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# **A study on the potential private sector investment priorities that support South Africa's climate change outcomes**

2018

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### National context and climate change response

The Global Risks Report 2018<sup>1</sup>, identifies ‘extreme weather events’, ‘natural disasters’ and ‘failure of climate-change mitigation and adaptation’ as three of the five global risks with the highest impact on the global economy.

While climate change affects all sectors of the South African economy and society, it is the poor who remain the most vulnerable in terms of extreme weather events, (such as droughts and floods), water scarcity and food security.

South Africa, with its resource-weighted economy, is still heavily reliant on coal-based energy generation, which means that the country continues to be a major emitter of global greenhouse gases (GHG), with emission that are 43 percent higher than the global average.<sup>2</sup>

The energy sector is the single largest contributor to the country’s total GHG emissions (81.7% in 2012). Despite the significant increase in renewable energy to the national energy mix from 2000 to 2012, the overall carbon intensity of the national energy system remained fairly constant.<sup>3</sup>

The South African government has committed to its shared responsibility for responding to climate change, through the ratification of the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and the Paris Agreement. In terms of South Africa’s Nationally Determined Contributions, South Africa has committed to a GHG emission trajectory that peaks between 2020 and 2025, plateau for approximately a decade (until 2035) and begin declining in absolute terms thereafter.

There is an urgent need to respond decisively and timeously to the impacts of (i) historic and future GHG emissions through sustained reduction efforts and (ii) building resilience to the impacts of climate change, whilst simultaneous growing the South African economy, reducing unemployment, poverty and income inequality.

South Africa has taken important steps towards implementing its national climate policy and has played a leading role in international climate negotiations<sup>2</sup>.

The Department of Environmental Affairs (DEA), other key national government departments and implementation partners (local and international) are intensifying their efforts towards the development, implementation and scaling-up of climate action in their respective sectors, through the Priority Climate Change Flagship Programmes.

#### Key messages:

1. “The Priority [Climate Change] Flagship Programmes are South Africa’s response to implementing climate action at scale and provide the greatest opportunity for attracting, mobilising and leveraging investment from both the private and public sectors towards South Africa’s Nationally Determined Contribution” (DEA, 2018).
2. However, some of the key challenges that need to be addressed in implementation these programmes, include:
  - 2.1. The development of robust programme level governance structures and the bolstering of climate change monitoring and evaluation.
  - 2.2. The need for a greater level of coordination and rigour in the development of concrete and detailed business plans for the implementation of national-scale climate action.
  - 2.3. Strengthening the institutional mechanisms for funding the Climate Change Flagship Programmes.
3. The private sector’s role in addressing the impacts of climate change should move beyond marketing or corporate social responsibility. The investment case for engaging with climate change and the SDGs is now more compelling than ever and those corporates who lead the way, have a greater chance of success.
4. The level of engagement and partnerships between government, the private sector (industry and financiers), academia and civil society should be intensified in order to find innovative solutions to persistent barriers (policy/regulatory, financial, capacity and market) that are preventing large scale private sector investment into projects that support South Africa’s NDC.

<sup>1</sup> World Economic Forum, Global Risks Report, 2018

<sup>2</sup> <https://www.giz.de/en/worldwide/17807.html>

<sup>3</sup> DEA, Tracking South Africa’s Nationally Determined Contributions, 2017

### Priority investment areas for the private sector in support of South Africa's NDC

The government's Climate Change Priority Flagship Programmes were used as the logical starting point for identifying potential high-impact investments or projects for mobilising and scaling private sector finance in support of South Africa's NDC.

Consideration was given to government-led climate actions as well as literature related to the private sector's climate change response and opportunities, such as the work done by organisations such as the National Business Initiative related to the green economy and the water sector and the Greencape's analysis of the energy efficiency, water and waste sectors.

An initial list of five sectors and 15 priority investment areas (projects /interventions) for the private sector was identified, based on a subjective evaluation of the following factors:

- Potential socio-economic development impact;
- Private sector investment drivers, such as, Revenue and/cashflow potential, public sector support (co-financing/incentives);
- Relative maturity of the sector or sub-sector and/or relative readiness to scale, in terms of:
  - Enabling environment and/or potential for reasonable progress towards an enabling environment;
  - Existing and/or emerging technologies, business models; and/or financing solutions
- High-level fit in terms of the GCF investment criteria and results areas; and
- Potential for using de-risking financial instruments to catalyse the investment.

The prioritised sectors and related projects for mobilising and scaling private sector funding are shown in the table below.

It is acknowledged that other sectors, not included in the below list, may well offer significant potential for private sector investment, for example the transport sector. The author also recognises the interconnectedness between sectors with respect to cross-cutting climate action, for example building

low-carbon climate resilient cities, require integration across multiple sectors, such as energy (renewable energy and energy efficiency), waste, water and sustainable transport systems and infrastructure, amongst other.

#### Key messages:

5. The analysis provides a preliminary base for a comprehensive evaluation of each of the private sector opportunities. This will ultimately inform the prioritisation of the short-listed projects for implementation and GCF funding support.
6. In order to build on the findings of this study, additional work is required in order to:
  - 6.1. Develop a deeper understanding of the evolving business models and innovative financing mechanisms being explored and developed within the identified priority investment areas. This may take the form of detailed case studies.
  - 6.2. Evaluate the effectiveness of existing partnerships and engagement between sector-based government departments and the private-sector developers and financiers, with a view to strengthening existing arrangement and/or establishing new commitments on the scaling of low carbon, climate resilient investments in the priority sectors.
  - 6.3. Evaluate the effectiveness of the GCF readiness preparatory support programmes in strengthening the National Designated Authority (DEA) and regional, national and local entities, to oversee and implement climate change projects and related climate finance in the priority investment areas.
  - 6.4. Evaluate the effectiveness of existing project preparation support programmes and address issues related to lack of capacity and skill development and transfer. One of the key issues is that the existing support programmes fail to address the long-term nature of skills development and skills transfer.
  - 6.5. Assess local options for simplifying and speeding-up access to GCF funding in the priority investment areas, specifically enhancing the role of the four major commercial banks in supporting South Africa's NDC.

Sector	Subsector/ sub-category	Projects / Investment Areas
<b>1. Energy</b>	Energy Efficiency	1. Energy Efficiency in Public Infrastructure and Buildings
		2. Energy Efficiency Private sector (industrial/commercial) and Households
	Energy Generation	3. Small Scale Embedded Generation
		4. Renewable energy based on Non-sovereign-backed Power Purchase Agreements
<b>2. Waste</b>	Waste to Energy	5. Waste to Energy (Biogas/Incineration)
	Waste Diversion/recycling	6. Diversion of solid waste from Landfil / Material Separation Facilities/at source
<b>3. Water</b>	Water resource development	7. Renewable Energy desalination plants (seawater, brackish water/other)
	Water infrastructure operations, maintenance and rehabilitation	8. Public Private Partnership (PPP) to rehabilitate, operate and maintain public water infrastructure
	Water Harvesting	9. Commercial/Industrial water harvesting
	Wastewater treatment and Wastewater to energy	10. Industrial water reuse, recycling and recovery
11. Wastewater Biogas to electricity		
<b>4. Agriculture, Food Systems and Food Security</b>	Climate Smart Agriculture (incorporating weather, water, seeds/varieties, nutrients/markets)	12. Conservation Agriculture (Climate Smart Agriculture)
		13. Controlled Environment Agriculture/Precision Agriculture (Greentech/ICT solutions) (Energy Efficiency/Renewables (Irrigation, Packhouses, cold stores/cellars) (Water Efficiency)
	Agri-Processing, productions and related foods systems	14. Agri-parks (agri-production and agri-processing) and Special Economic Zones (SEZ) for Greentech
<b>5. Low Carbon Climate Resilient Built Environment and Human Settlements</b>	Green buildings / Human settlements / Infrastructure	15. Green buildings for social, low-income housing (RE/EE, Water and Waste Management, sustainable building materials).

### Innovative climate finance mechanisms for catalysing private sector funding

The importance of private sector funding in achieving national climate change response actions is recognised in the National Climate Change Response Policy (NCCRP). However, appropriate and innovative climate finance mechanisms are required to catalyse and scale private sector finance for low-carbon climate-resilient development.

A review of selected innovative climate finance mechanisms and/or concepts, has revealed the following emerging themes:

- Use of market aggregator mechanism to create scale, pool risk, reduce costs and improve project viability.
- Funding solutions that address the upfront infrastructure finance gap, by introducing credit-worthy third-party owners and or operators of infrastructure who, in turn, enter into long-term contracts with end-users.
- Risk transfer / reduction through the use of guarantees or appropriate risk allocation between the parties, which improves the risk-return profile of the investment and encourages private sector to investment.
- Blending of finance using a phased approach that apply concessional finance to initial, more risky pilot projects, with scaled-up, follow-on investments that target commercial co-finance from private sector, once the concept is proven.
- Use of technology to drive operational efficiencies and improve viability of investments.
- Introduction of financial and non-financial incentives (e.g. training, access to networks or experience) to stimulate investment into alternative low-carbon investment options.

### Options for targeting standalone climate projects that seek private sector investment

The following are some high-level options for targeting large standalone climate change projects involving the private sector:

- Establish a South African Climate Finance Lab, similar to the Brazil Lab or India Lab, which serves as a mechanism for identifying and incubating standalone high-impact, transformative projects.

- Request for proposals (RFP) by local Accredited Entities (AE) and the major local commercial banks in partnership with AEs, with targeted funding windows, based on either (i) specific GCF results areas (ii) type of funding support required based on stage/maturity of project.
- Sustained capacity building with respect to project development, project finance and project implementation, especially at the sub-national level (municipalities, local project developers and financial institutions), including enabling environment support, policy advocacy and technical assistance including understanding the role of Executing Entities under the GCF.
- Incentives for commercial banks to innovate and scale funding for specific sector-based green projects (e.g. Energy Efficiency, Climate Smart Agriculture, Green Buildings, Social Sustainable Housing), through co-finance and/or outcomes-based grants and highly concessional loans for a specified period to support the building of the respective markets.

#### Key messages:

7. Blended finance has a potentially significant role to play in crowding in private sector finance at scale, especially in respect of low-carbon infrastructure projects (such as water infrastructure) or nascent green-tech industries where there is a need to support the development of new low-carbon markets or technologies.
8. Green bonds offer a significant opportunity (especially at provincial and municipal level) to mobilise large amounts of private capital earmarked for low-carbon, climate resilient investments. The global green bond market is expected to grow exponentially as governments, cities, municipalities and large corporates seek funding to meet climate change commitments and SDG.
9. Green performance-based grant funds (outcomes-based grant funds) could offer private sector institutional investors the opportunity to increase investment in green Small Medium and Micro-Enterprises (SMMEs), by paying for pre-agreed green outcomes, such as (amongst others) green job creation, climate change mitigation and improved water and waste management, subject to matching private sector funding from these private sector institutional investors. An evolution of this performance-based model, could see grants being replaced by concessional or blended finance instruments.



### Project background and objectives

The Green Climate Fund (GCF) aims to mobilize private sector investment at scale in activities that are central to a developing country's climate change objectives. Paragraph 41 of the GCF's Governing Instrument (read in conjunction with paragraphs 42 to 44) states that the Fund's Private Sector Facility enables it to directly and indirectly finance private sector mitigation and adaptation activities at the national, regional and international levels.

The purpose of the study is to identify potential innovative, high-impact interventions, programmes and/or projects relevant to South Africa's Nationally Determined Contribution (NDC) and for which:

- i. Private sector investment is most accessible; and
- ii. GCF funding support is an essential catalyst for leveraging additional finance.

This study also aims to examine:

- i. The approach to and scope for sectoral programmes and/or interventions that underpin South Africa's National Climate Change Response, including types of activities and financial instruments that demonstrate the use of the GCF's concessionality for the private sector;
- i. Priorities for investment in mitigation and adaptation projects /programmes for the Private Sector that are aligned to GCF results areas;
- ii. Options to encourage and target stand-alone climate projects (focused on private sector participation) for submission to the GCF; and
- iii. Institutional approaches that aim to support the preparation of high-quality, transformative investments in South Africa that are able to access concessional climate finance.

The underlying assumption is that this study will contribute to the ongoing effort to better understand the extent of and/or potential opportunities for mobilising private finance at scale in projects or programmes that support country-specific NDC. By understanding the potential for large scale, high-impact investments and innovative approaches to stimulating private-sector co-investment, this report should be viewed as an initial attempt to bridge the information gap that exists between public and private sector actors. Where possible, this study seeks to build on the existing body of knowledge pertaining to the mobilisation of private sector finance for climate change action, and to provide broad recommendations to enhance the effort to mobilise private sector finance at scale through leveraging the concessionality of the GCF's financial instruments within South Africa.

Further discussion, analysis and experimentation will be required to determine the merits and limitations of the recommendations, or to identify the most appropriate strategies, approaches and mechanisms specific to South Africa in order to stimulate and scale private sector investment that support South Africa's NDC and those of its regional neighbours.

### Context of the study

The Southern Africa Climate Finance Partnership (SACFP) supports Southern African countries in improving their country-owned climate investment portfolios. It looks to support collaborative country programming to sequence investment into ambitious low carbon, climate resilient portfolios within Southern Africa. These investment portfolios should be able to access the GCF and other climate finance sources, and, where possible, mobilise private investment at scale.

SouthSouthNorth (SSN) has received funding from the Swiss Agency for Development Cooperation (SDC) to support the Government of South Africa in relation to their GCF country programming and to advance "business unusual" thinking within South Africa. With this in mind, SSN has commissioned this independent scoping study on potential private sector investment priorities in South Africa. The objective of this exercise is to identify possible high-impact private sector investments that may benefit from GCF funding. The scoping study aims to complement the work carried out by SSN in relation to the SACFP in other Southern Africa countries that is supported by the United Kingdom's Department for International Development.

### Scope of work

The study will seek to identify:

- a. The approach and scope for sectoral interventions, including types of activities and corresponding financial instruments that demonstrate the use of the GCF's concessionality for the private sector;
- b. Identifying the priorities for GCF investment in climate projects/programmes based on analysis and evidence around GCF results areas, and where the GCF can add most value and support based on the existing GCF investment criteria and possible future eligibility criteria, including on incremental cost.
- c. Identify an institutional approach to support the preparation of high quality, transformative investments in South Africa that can access the GCF and other multilateral sources of climate finance.
  - i. Best practice and lessons from innovative mechanisms to promote climate finance that could be replicated in South Africa and Southern Africa.
- d. Outlining how the NDA can encourage and target climate projects for submission to GCF.
- e. In relation to the identification of specific interventions, the study will:
  - i. Identify three to five sectors and/or sub-sectors<sup>4</sup> suitable for private sector investment; and
  - ii. Provide a high-level assessment of the:
    - scale of investment opportunities (considering what others are doing/planning to fund already)
    - risks and barriers to investment (i.e. what are the key barriers including the various types of risks, any technology barriers, lack of capacity etc.)
    - nature of GCF funding that would facilitate mobilising private sector funding at scale.

### Limitations

The limitations of the assignment, combined with the broad scope and wide spectrum of public and private sector literature and actors, implied that the information and analysis of the priority private sector investment areas, remained relatively superficial at this stage. This also applies to the emerging and rapidly evolving climate finance landscape. Further steps can be taken with respect to the selected short-listed priority projects or programmes for the private sector in order to further explore the emerging business models and related climate finance solutions through detailed case studies.

### Boundaries of the study

The study is restricted by the following boundaries, which should be noted when interpreting the study's results:

- **Geographical scope:** The focus is on South Africa's climate change priorities and the scope for scaling private sector investment and funding that supports South Africa's NDC. International low-carbon interventions or related finance mechanisms are only included in the study in so far as these are relevant to South Africa's climate change priorities and or context.
- **Type of interventions:** The analysis is focused on low carbon climate resilient interventions, programmes and or projects (cross-cutting) and finance mechanisms that seeks to leverage concessional climate finance.
- **Type of Actors:** The analysis is centered largely on activities of the public sector (Government) to catalyse and scale private sector investment in low carbon, climate resilient projects. The activities led by private sector actors in this area, are included to the extent identifiable from the literature review and interviews.

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<sup>4</sup> For purposes of this report, distinction between sector and sub-sector is loosely applied and is demonstrated by means of an example: 'Energy' is considered to be a sector, while 'Renewable Energy' or 'Energy Efficiency' is considered to be a sub-sector of the Energy sector.

### Approach and methodology

The content of this study is intended for general information purposes. As such, the information presented in this report is predominantly based on secondary data obtained from both primary and secondary sources.

The study utilises two research techniques, a literature or desk-based review and semi-structured interviews with selected stakeholders. The literature review serves as the primary research technique, with interviews serving as a secondary/supporting technique. Refer to Annexure A for a more detailed outline of the approach and methodology.

The study draws extensively from the literature on South Africa's national climate change response policy, related annual and biennial reports, National Development Plan (NDP 2030), draft National Adaptation Strategy (NAS) and National Sustainable Development Action Plan (NSSD1). Publicly available literature/studies on sector-based climate change mitigation and adaptation strategies and actions, local and international climate finance approaches and instruments used to mobilise private sector finance, as well as studies on public and private sector barriers to accessing climate finance were considered. Relevant websites and related content believed to be credible and reliable, were also considered.

The author conducted limited interviews<sup>5</sup> with personnel from the Department of Environmental Affairs; Development Bank of South Africa (DBSA) and the Industrial Development Corporation (IDC) and South African Biodiversity Institute (SANBI).

Limited interviews were also conducted with selected private sector representatives, from:

- Institutional investor community;
- Local Commercial Banks;
- Research and/or academic institutions; and
- Business associations.

### Structure of the study findings

The study findings have been structured as follows:

1. Mapping of South Africa's national development and climate change landscape, starting with an overview of South Africa's national context (socio-economic development and climate change response) and the policy frameworks and related policy documents.
2. Overview of the Near-term Priority Flagship Programmes for scaling climate action in South Africa.
3. Information and analysis on national Public Environmental Expenditure, followed by an overview of climate finance in South Africa. A summary is provided of a study on estimating publicly-mobilised private finance for climate action in South Africa, followed by key barriers to accessing climate finance.
4. Overview of innovative climate finance mechanisms and trends locally and globally, giving a high-level macro perspective on merging climate finance mechanisms that are potentially relevant to South Africa.
5. Identification of priority sectors and investment areas in South Africa, for mobilising private sector finance and mapping these priority investment areas against the GCF results areas and investment criteria, including possible access modalities and GCF support areas. A summary of the key barriers related to the respective private sector priority investment areas are also provided.
6. The report concludes with a preliminary list of priority investment areas or projects for private sector investment, and observations from emerging innovative climate finance mechanisms. Finally, options for targeting large standalone projects that seek concessional climate finance, are provided, as well as recommended next steps.

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<sup>5</sup> It is noted that, due to time constraints, most of the interviews conducted (both public sector and private sector) were introductory in nature, characterised by one meeting or phone call with a single individual. As a result, the content of the report is drawn largely from information gathered during the literature review. Refer to Annexure F for a list of the individuals interviewed.

### National context and climate change Response

South Africa is a contributor to global climate change with greenhouse gas (GHG) emissions resulting from mainly energy production and consumption. The energy intensity of the South African economy has resulted in an emissions profile that differs substantially from that of other developing countries at a similar stage of development. This is largely due to the significance of mining and minerals processing in the economy and coal-intensive energy system. As the largest economy in the Southern African Development Community (SADC), adverse climate change effects on the country will impact on the region as a whole.<sup>6</sup>

“South Africa faces the challenge of climate change as a developing country, with overriding priorities to eliminate poverty and eradicate inequality. Eliminating poverty and eradicating inequality requires addressing major challenges in creating decent employment, which in turn requires sustainable economic development, improving basic education, health and social welfare and many other basic needs such as access to food, shelter and modern energy services.”<sup>7</sup>

South Africa therefore has the [difficult] task of balancing the acceleration of economic growth and transformation with the sustainable use of environmental resources and responding to climate change.<sup>8</sup>

The National Development Plan (NDP) 2030 was adopted by the Cabinet in 2012 and represents South Africa’s long-term plan for eliminating poverty and reducing inequality by the year 2030, based on the best use of limited resources. Its objectives are integrated into a range of short and medium-term policy planning documents such as The Medium-Term Strategic Framework (MTSF), The Industrial Policy and Action Plan (IPAP) and the nine-point plan.<sup>9</sup>

The NDP 2030 recognises the importance of partnerships between government, private sector and civil society in order to drive business confidence, achieve rising levels of investment, creating more decent employment, higher productivity and growing income levels. While the NDP 2030 acknowledges the many roles for the private sector in supporting the government’s socio-economic objectives, the following roles were highlighted by the then Minister of Finance, Mr Nhlanhla Nene, in an address to the Old Mutual Board on 31 July 2014<sup>10</sup>:

1. The private sector’s role in financing infrastructure, including bulk infrastructure – National Treasury has initiated a Task Team on Private Sector Financing of Infrastructure, aimed at identifying and removing blockages to private sector financing.
2. The private sector’s role as a partner in addressing legislative and policy bottlenecks, including policy design and implementation.
3. The private sector’s role in determining fair and equitable wages in the private sector.

South Africa’s NDP 2030 is committed to a low carbon, climate resilient future, while the National Climate Change Response Policy (NCCRP) provides a strategic roadmap to achieve this. These policies present government’s vision and strategy for an effective response to climate change over the short, medium and long-term, while simultaneously working towards inclusive economic growth, poverty alleviation and increased employment.

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<sup>6</sup> DEA, Biennial Update Report 1, 2014

<sup>7</sup> INDC, 2015

<sup>8</sup> DEA, 2<sup>nd</sup> CCAR, 2016

<sup>9</sup> Refer to Annexure B for details related to these policy documents, including the National Climate Change Response Policy

<sup>10</sup> Minister of Finance, Nhlanhla Nene, “The role of the private sector in implementing the National Development Plan”, 31 July 2014

According to the National Water Resource Strategy<sup>11</sup>, water is the primary medium through which the impacts of climate change (i.e. more-intense storms, floods and droughts; changes in soil moisture and runoff; and the effects of increasing evaporation and changing temperatures on aquatic systems) are being felt in South Africa. This results in increases in climate variability and climatic extremes impacting both water quality and availability through changes in rainfall patterns. South Africa has been experiencing a serious drought since 2015, with associated crop losses, water restrictions, and impacts on food and water security<sup>6</sup>. Climate change therefore poses a significant threat to South Africa's water resources, food security, health, infrastructure, ecosystem services and biodiversity.

Work, to address the impact and causes of climate change (through mitigation and adaptation measures), is well under way in a number of national, provincial and local government departments. This work is taking place at the policy, planning and implementation levels.

Following extensive consultation processes across all 9 provinces, which involved representatives from government, research/academia, civil society and the private sector, the South African Government submitted its own Intended Nationally Determined Contribution<sup>12</sup> (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat in September 2015, which are now referred to as National Determined Contributions (NDC), following South Africa's ratification of the Paris Agreement during 2016.

South Africa's mitigation contribution takes the form of a peak, plateau and decline profile, with GHG emissions expected to peak (2025), plateau (2025-2035) and decline (2035 onwards). This profile acknowledges South Africa's dependence on coal-based energy for the short to medium term, as well as the need to achieve positive socio-economic transformation for the majority of its people. This NDC mitigation contribution is expressed in terms of a GHG emissions trajectory range of 398 to 614 Mt CO<sub>2</sub>e. South Africa has thus committed to reduce GHG emissions below "business as usual" by 34 per cent by 2020 and 42 per cent by 2025.

A strong bilateral partnership on Climate Change has developed between the South African Government and the German Government, via the Climate Support Programme (CSP). With the support of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, has assisted the South African Department of Environmental Affairs (DEA) to develop South Africa's National Climate Change Response Policy and this assistance is now focused on implementation of this policy. GIZ is (and has been) advising the DEA on scientific analysis, policy development and consensus building<sup>13</sup>, which has enabled South Africa to create a solid foundation on which to design and implement its climate change response.

The South African government has and continues to leverage the support of the CSP, the private sector and research institutions (amongst other), to:

- **Design and implement South Africa's National Mitigation System by:**
  - Identifying and determining the mitigation potential in key sectors of the economy, such as Energy, Industry and Transport.
  - Setting and approving Sector Emissions Targets (SET) for relevant national sector departments and calculating carbon budgets for more than 30 large South African companies.
  - producing research findings, which have fed into the National Climate Change Response Policy (NCCRP), published in 2011.

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<sup>11</sup> DWA, 2013

<sup>12</sup> Refer to Annexure B for further details on South Africa's INDC mitigation and adaptation commitments.

<sup>13</sup> <https://www.giz.de/en/worldwide/17807.html>

- **Develop South Africa’s National Adaptation Strategy (NAS), which is currently in draft form, by:**
  - Assessing the level of vulnerability of key economic and social sectors to climate change.
  - Completing cross sectoral research projects and developing Long-Term Adaptation Scenarios (LTAS) that have and are being fed into sectoral and provincial adaptation strategies and adaptation plans.
  - Developing climate responsive development plans for local authorities/municipalities and developing support tools, such as “Let’s Respond Toolkit”.

The South African government has also recognised the importance of private sector funding in achieving national climate change response actions and the importance of collaborating with the financial sector to explore the most appropriate mechanisms to achieve efficient funding flows for low-carbon climate-resilient development. Business and industry have already contributed to the development of the National Greenhouse Gas Inventory by voluntarily submitting GHG data to Government.<sup>14</sup>

According to the National Business Initiative<sup>15</sup> (NBI), the scale of climate-related impacts [from a private sector business perspective] is supported by CDP Climate Change data<sup>16</sup>, which indicates that around 95% of participating South African companies see risks associated with climate change as highly likely to materialise within the next three years [from 2017]. These risks include (amongst others) water security (shortages and drought), an increased frequency and severity of floods, an increased frequency of extreme weather events, rising food insecurity, public health problems and damage to infrastructure and ecosystems, all of which have the potential to affect business sustainability.

The NBI highlights<sup>17</sup> that these various climate change impacts are felt [by private sector/business] in four key reported areas, as follows:

1. Concerns related to the decreased availability of raw materials, particularly in relation to agriculture, forestry and fisheries.
2. Risks to physical assets, including ports, pipelines, communication networks, mine infrastructure, transportation networks and electricity supply, as well as associated rising insurance costs.
3. The interruption of operations, particularly in relation to logistics, shipping, oil and gas, chemicals and retail environments.
4. The health and safety of employees and communities, including in relation to extreme weather events, fatigue related accidents and changes in disease vectors.

The NBI also notes that leading South African businesses are integrating adaptation planning into their existing risk management processes and supply chains. These organisations are using robust data and partnerships with peers, public sector and civil society to develop clear adaptation strategies in order to address the risk of climate change.

Despite South Africa’s progress from a climate change policy and strategy perspective, many challenges exist that are slowing the rate of progress (particularly capacity to develop and implement projects at scale). Implementation of climate change policy, by its nature, is cross-cutting in terms of mandates, sectors and geographies, making implementation complex.

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<sup>14</sup> NCCRP, 2011

<sup>15</sup> NBI, A New Climate of Risk: How South African businesses are adapting to Climate Change, 2017

<sup>16</sup> CDP is a not-for-profit organisation and holds the largest collection, globally, of self-reported climate change, water and forest-risk data.

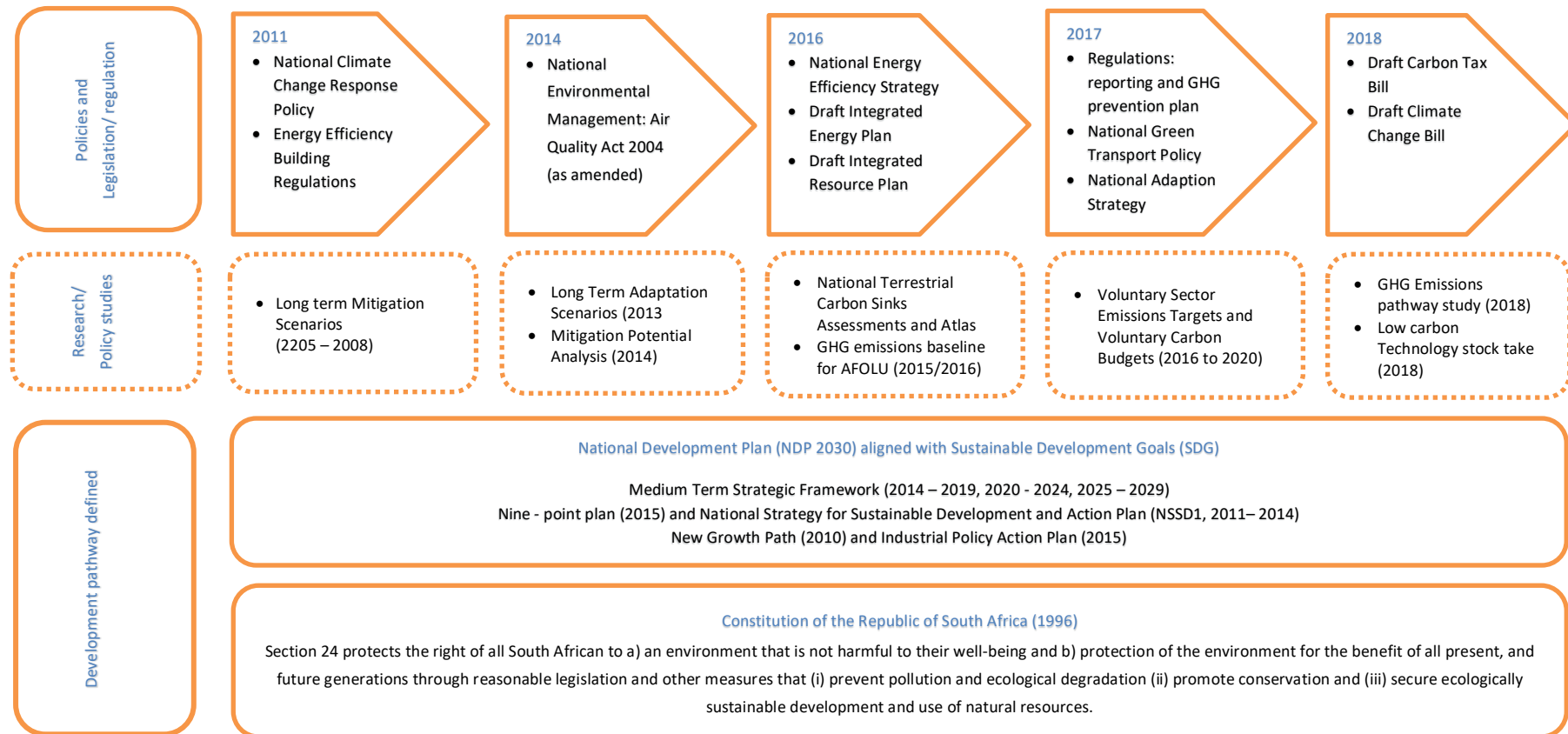
<sup>17</sup> NBI, A New Climate of Risk: How South African businesses are adapting to Climate Change, 2017

Greater coordination and communication across the three spheres of government, across different departments and sectors; as well as stronger partnerships between public and private institutions (industry, investors, academia and civil society) and targeted capacity building, will strongly influence South Africa's rate of success in effectively addressing climate change.

Further detail on South Africa's key policies and strategies related to climate change and socio-economic development, is provided in Annexure B.

Snapshot of South Africa’s climate change policy framework

South Africa’s climate compatible development pathway is underpinned by the constitution, envisioned in the NDP (2030) and aligned to the UN Sustainable Development Goals (SDG). The NCCRP provides a national roadmap for a transition to a low-carbon, climate resilient economy in the context of the NDP 2030 and South Africa’s National Strategy for Sustainable Development. Below is a high-level representation of South Africa’s Climate Change Policy Framework.<sup>18</sup>



<sup>18</sup> Adapted from DEA/NBI, 2017/2018.



## National Climate Change Response Policy

South Africa's NCCRS<sup>19</sup> has two broad objectives:

1. Manage the impacts of climate change by building and sustaining South Africa's social, economic and environmental resilience.

2. Contribute to the global effort to stabilise global emissions (GHG), while simultaneously enabling sustainable economic, social and environmental development.

More specifically, the policy seeks to:

- Set the national emission reduction trajectory range and goals;
- Provide for the regulatory framework for the national emission reduction cycle, including mandatory planning and reporting,
- Provide for incentives to support South Africa's national emission reduction efforts;
- Set the national adaptation goals;
- Provide for the regulatory framework for the national adaptation cycle, including mandatory planning and reporting; and
- Provide for alignment of relevant national sectoral legislation, as well as relevant provincial and local legislation with climate change response objectives.

## Mitigation

In terms of the NCCRP, South Africa has committed to "reducing its GHG emissions by 34% below Business as Usual (BAU) before 2020, and by 42% below BAU by 2025". In order to achieve such reductions, relevant policies, robust frameworks, financial resources, technology sharing/ transfer and strong partnerships, as well as capacity building, are needed.

Key elements of the mitigation approach<sup>20</sup>:

- Build on what already exists;
- Assess mitigation potential in key sectors and identify viable options for reducing GHGs in key sectors;
- Assess socio-economic costs /benefits of mitigation opportunities;
- Based on above, define Sector Emissions Targets (SET), previously known as desired emission reduction outcomes or DEROs;
- Agree on the optimal combination of measures, appropriate to each sector, to achieve the SETs (including the carbon tax, carbon budgeting approach, setting of efficiency targets, use of standards and regulation);
- Sectors / sub-sectors to formulate mitigation plans, to achieve SETs; and
- Monitoring and evaluation.

<sup>19</sup> The NCCRP was approved in October 2011 and was formally published as a White Paper in the Government Gazette (No. 34695, Notice No. 757)

<sup>20</sup> DEA, 2013

In 2015, Cabinet approved South Africa’s Climate Change Mitigation System framework, based on the above elements. The system would be introduced in two phases. Phase one (2016-2020) would be voluntary, while Phase two and subsequent phases (post-2020 period) would become mandatory, once climate change response legislation was in place.

Key mitigation policy instruments being developed by the South African government are:

Flagship Programmes	Mitigation potential analysis	Sector Emissions Targets (SET)	Carbon Tax
<ul style="list-style-type: none"> <li>• Focus on major emitting sectors and key adaptation sectors</li> <li>• Well-known mitigation outcomes and implementation processes</li> <li>• Cost-effective with significant co-benefits, or have technology-development benefits</li> </ul>	<ul style="list-style-type: none"> <li>• Identify mitigation options in South Africa’s key economic sectors. (energy, industry, transport, waste, and agriculture, forestry and other land use)</li> <li>• Project national GHG emissions to 2050</li> </ul>	<ul style="list-style-type: none"> <li>• Define SETs for each significant sector or sub-sectors,</li> <li>• Introduce carbon budgets and regulations/standards for significant emitters</li> <li>• Assessment of the mitigation potential and options using science and evidence</li> <li>• Costs vs. benefits</li> </ul>	<ul style="list-style-type: none"> <li>• Pricing carbon is key to driving a transition to a green economy</li> <li>• Need to assess impacts in terms of GHG Inventory and economic growth;</li> <li>• Need for binding legislation by 2020, when compliance becomes mandatory</li> </ul>

Private sector mitigation initiatives have been predominantly geared toward energy efficiency, demand management, and moving towards a less emissions-intensive energy mix.<sup>21</sup> The Carbon Disclosure Project (CDP)<sup>22</sup>, is a key voluntary initiative supported by the private sector that seeks to establish credibility, enhance transparency in reporting data, reduce risks, save costs, and ultimately reduce emissions.

<sup>21</sup> DEA, 1<sup>st</sup> BUR, 2014

<sup>22</sup> Further details are provided in Annexure B.

*Typical high-level mitigation response measures per sector and related policy instruments*

An overview of the typical climate change mitigation measures and key policy instruments per sector.

Sector	Typical measures	Policy instruments
Energy (including energy related transport)	<ul style="list-style-type: none"> <li>• Provide financial support for mitigation actions in energy sector</li> <li>• Diversify electricity generation sources</li> <li>• Diversify liquid fuel sources</li> <li>• Facilitate carbon capture and storage</li> <li>• Facilitate energy efficiency</li> <li>• Reduce emissions in transport sector</li> <li>• Reduce coal bed methane</li> </ul>	<ul style="list-style-type: none"> <li>• National Energy Efficiency Strategy (NEES)</li> <li>• DRAFT Integrated Resource Plan (IRP) 2018</li> <li>• Energy Efficiency Eskom- Integrated Demand Side Management Programme (IDM)</li> <li>• Municipal Energy Efficiency and Demand Side Management, 2004-2014</li> <li>• White Paper on the Renewable Energy Policy of the Republic of South Africa, 2003</li> <li>• National Transport Master Plan (NATMAP 2050)</li> <li>• National Industrial Biofuels Strategy (NIBS)</li> </ul>
Waste	<ul style="list-style-type: none"> <li>• Encourage the practices of recycle and reuse</li> <li>• Introduce new technologies and processes to reduce emissions</li> <li>• Encourage energy recovery from waste sources.</li> </ul>	<ul style="list-style-type: none"> <li>• White Paper on Integrated Pollution and Waste Management, 2007</li> <li>• National Waste Management Strategy 2011</li> <li>• Green Fund Programme on Waste Management</li> </ul>
IPPU	<ul style="list-style-type: none"> <li>• Fuel switching</li> <li>• Upgrading plant and equipment</li> <li>• Introducing new technologies</li> <li>• Reducing nitrous oxide emissions</li> <li>• Capturing perfluorocarbons in aluminium plants and</li> <li>• Developing other emission reduction activities in the private sector</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial Policy and Action Plan, 2012/13-2014/15</li> <li>• National Waste Management Strategy, 2011</li> <li>• Department of Trade and Industry's Incentive Schemes 2005</li> <li>• Industrial Feed &amp; Fuel Switch: CNG Industry Fuel Switch</li> </ul>
AFOLU	<ul style="list-style-type: none"> <li>• Reduce emissions in the agricultural sector</li> <li>• Develop carbon sinks</li> </ul>	<ul style="list-style-type: none"> <li>• National Terrestrial Carbon Sinks Report</li> <li>• White Paper on Sustainable Forest Development in South Africa, 1997</li> <li>• The National Forests Act, No. 84, 1998</li> <li>• Long Term Mitigation Scenarios</li> </ul>

Details related to the key sector-based mitigation interventions are provided in Annexure D.<sup>23</sup>

<sup>23</sup> The sector categories differ from the IPCC categories and include the thematic area, the name of policy/instrument/strategy/action, description of the mitigation action, status, and co-benefits.

## Adaptation

South Africa's 2<sup>nd</sup> draft National Adaptation Strategy (NAS) was issued for comment in October 2017. According to the draft NAS, the overall vision is "to transition to a climate-resilient South Africa, which will follow a development path, guided by anticipation, adaptation and recovery to a changing climate and environment to achieve our development aspirations".

The draft NAS is the overarching guidance on climate change adaptation for South Africa and encourages stronger integration and coordination (in terms of planning, implementation and reporting) between sectoral institutions, provincial and local governments, non-governmental entities, the private sector and civil society.

The following high-level sector-based implementation priorities have been identified in the draft NAS:

Sector	Description
Water	<ul style="list-style-type: none"> <li>Define and identify priority areas for Ecosystem-based Approach (EbA) through a collaborative effort with DEA, DRDLR, DAFF for 2019 MTSF.</li> <li>Scale up of Working for Water through international funding.</li> <li>Define Flagship Programmes for implementation, covering both water quantity and quality for 1st NAS.</li> <li>Collaboration with the National Disaster Management Centre (NDMC) and development of an early warning system of variable time-frames.</li> </ul>
Agriculture	<ul style="list-style-type: none"> <li>Define Flagship Projects to address key vulnerabilities for inclusion in the 2019 MTSF.</li> <li>Develop Disaster Risk Reduction Strategy and Instruments for the agricultural sector in 2020.</li> <li>Develop a platform for a seasonal forecast based on national crop estimates, including subsistence farmers.</li> </ul>
Fisheries	<ul style="list-style-type: none"> <li>Address key vulnerabilities through Flagship Projects, in particular aquaculture as part of Operation Phakisa.</li> <li>Develop Disaster Risk Reduction Strategy and Instruments for the fisheries sector in 2020.</li> <li>Develop an early warning system for the fisheries sector, including algal bloom incidence.</li> </ul>
Forestry	<ul style="list-style-type: none"> <li>Address key vulnerabilities through the scaling-up of Working on Forests and Working on Fire. Develop Disaster Risk Reduction Strategy and Instruments for the forestry in 2020. Develop an early warning system for the forestry sector, including incidence of fire. Adoption of EbA approached to landscape management</li> </ul>
Biodiversity and ecosystems	<ul style="list-style-type: none"> <li>The primary activity for this sector is the development and further operationalization of EbA Programme on multifunctional landscapes with relevant players such as Local Government, DAFF, DRDLR in the period of the 1st NAS.</li> </ul>
Human settlements	<ul style="list-style-type: none"> <li>The development of Guidelines for Climate Change Resilience, through updates of the National Disaster Management Framework (DMF), Spatial Development Framework (SDF), and Building Code by 2020.</li> <li>Implement the Disaster Risk Reduction and Management provisions, scaling up where appropriate.</li> <li>Develop targets with regards to provision of basic services such as water in light of climate change and implement service delivery projects.</li> </ul>
Health	<ul style="list-style-type: none"> <li>Co-design and implementation with the DAFF a Food Security and Health Flagship.</li> <li>Implement health related aspects of the Disaster Management Framework.</li> <li>Design a project to implement a programme for managing vector borne diseases.</li> </ul>

Sector	Description
	<ul style="list-style-type: none"> <li>In association with local government implement projects related to air pollution and water services, sanitation, refuse removal.</li> <li>Publish resilience standards for health care infrastructure planning, design, and operation.</li> </ul>
Disaster management	<ul style="list-style-type: none"> <li>Resourcing and operationalization of the Disaster Management Framework.</li> <li>Explore consolidation of Disaster Relief funds across government sector, such as agriculture, health.</li> <li>Expand the early-warning network, including agricultural disasters, health disasters, etc.</li> </ul>
Mining and extractives	<ul style="list-style-type: none"> <li>Develop a Flagship Programme co-funded by the public-private sector for resilience in the mining sector.</li> <li>Develop and early -warning system for climate related disasters in the mining sector.</li> <li>Contribute to the Biodiversity and Ecosystem Flagship on EbA and multifunctional landscapes</li> </ul>
Energy	<ul style="list-style-type: none"> <li>Include adaptation considerations into the next iteration of the IRP with outputs of the Climate Change Strategy.</li> <li>Resource and support the implementation of resilience measure by ESKOM and IPPs.</li> </ul>
Transportation and public infrastructure	<ul style="list-style-type: none"> <li>Develop and implement a Transport Sector Flagship Programme covering port, rail and road sectors;</li> <li>Develop a building infrastructure Flagship with the Green Building Council of South Africa; and</li> <li>Support implementation of the Disaster Relief efforts for the sector</li> </ul>

#### *SANBI - National Implementing Entity for the Adaptation Fund and GCF*

The South African National Biodiversity Institute (SANBI) was accredited to the Adaptation Fund in September 2011, as South Africa's National Implementing Entity (NIE). Following the finalisation of the NIE's Investment Framework in November 2012, SANBI issued a call for proposals, resulting in over 70 concept proposals being received. Two project clusters, which were selected for further development, was approved (as pilot projects) for funding in October 2014, namely:

- The uMngeni Resilience Project:** This project is aimed at increasing the resilience of vulnerable communities in the uMngeni River catchment (KwaZulu-Natal). The pilot includes implementing climate smart agriculture, climate proofing settlements, investment in ecological infrastructure and installation of early warning systems, using near real-time weather stations and community monitors. The project budget is approximately 7.5 million US Dollars.
- Community Adaptation Small Grants Facility:** The project is being implemented in the Mopani District in Limpopo Province, and the Namakwa District in the Northern Cape. It was designed to support 12 small grants of approximately 100 000 US Dollars each. The fund released small grants so that communities could run projects that delivered tangible and sustainable benefits. The total value of the project is approximately 2.5 million US Dollars

SANBI became an Accredited Entity for the Green Climate Fund in October 2016 and issued a call for proposals for adaptation projects during 2018, resulting in more than 125 expressions of interest being received. Furthermore, SANBI is currently collaborating with partners, such as the NBI, to develop a pipeline of transformative adaptation projects aligned to South Africa's national climate change response. It is noted SANBI's GCF accreditation is restricted to grant funding only.

In addition to the mitigation and adaptation response articulated in the NCCRP, the following related elements are also highlighted in the policy:

- **Monitoring and evaluation (M&E)**
  - Developing framework for M&E of mitigation outcomes (in terms of specific and collective actions), by building on existing reporting systems.
  - Establishing a monitoring system and framework for gathering information and reporting progress on the implementation of adaptation actions, and to assess the effectiveness of adaptation responses.
  - Monitoring and evaluating the effectiveness of the implementation of Near-term Priority Flagship Programmes using an annual reporting process.
- **Resource mobilisation**
  - Promoting, supporting and securing resources (financial, science and technology, human) for climate change and green economy interventions.
  - Designing, developing and rolling-out a climate change education and awareness campaigns.

Further detail on resource mobilisation is provided in the section titled “Overview of climate finance in South Africa”

#### Institutional arrangements

The below table sets out the domestic institutional arrangement that South Africa currently has in place to address climate change response actions.<sup>24</sup>

Structure	Function
Parliament and Portfolio Committees	<ul style="list-style-type: none"> <li>• Oversee the implementation of the NCCR and Review legislation to support the NCCRP</li> <li>• BURs and National Communication reports are submitted to the committee for their approval.</li> </ul>
The Inter-Ministerial Committee on Climate Change (IMCCC)	<ul style="list-style-type: none"> <li>• Executive (Cabinet) level committee that coordinates and aligns climate change response actions with national policies and legislation</li> <li>• IMCCC oversees all aspects of the implementation of the NCCRP</li> <li>• The Minister of the Environment will chair the IMCCC.</li> </ul>
Forum of South African Directors- General clusters	<ul style="list-style-type: none"> <li>• South African Director-General clusters based on different mandates, will guide NCCRP actions.</li> </ul>
Intergovernmental Committee on Climate Change (IGCCC)	<ul style="list-style-type: none"> <li>• Operationalise cooperative governance</li> <li>• Consists of the relevant national and provincial departments and organised local government.</li> <li>• The Climate Change Flagship Programmes Steering Committee under the IGCCC was set up to address the planning and coordination deficit in implementation of the Flagship Programmes.</li> </ul>
National Disaster Management Council	<ul style="list-style-type: none"> <li>• Responsible for ensuring that the National Framework for Disaster Risk Management provides clear guidance across all spheres and sectors of government for managing climate change risk</li> <li>• Ensures effective communications strategy for early warnings to vulnerable communities.</li> </ul>
MINMEC and MINTECH	<ul style="list-style-type: none"> <li>• Facilitates high level of policy and strategy coherence among the three spheres of government ☑</li> <li>• Guide climate change work across the three spheres of government.</li> </ul>
National Committee on Climate Change (NCCC)	<ul style="list-style-type: none"> <li>• Consult with stakeholders from key sectors that impact on or are impacted by climate change</li> <li>• Advises on matters relating to national responsibilities</li> <li>• Advises on the implementation of climate change- related activities.</li> </ul>
National Economic Development and Labour Council (NEDLAC)	<ul style="list-style-type: none"> <li>• Forum where government comes together with organised business, labour and community groupings on a national level</li> <li>• Ensure that climate change policy implementation is balanced and meets the needs of all sectors of the economy.</li> </ul>
City Resilience Committees	<ul style="list-style-type: none"> <li>• Forums where city government come together to discuss climate change issues and how cities need to take lead in climate action.</li> </ul>

<sup>24</sup> DEA, 3<sup>rd</sup> BUR, July 2018, draft

*The role of the Department of Environmental Affairs*

As the designated authority for environmental conservation and protection in South Africa, DEA plays a central coordinating and policy making role. The department is responsible for providing guidance and ensuring that there is a clear alignment of policies and international obligations with respect to climate change. The DEA also leads the work on Climate Change Monitoring and Evaluation, and has overall responsibility for various climate change-related international reporting obligations, such as National Communications, Biennial Update Reports and National Inventory Reports. DEA chairs the Project Steering Committee (PSC) that is responsible for providing technical inputs and oversight on the preparation of these reports.

## Near Term Climate Change Priority Flagship programmes

The NCCRP envisages the Climate Change Flagship Programmes as “the crucial mechanism to direct and anchor immediate ambitious and practical action at an economy-wide scale and, to stimulate the investment required to firmly entrench the transition to low emissions and resilient development.”<sup>25</sup>

The Near-term Priority Flagship Programmes, cover both adaptation and mitigation measures. There are currently ten Climate Change Flagship Programmes, building on the initial set of 8 programmes, described in the NCCRP.

DEA is currently working on the scaled-up implementation of seven Climate Change Response Flagship Programmes by 2020, in collaboration with lead national departments and other spheres of government, government institutions, the private sector and civil society.

The evolution of the Climate Change Flagship Programmes is discussed in more detail in the next sub-section.

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<sup>25</sup> Annexure I, South Africa’s Third Climate Change Annual Report, Draft

Near -term Climate Change Priority Flagship Programmes

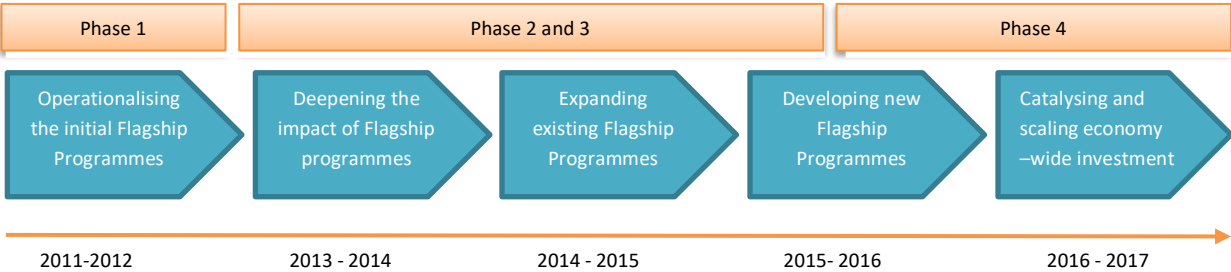
The Climate Change Flagship Programmes are government-led programmes intended to signal the climate change priorities and investment areas required for transitioning to a low-carbon and climate resilient society.

**Flagship Programmes:**

**Vision:** Accelerated implementation of high impact, large-scale catalytic climate action  
**Mission:** To champion implementation of climate action beyond pilot initiatives (DEA, undated)

The mitigation components of the Flagship Programmes are focused on the key emitting sectors, such as Energy, Transport, Agriculture and Waste, while the initial and current Adaptation Research Flagship Programme is underpinned by the need for robust data and scenario analysis to inform the scope of sector-based adaptation requirements, strategies and costs. These studies are considered prerequisites for designing appropriate adaptation strategies and response measures in the short, medium and long-term.

The evolution of the Flagship Programme since 2011 (Annexure I, 3<sup>rd</sup> CCAR, 2017, draft, adapted):



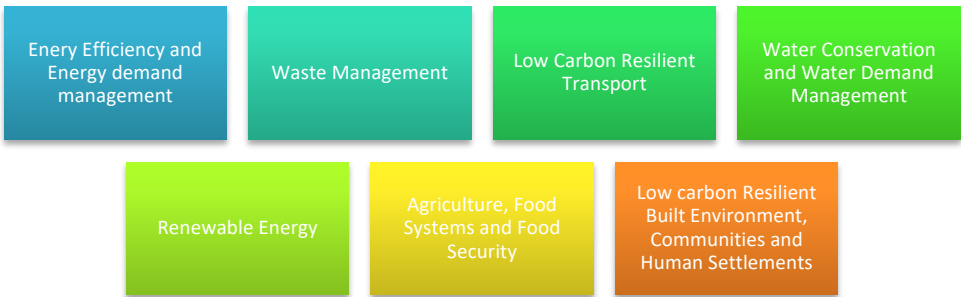
Refer to Annexure H for details related to the initial 8 near-term Priority Flagship Programmes (2011) and related sub-programmes or projects.

The expansion of the existing 8 Flagship Programmes, led to the inclusion of 2 additional flagship programmes around 2016, namely:

- The Agriculture, Food Systems and Food Security Flagship Programme; and
- The Low-Carbon Climate Resilient Built Environment, Communities and Human Settlements.

Following the Paris Agreement in 2015 (COP 21), there has been an acceleration and scale-up of the Near-Term Flagship Programmes, albeit that the extent of this acceleration or expansion differs depending on maturity and complexity of the respective interventions.

DEA invited national implementing departments and other key partners to formerly collaborate on scaling up new and existing Climate Change Flagship Programmes. As a consequence, the following seven (7) Priority Flagship Programmes are prioritized for further development and scaling from 2018 to 2030.



Source: Annexure I, Draft 3<sup>rd</sup> CCAR, 2017



The thematic investment areas (i.e. sectors and/subsectors) were prioritised, based on the following:

- key social and economic infrastructure fundamental to economic growth and social development;
- vulnerability to climate change or potential to mitigate climate change;
- pervasiveness of climate change impacts/benefits and impact on other sectors; and
- institutional readiness of the key implementation partners.

Even though the Government has identified i) Disaster Risk Reduction and Management, ii) Health and iii) Low Carbon Climate Resilient Spatial Development, as priority investment areas, there is currently no recognised Priority Flagship Programme covering these areas.

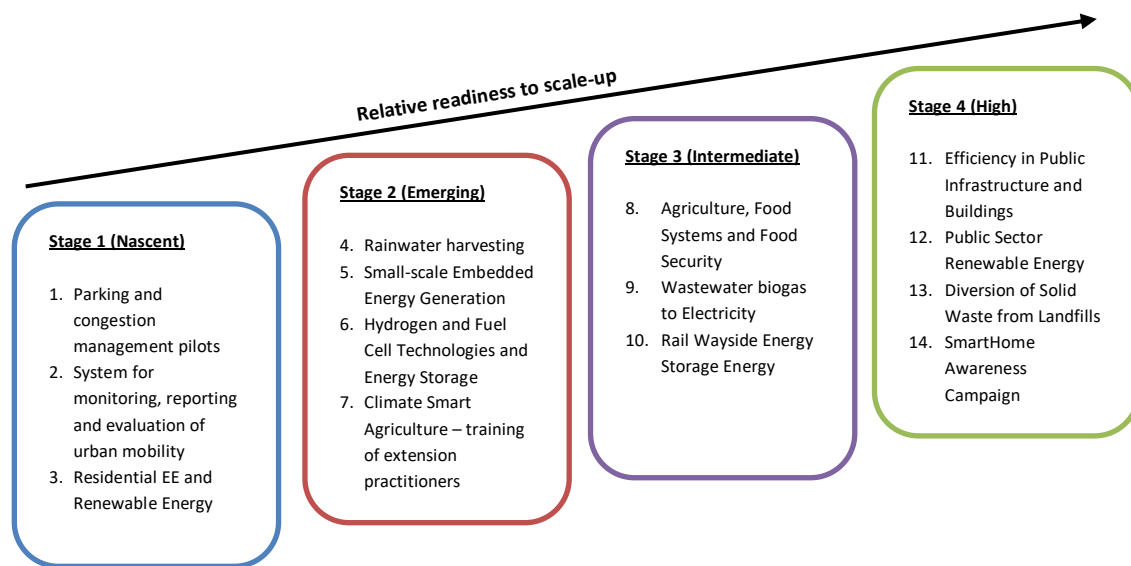
The below table is a summary of the 7 Priority Flagship Programmes and the 14 updated “priority work packages” under development since 2016 (i.e. existing and new mitigation and adaptation measures).

Climate Change Flagship Programmes and related work packages 2016 - 2017			
Flagship Programme	Priority work package	Core focus	Envisaged climate change outcome
Energy Efficiency and Energy Demand Management Flagship Programme (existing, deepened)	<b>Energy Efficiency (Mitigation):</b> <ul style="list-style-type: none"> <li>• Public Infrastructure and buildings</li> <li>• Residential Energy Efficiency and Renewable Energy</li> <li>• Smart Home Awareness Campaign</li> </ul>	<ul style="list-style-type: none"> <li>• Market development and expansion</li> <li>• Leveraging private sector investment</li> </ul>	Urgent, comprehensive and coordinated Large-scale implementation of energy efficiency measures and technologies, across all sectors of South Africa’s economy and society anchoring and stimulating the establishment of inclusive and localised energy services and technologies.
Waste Management Flagship Programme (existing, deepened and expanded)	<ul style="list-style-type: none"> <li>• <b>Diversion of solid waste from landfill</b></li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration scale implementation and development of implementation blueprints</li> <li>• Strengthening the regulatory framework</li> </ul>	Accelerated investment in, and implementation of large scale waste minimisation; recycling and composting of organic waste; using waste-to-energy opportunities available within the solid-, semi-solid- and liquid-waste management sectors; and establishing appropriate infrastructure and value chains to enable widespread uptake of low carbon waste management approaches.
	<ul style="list-style-type: none"> <li>• <b>Wastewater Biogas Generation for Electricity (Mitigation)</b></li> </ul>		
Transport Flagship Programme (existing, deepened)	<b>Tsamaya Sustainable Urban Transport NAMA (Mitigation):</b> <ul style="list-style-type: none"> <li>• Parking and congestion management pilots</li> <li>• System for monitoring, reporting and evaluation for urban mobility</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening the regulatory framework</li> <li>• Dedicated implementation support</li> </ul>	Accessible and integrated transport systems that prioritise the use of more efficient spatial design, transport networks and operations; low emissions transport modes, vehicles, fuels, technology; non-motorised transport; and climate-resilient infrastructure to enhance social mobility; access to economic opportunities and levels of rural access and connectedness.
Water Conservation and Demand Management Flagship Programme (existing, deepened)	<b>Water Conservation and Demand Management (Adaptation):</b> <ul style="list-style-type: none"> <li>• Rainwater Harvesting</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening of the regulatory framework</li> <li>• Development and piloting of implementation blueprints</li> </ul>	Urgent and large-scale implementation of efficient water systems, water storage and infrastructure coupled with prudent resource and demand management, and informed behavioural change
Renewable Energy Flagship Programme (existing, expanded)	<b>Renewable Energy (Mitigation):</b> <ul style="list-style-type: none"> <li>• Small-scale Embedded Energy Generation (Mitigation)</li> <li>• Public sector renewable Energy</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening the regulatory framework</li> <li>• Supporting systematic implementation</li> </ul>	Widespread development, integration and use of, and affordable access to, South Africa’s abundant renewable energy (RE) resources through the large-scale deployment of appropriate technologies at all scales driving innovation; localisation of RE goods, services and technologies; energy security and economic growth
	<ul style="list-style-type: none"> <li>• Hydrogen and Fuel Cell Technologies (Mitigation)</li> </ul>	<ul style="list-style-type: none"> <li>• Market development</li> <li>• Demonstration scale implementation and development of implementation blueprints</li> </ul>	
	<ul style="list-style-type: none"> <li>• Wayside Energy Storage (Transnet/PRASA)</li> </ul>		
Agriculture, Food Systems and Food Security Flagship Programme (New)	<b>Agriculture, Food Systems and Food Security (Cross-Cutting):</b> <ul style="list-style-type: none"> <li>• Training of extension practitioners on climate-smart agricultural practices</li> <li>• Agriculture, Food Systems and Food Security</li> </ul>	<ul style="list-style-type: none"> <li>• Strengthening the regulatory framework</li> <li>• Demonstration scale implementation of integrated approaches and new systems</li> </ul>	Widespread and urgent establishment of climate-smart agriculture, agroprocessing and food production systems to enhance productivity and climate resilience at all scales of production, and successfully integrating agroecological practices and resource efficient approaches to drive the growth and competitiveness of South Africa’s agricultural sector.
Low Carbon, Climate Resilient Built Environment, Communities and Human Settlements Flagship Programme (New)	<b>Low Carbon, Climate Resilient Built Environment, Communities and Human Settlements</b>	<ul style="list-style-type: none"> <li>• Strengthening the regulatory framework</li> <li>• Demonstration scale implementation of integrated approaches and new systems</li> </ul>	Resilient, low emissions and spatially efficient, rural, urban and coastal communities, settlements and infrastructure incorporating a highperformance green built environment, green building practices, green retrofits of existing buildings, protecting and enhancing natural ecosystems and extensive green infrastructure networks.

Source: 2<sup>nd</sup> CCAR, 2016 and Annexure I, 3<sup>rd</sup> CCAR, 2017, draft, adapted)

As can be seen from the above table, most of the Priority Flagship Programmes require “strengthening of the regulatory environment”, which impacts on their relative readiness to scale, as shown in the below graphic.

Stages of the Flagship Programmes' 14 priority work packages<sup>26</sup>



The diagram shows that the work packages are at different stages of implementation and therefore require actions and support in different areas. The level of readiness of the respective priority work packages was assessed based on the following implementation and success factors<sup>27</sup>:

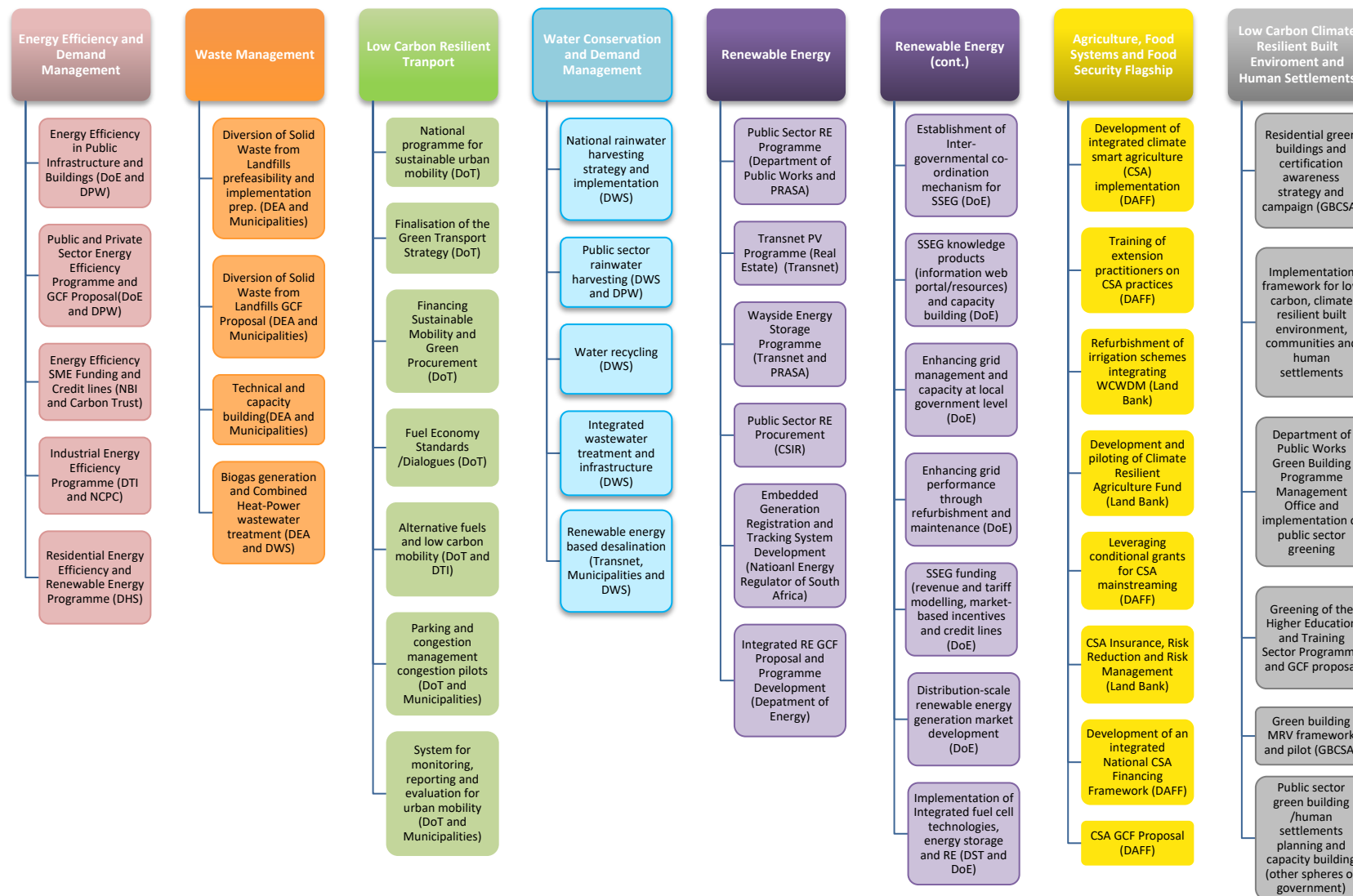
1. A well-defined and established regulatory framework.
2. The core activity(ies) and indicators in the regulatory framework readily translate into a quantifiable climate change impact.
3. An existing funding stream drawn from fiscal allocations is already in place.
4. Tested private sector investment models exist and are well understood.
5. Uses a range of finance instruments beyond grants.
6. Main technologies and/or practices are mature and well established.
7. An established implementation base is in place at demonstration scale.
8. A designated champion leading the work within the relevant national department

Below is a high-level breakdown of the components of the 7 prioritised Flagship Programmes.

<sup>26</sup> DEA, Annexure I, South Africa's 3<sup>rd</sup> CCAR, 2017, Draft

<sup>27</sup> DEA, Annexure I, South Africa's 3<sup>rd</sup> CCAR, 2017, Draft

Components of the 2016-2017 prioritised Flagship Programmes (Annexure I, 3<sup>rd</sup> CCAR, 2017, draft).



The Climate Change Flagship Programmes represent South Africa's key connection with the primary climate finance mechanism of the UNFCCC, the GCF and other funding opportunities. Below is a summary of how the Climate Change Flagship Programme is contributing to catalysing scaled-up investment for climate action:<sup>28</sup>

Funding Source	Role of Climate Change Flagship Programmes	Accredited Entity
<b>NAMA Facility Funding</b>	<ul style="list-style-type: none"> <li>DEA, in collaboration its partners, have successfully applied for funding from the NAMA Facility to implement an Energy Efficiency in Public Infrastructure and Buildings Programme as part of scaling up the Energy Efficiency and Energy Demand Management Flagship Programme.</li> <li>The programme is set to be implemented in 2018.</li> <li>Partners include, Department of Energy, Department of Public Works, the National Business Initiative, the Carbon Trust; Local Government; the IDC and GIZ.</li> </ul>	GIZ
<b>South Africa's Green Climate Fund Strategic Investment Framework</b>	<ul style="list-style-type: none"> <li>South Africa's Climate Change Flagship Programmes forms the foundation of South Africa's Green Climate Fund Strategic Investment Framework, which allow for a coherent engagement with the GCF in terms of South Africa's national climate change response priorities.</li> </ul>	Not Applicable
<b>South Africa's Green Climate Fund Country Programme</b>	<ul style="list-style-type: none"> <li>The Climate Change Flagship Programmes currently constitute the vast majority of South Africa's GCF country programme at of over 95% of South Africa's GCF proposal pipeline.</li> <li>The following funding proposals to the GCF are being developed as part of the Climate Change Flagship Programmes<sup>29</sup>:               <ol style="list-style-type: none"> <li>National Public and Private Sector Energy Efficiency Programme Proposal (project lead – Department of Energy)</li> <li>National Public Sector Renewable Energy Programme (project lead – Department of Public Works and PRASA)</li> <li>National Renewable Energy Programme (project lead – Department of Energy)</li> <li>Diversion of Solid Waste from Landfills – Alternative Waste Management Technologies (project lead – Department of Environmental Affairs)</li> <li>Climate Resilient Agriculture Programme (project lead – Department of Agriculture, Forestry and Fisheries)</li> <li>Credit Lines for Climate Resilient Agriculture (project lead – Land Bank)</li> <li>Greening Higher Education Residences Programme (project lead – Department of Higher Education and Training)</li> <li>Wayside Energy Storage (Transnet)</li> </ol> </li> </ul>	
<b>GEF</b>	<ul style="list-style-type: none"> <li>DEA has also received support through the Global Environmental Facility (GEF) to scale-up the Agriculture, Food Systems and Food Security Flagship Programme and the Water Conservation and Demand Management Flagship Programme</li> </ul>	UNDP
<b>GIZ Climate Support Programme</b>	<ul style="list-style-type: none"> <li>The majority of the DEA work on the Climate Change Flagship Programmes is supported through the Climate Support Programme (CSP) as part of the South African and the German bilateral collaboration via the International Climate Initiative (IKI).</li> <li>The CSP is now in its 3rd phase (2017 – 2019), and supports aspects of scaling-up all of the Climate Change Flagship Programmes, except Carbon Capture and Storage.</li> </ul>	GIZ

<sup>28</sup> DEA, Annexure I, Consolidated 3<sup>rd</sup> CCAR, 2017, draft [adapted]

<sup>29</sup> Other GCF funding proposals include SANBI's "Readiness and Preparatory Support" proposal to build capacity to develop GCF proposals and manage and monitor its GCF project portfolio in South Africa, as well as SANBI's "Adaptation -Enhanced Direct Access" proposal.

Funding Source	Role of Climate Change Flagship Programmes	Accredited Entity
<b>Submission of NAMAs to the UNFCCC NAMA Registry</b>	<ul style="list-style-type: none"> <li>• South Africa's Nationally Appropriate Mitigation Actions (NAMAs) are developed within the mitigation Climate Change Flagship Programmes.</li> <li>• The following NAMAs have been nominated for submission to the UNFCCC NAMA Registry               <ol style="list-style-type: none"> <li>1. Renewable Energy Independent Power Procurement Programme</li> <li>2. Integrated Demand Management</li> <li>3. Industrial Energy Efficiency Project (Phase 1)</li> <li>4. Gautrain (Phase 1)</li> <li>5. Transnet Freight Modal Shift</li> <li>6. Implementation of Carbon Capture and Storage roadmap for South Africa</li> </ol> </li> </ul>	Not Applicable

According to DEA, it has “established dedicated advisory, technical, climate finance, coordination and implementation capacity, within the Climate Change Response Near-term Flagship Programmes Directorate, to support the relevant lead national departments and other key implementation partners collaborating with DEA, to prepare and operationalise detailed business plans for financing and implementing South Africa’s NDC.”<sup>30</sup>

### Repositioning and refocusing of the Climate Change Flagship Programme Steering Committee

According to DEA, the NCCRP indicates that the appropriate line function Ministry should take the lead in the implementation of Climate Change Flagship Programmes as they have the relevant technical expertise to provide the service. It further claims that, “although the NCCRP provides guidance on the coordination and governance of the Climate Change Flagship Programmes; this guidance was not implemented to the extent required” [paraphrased], with the following consequences:

- a) All the Climate Change Flagship Programmes, with the exception the Carbon Capture and Storage Flagship Programme, lacked a clearly discernible coordination or governance structure and, any associated programme documentation or implementation framework, as had been directed by the NCCRP.
- b) In most cases, there had been no analysis or quantification of the mitigation or adaptation outcomes expected from the programme, nor was there a defined reporting format and climate change related indicators as directed by the NCCRP.

“The Department of Planning Monitoring & Evaluation (DPME) similarly, found major issues in the planning and coordination of implementation programmes across all spheres of government, caused by poor programme design, planning and coordination; resulting in ineffective and inefficient implementation of government policy (PME 2013).”<sup>31</sup>

The Climate Change Flagship Programmes Steering Committee (CCFPSC) became operational in 2015 and is located under the Intergovernmental Committee on Climate Change (IGCCC). The CCFPSC includes representation from all relevant national line departments, including Department of Cooperative Governance; all nine provinces and the South African Local Government Association. The CCFPSC represents a first step measure in addressing the planning and coordination deficit in the implementation of the Climate Change Flagship Programmes.

<sup>30</sup> DEA, South Africa’s 3<sup>rd</sup> CCAR, 2017, draft

<sup>31</sup> DEA, South Africa’s 3<sup>rd</sup> CCAR, 2017, draft

According to South Africa's draft 3<sup>rd</sup> CCAR, 2017, DEA has worked hard to improve the cohesion and coordination of Climate Change Flagship Programmes in partnership with lead departments and other partners in the implementation of these programmes. The result is a repositioning and refocusing of the CCFPSC as the crucial next step in enabling rigorous coordination and planning of large-scale climate action, the development of the associated business plans required to attract investment and finance and; ultimately, operationalising the Climate Change Flagship Programmes by 2020. No details have been found in the draft 3<sup>rd</sup> CCAR, 2017 on the specific measures taken by DEA, to strengthen the function of the CCFPSC.

Analysis of South Africa’s Public Environmental Expenditure

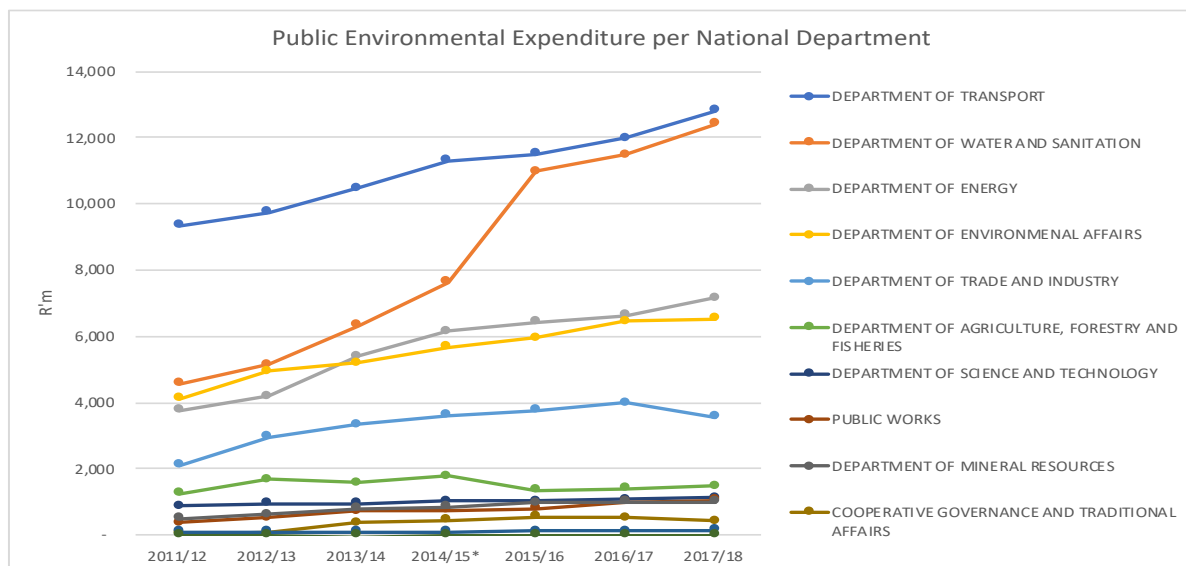
Public Environmental Expenditure Reviews (PEERs) have been used as a medium to evaluate the fiscal environmental management practices of countries. PEERs are therefore intended to go beyond simply identifying environmental expenditures, but also to consider whether:

- i. environmental expenditures are targeted at current policy priorities,
- ii. they are addressing environmental issues in the most appropriate manner, and
- iii. individual environmental expenditure programmes are efficient.

According to South Africa’s first PEER Discussion Paper (2016)<sup>32</sup>, South Africa’s environmental expenditure landscape is considered to be very complex. This is due to (amongst others) public sector responsibilities for environmental issues being spread across all spheres of government, with a number of concurrent competencies where different spheres of government are responsible for environmental issues that fall within the same environmental theme. The analyses of public environmental expenditures across national and provincial spheres of government is further complicated by the lack of consistency in the allocation of functions and the use of naming conventions between national departments, provincial departments, and local government, making comparison difficult.

Given these complexities, the discussion paper provides “a description of the quantitative status quo of current public environmental expenditure within the limits of the available data, rather than a full public environmental expenditure review”.

The Discussion Paper estimates that the South African Government spent a total of R270bn on Public Environmental Expenditure<sup>33</sup> (PEE) over the period 2011/12 to 2017/18. Below is a breakdown of and trend in the environmental spend (in Rm) per national department over the same period:

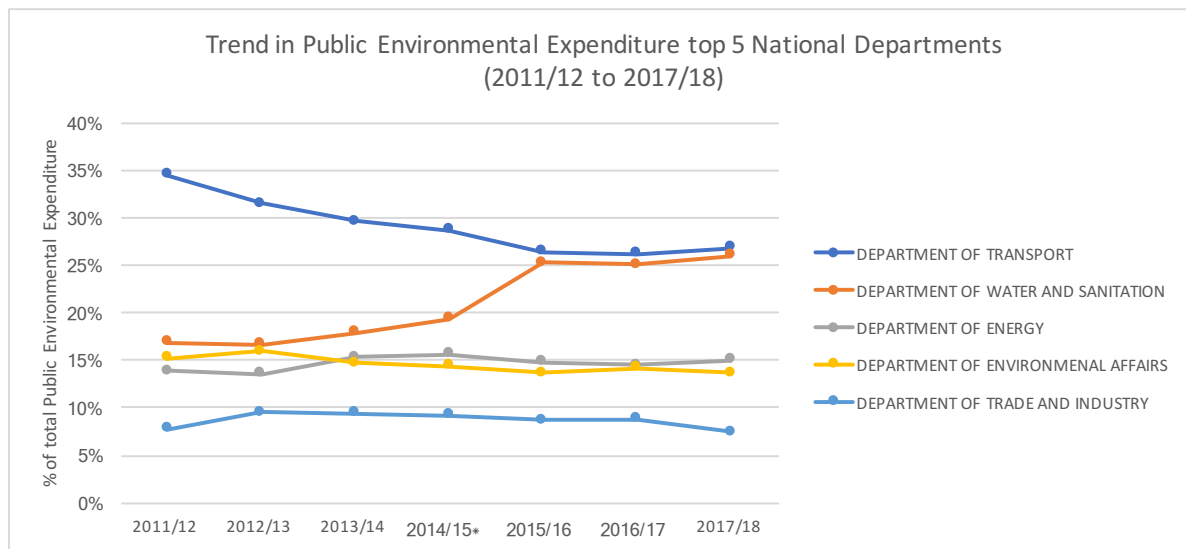


<sup>32</sup> High-level Public Environmental Expenditure Review: A Discussion Paper, National Treasury, April 2016

<sup>33</sup> Public environmental expenditure is defined as expenditures by public institutions on activities which lead to the prevention, reduction and elimination of pollution or any other degradation of the environment resulting from human activity, as well as natural resource management activities not aimed at resource exploitation or production (Swanson & Lundethors, 2003). In addition, spending on programmes that directly address and impact upon environment and climate change concerns, but introduced to achieve other, non-environmental objectives, is included in the definition of public environmental expenditure and used as the basis for the high-level PEER for South Africa. (The aforementioned is the definition used by the World Bank). The definition is further expanded to include environmentally beneficial expenditure by programmes that did not have environmental outcomes as their primary objectives.

Total annual PEE increased by a compound annual growth rate (CAGR) of 10% from R27bn in 2011/12 to R48bn in 2017/18. The top five National Departments (by Rands spent) account for 88% (R237bn) of total PEE over the period 2011/12 to 2017/18, as shown in the table below.

The relative contribution and trend of the top 5 National Departments are shown below.



Source: Adapted from PEER

Due to its relatively large budget size, the Department of Transport (DoT) remains the largest contributor to PEE, although its relative annual contribution as a percentage of total annual PEE have declined over the period. On the other hand, DWS has significantly increased PEE over the review period, with contributions being in line with that of the DoT for the past three years. The Department of Environmental Affairs’ (DEA) expenditure has declined marginally as a percentage of the total and is attributable to its relatively small budget in relation to other National Departments.

Top 15 Sub-programmes by value of PEE (2011/12 to 2017/18)

Sub-Programme	ZARbn
Public Transport Oversight	75.8
Water Services Infrastructure	48.7
Integrated National Electrification	32.5
Manufacturing Incentives	23.4
Working for Water and Working on Fire	12.5
Environmental Protection and Infrastructure	9.3
Energy Efficiency	6.5
Sector Innovation and Green Economy	6.0
Expanded Public Works	5.2
Natural Resources Management	3.8
Water Information Management	3.6
Forestry Operations	3.2
Water Sector Support	2.3
Council for Mineral Technology	2.2
Oceans Conservation	2.2
	<b>237.3</b>

Refer to Annexure E for details of PEE per department, programme and sub-programme.



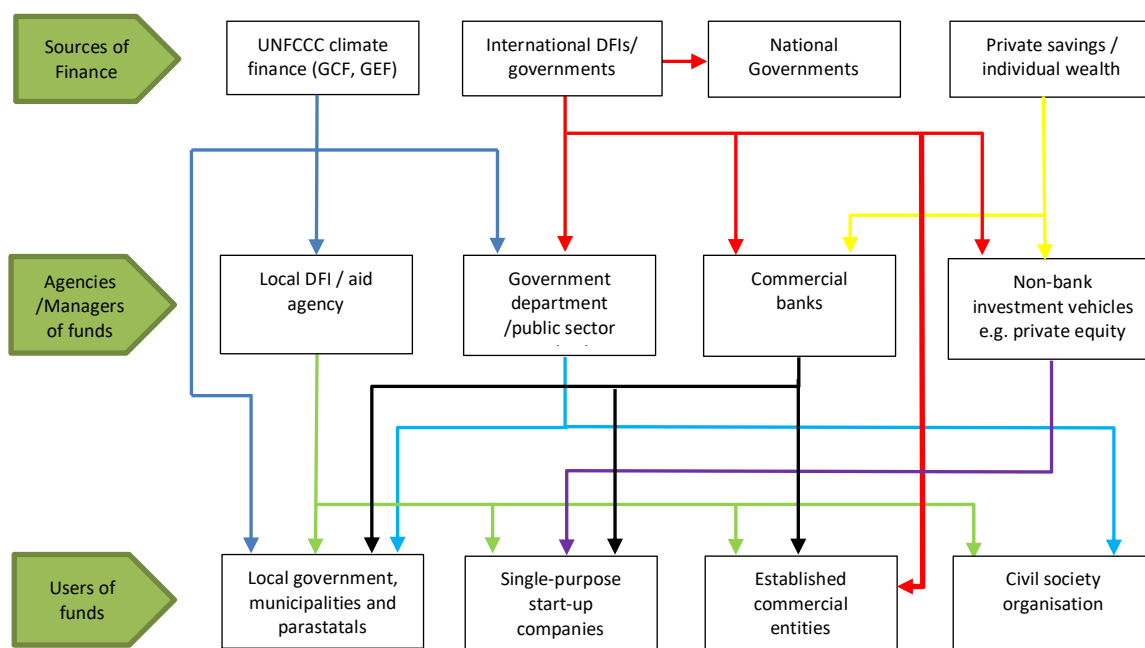
### Climate finance in South Africa

#### Climate finance<sup>34</sup> - definition

Given the rapidly evolving field of climate finance, there is no real consensus around the exact definition of climate finance. However, South Africa’s NCCRP makes a useful attempt, “climate finance is defined as all resources that finance the cost of South Africa’s transition to a lower-carbon and climate resilient economy and society. This covers both climate-specific and climate-relevant financial resources, public and private, domestic and international. This includes: financial resources that go towards reducing emissions and enhancing sinks of greenhouse gases; reducing vulnerability, maintaining and increasing the resilience of human and ecological systems to negative climate change impacts; climate-resilient and low-emission strategies, plans and policies; climate research and climate monitoring systems; as well as climate change capacity-building and technology”.

#### Climate finance landscape and challenges

The climate finance landscape in South Africa (and in many developing countries) is complex and tracking climate finance flows and uses is a challenge. The below infographic<sup>35</sup> provides a useful high-level framework for understanding the actors and financial flows in terms of the sources, intermediaries and users of climate finance.



A number of challenges have been noted in the literature<sup>36</sup> that affect climate finance mobilisation in South Africa, including:

- Inadequate alignment of development priorities and policies between the different spheres of government (national, provincial and local);
- Fragmented approach and lack of coordination and/or communication;

<sup>34</sup> It is worth noting that “climate finance” is a relatively new and rapidly evolving field and thus there is no single accepted definition.

<sup>35</sup> NBI and KPMG, 2012

<sup>36</sup> BUR 2, 2016; Reflections on climate finance in South Africa, DBSA; OECD 2017, Estimating Publicly-Mobilised Private Finance for Climate Action

- High transaction costs and limited track record;
- Capacity constraints that inhibit the preparation of bankable projects that fail financial close; and
- Lack of awareness of available resources, including tracking and reporting of climate flows.

#### South Africa's proposed funding framework for climate change

South Africa's resource mobilisation strategy is informed by the mainstreaming of climate change into the planning and decision-making of government, private sector and civil society. In terms of the NCCRP, Government aims to:

- Create an enabling environment whereby government, private sector and civil society collectively respond to socio-economic changes necessary for climate-resilient development and job creation;
- Promote, support and secure resources for climate change and green economy interventions; and
- Consolidate and extend existing initiatives towards a climate-resilient economy, particularly the Near-term Priority Flagship Programmes.

The NCCRP states that in terms of the long-term funding framework for climate finance, "Government will:

- Promote fair, transparent and timely access to international and domestic resources for both mitigation and adaptation actions by the public and private sectors as well as civil society.
- Mainstream climate change response into the fiscal budgetary process and so integrate the climate change response programmes at national, provincial and local government and at development finance institutions and state-owned entities.
- Enable the local development finance institutions to create and implement long-term climate-resilient investment programmes. This includes project development, financial and risk insurance products, technical assistance and capacity-building within their mandates.
- Identify opportunities in the existing financial regulations governing the domestic finance sector to enhance the financial sector's capacity to mainstream climate change in risk and investment decisions.
- Establish and/or support public platforms to assimilate and disseminate climate science, finance, technology and other related research and information to enable effective decisions about risk and investment.
- Develop a climate finance strategy that contextualises and integrates existing and emerging policy and financing instruments, including addressing the role of market-based measures to achieve the desired economic and social changes."

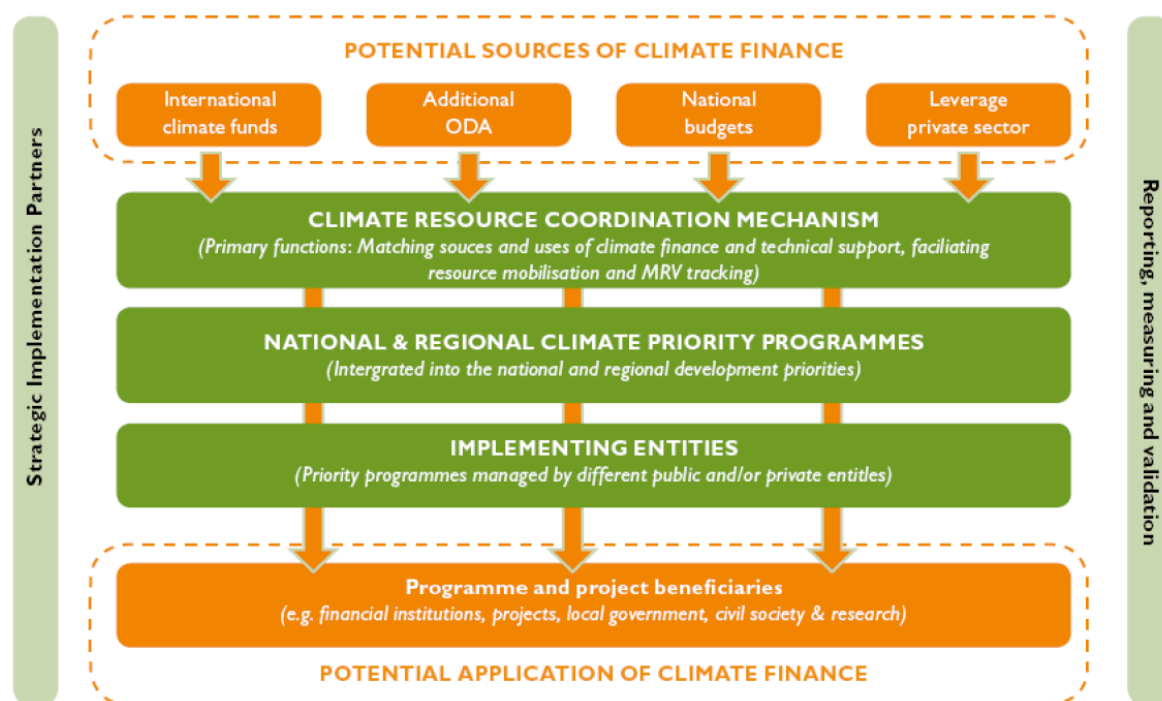
The importance of the following financial institutions, in allocating and transferring capital flows between different economic activities, are also noted in the NCCRP:

- **Public finance** can support climate change through the procurement of sustainable technologies by Government as well as developing catalytic projects and programmes.
- **Development finance institutions**, such as the Development Bank of Southern Africa (DBSA), Industrial Development Corporation, Land Bank and Khula Enterprises can incubate climate-resilient development. This is particularly true for climate-proofing of infrastructure and industrial processes; designing and testing new financing instruments; localising and rolling out of sustainable technologies; and unlocking new economic opportunities through enterprise development and job creation. Further, these institutions serve an important role in building technical capacity and knowledge platforms to mobilise action at regional, provincial and local level.
- **Private banks and microfinance institutions** support a range of corporate and entrepreneurial ventures that could contribute to climate change resilience.
- **Investors such as asset managers, venture capital and private equity firms** are essential for both long-term and early-stage investments.

- **Insurers** are essential for risk mitigation and innovative climate change-related products.
- **International and corporate grant-providers** are necessary to support the comprehensive financing package necessary for the scale of mitigation and adaptation interventions that South Africa needs.

The National Treasury (NT), the Economic Development Department (EDD) and the Department of Environmental Affairs (DEA) are tasked with developing a climate finance strategy and finance mechanism to achieve South Africa’s sustainable development and climate change goals.<sup>37</sup> Work on the design and implementation of a Climate Finance Co-ordination Mechanism (CFCM) is underway.

The DBSA (appointed by the DEA to investigate the finance mechanism) has proposed the following framework prototype for coordinating and tracking climate finance in South Africa (Chantal Naidoo, DBSA, 2011).



The proposed coordination mechanism seeks to:

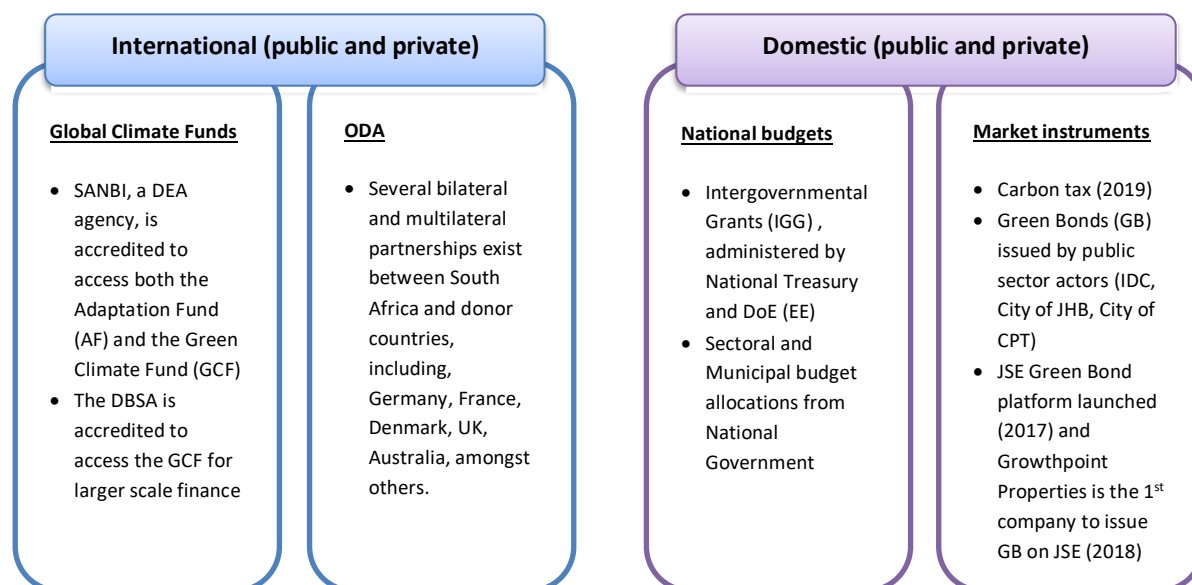
- Track the sources of climate funds and provide transparency and access to information;
- Direct funding to support a balanced programme linked to national, provincial and local priorities;
- Match resources and financial instruments (grants, concessionary debt and guarantees and/or risk insurance) to the identified priority programmes.
- Support implementing entities with capacity to access funding; and monitor the impact on project beneficiaries.

The proposed structure is expected to increase the integration between sources of climate finance and technical support. Further analysis is required to determine the (i) status of implementation and operationalisation of the Coordination Mechanism, (ii) the extent of any refinements to the structure and (iii) effectiveness of the mechanism in terms of the stated aims.

<sup>37</sup> DEA, BUR 2, 2016

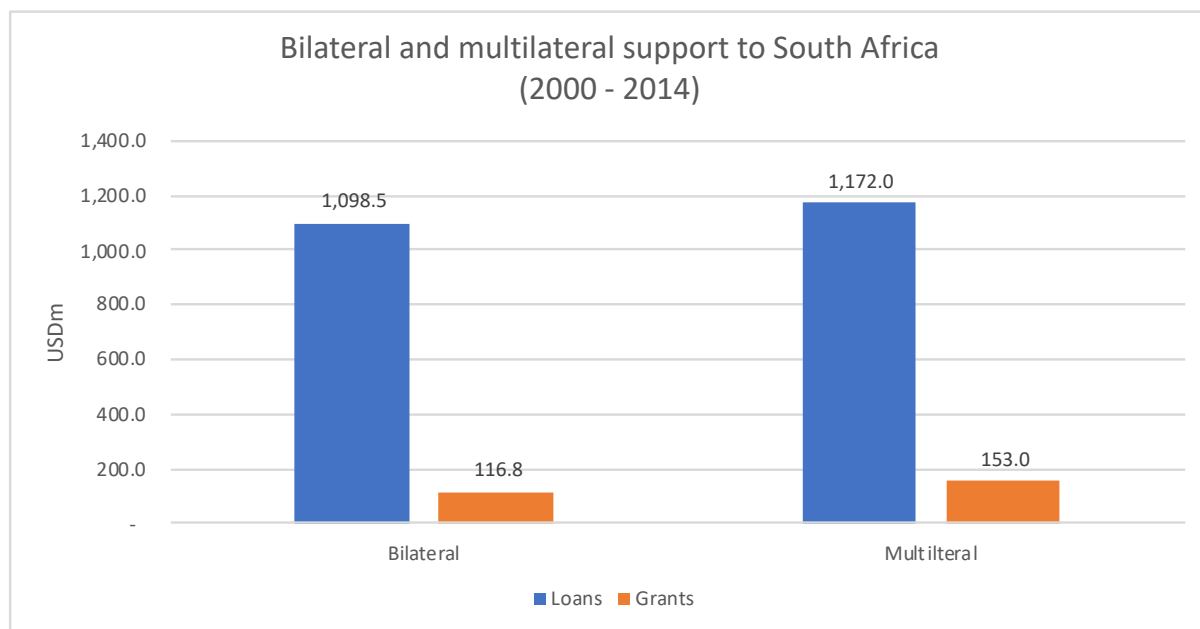
Mechanism to access climate finance in South Africa

The below graphic provides a high-level overview of existing mechanisms used to access climate finance in South Africa.



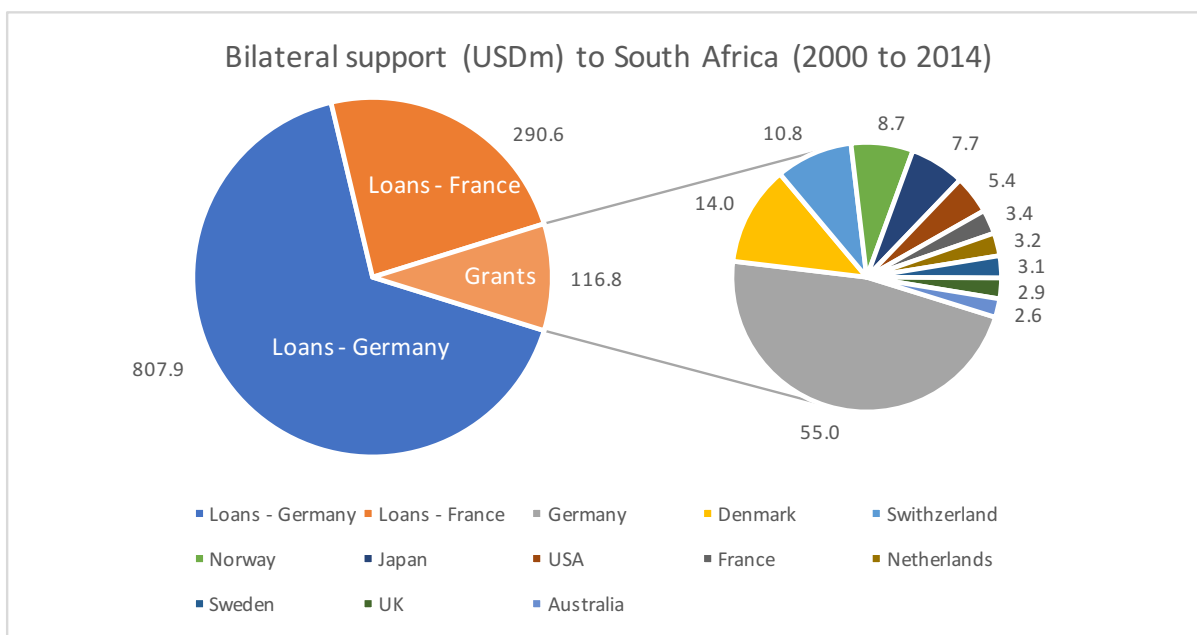
International funding support received by South Africa (2000 to 2014)

South Africa received in excess of USD2.5bn in financial support from bilateral and multilateral sources in order to develop its climate change responses during the period of 2000-2014, as shown in the graph below.



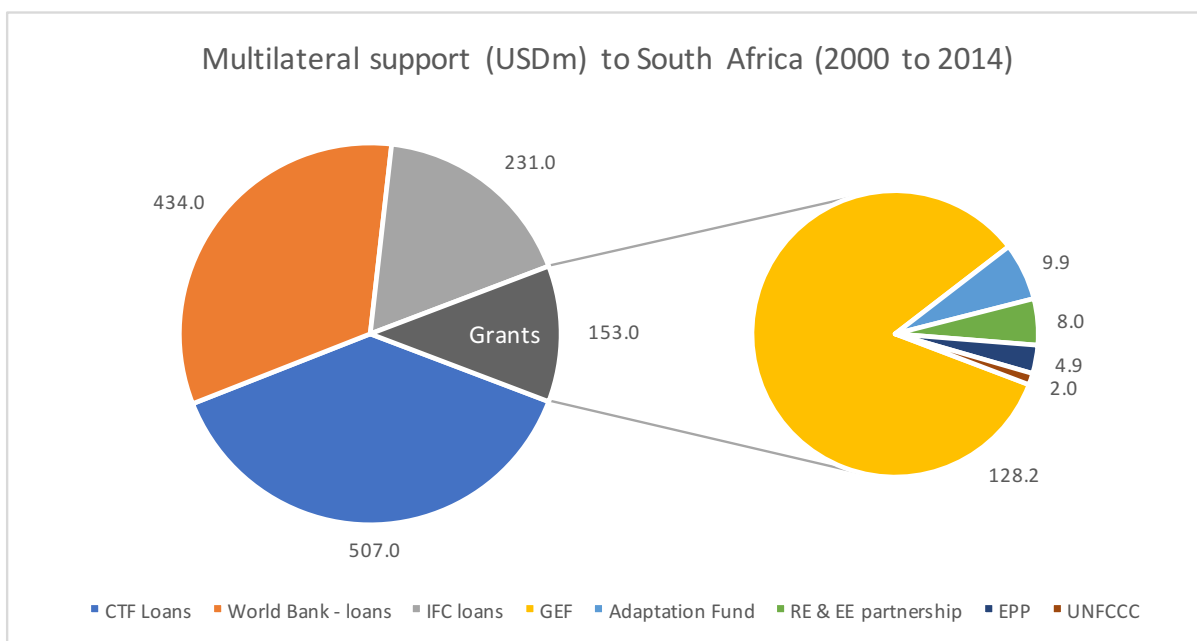
Source: Adapted from BUR 2, 2016

A breakdown of the bilateral funding (loans and grants) to South Africa is shown below (BUR 2, 2016).



According to South Africa’s 2<sup>nd</sup> Biennial Update Report (BUR 2,2016), Germany contributed 74% of the loan funding, with the balance of 26% provided by France. Germany was also the largest contributor (47%) of bilateral grant funding over the period. Through the Climate Support Programme (CSP, 2009) Germany has been actively involved in supporting South Africa with the development of the NCCRP, LTAS, sectoral mitigation potential studies, and the monitoring and evaluation framework, amongst other climate change interventions.

A breakdown of the multilateral funding (loans and grants) to South Africa is shown below (BUR 2, 2016).



South Africa received a total of USD1 325m (Loans: [88%], Grants: [22]%) in multilateral support over the period 2000 to 2014. The Clean Technology Fund was the single largest lender (43% of total multilateral loans), with the IFC and other World Bank entities contributing the balance of the loans. The GEF was the single largest multilateral grant funder to South Africa (84% of total multilateral grant funding).

According to Climate Funds Update, multilateral support for South Africa reached USD590m between 2007 and 2017, with only USD183m (31%) being disbursed. This is to an extent indicative of the persistent challenges related to project implementation, which hampers the speedy disbursement of funds.

<b>Fund</b>	<b>Funding Approved (USDm)</b>	<b>Funding disbursed (USDm)</b>
Clean Technology Fund (CTF)	495.2	132.5
Global Environment Facility (GEF6)	24.2	15.0
Global Environment Facility (GEF5)	21.8	9.6
Global Environment Facility (GEF4)	18.0	18.0
Green Climate Fund (GCF)	12.2	-
Adaptation Fund (AF)	10.0	4.5
Partnership for Market Readiness	5.4	-
Special Climate Change Fund (SCCF)	3.5	3.5
<b>Grand Total</b>	<b>590.3</b>	<b>183.0</b>

Source: [www.climatefundsupdate.org](http://www.climatefundsupdate.org)

#### *The Clean Technology Fund*

The Clean Technology Fund (CTF) is the largest of the four multilateral Climate Investment Funds (CIF) administered by the World Bank Group. The CTF provides concessional finance at significant scale for long-term carbon emissions reductions within 15 middle income developing countries that have high greenhouse gas abatement potential.

Key programmes funded or approved for funding include:

- Eskom Renewable Energy Support Program – Concentrated Solar Power (accounts for approximately 53% of the total approved funding from the CTF) reflected in the table above)
- Eskom Renewable Energy Support Program – Wind
- South Africa Sustainable Energy Acceleration Program
- Expansion of the South Africa Sustainable Energy Acceleration Programme
- South Africa Energy Efficiency Program

#### *The Global Environmental Facility*

The Global Environment Facility was established in 1992 to tackle global environmental problems, with a focus on biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. Today, the GEF is an international partnership of 183 countries, international institutions, civil society organizations and the private sector. As of June 2018, the GEF has provided over USD17.9 billion in grants and mobilized an additional USD93.2 billion in co-financing for more than 4500 projects in 170 countries.

Over the last 27 years, the GEF has been involved and contributed in the following areas:<sup>38</sup>

- Protected Areas;
- Sustainable landscape and seascape;
- Sustainable forest management;
- Sustainable land management;

<sup>38</sup> <https://www.thegef.org/about-us>

- GHG emission reduction;
- Integrated water resources management;
- Safe disposal of hazardous chemicals; and
- Adaptation to climate change.

Specific GEF 4 to GEF6 projects or programmes funded or approved for funding in South Africa, include:

- Market transformation through Energy Efficiency Standards
- Reducing the Carbon Footprint of Major Sporting Events, FIFA 2010
- Sustainable Public Transport and Sport: A 2010 Opportunity
- Enabling South Africa to Prepare Its Third National Communication
- Energy Efficient Low-carbon Transport
- GEF UNIDO Cleantech Programme for SMEs in South Africa
- Greening the COP17 in Durban
- Industrial Energy Efficiency Improvement in South Africa
- Promoting Organic Waste-to-Energy and other Low-carbon
- South Africa Wind Energy Project (SAWEP) Phase II
- Cities Integrated Approach Pilot (IAP): Building a Resilient and Resource Efficient Johannesburg
- Equity Fund for the Small Projects Independent Power Producers Programme

#### *The Special Climate Change Fund*

The Special Climate Change Fund (SCCF) was established under the UNFCCC in 2001 to complement other funding mechanisms. It seeks to finance climate change activities, particularly adaptation, technology transfer and capacity building; energy, transport, industry, agriculture, forestry and waste management; and economic diversification. The GEF operates as the secretariat for the SCCF and it is based on voluntary donor contributions.

#### Adaptation Fund

The Adaptation Fund was established under the Kyoto Protocol of the UN Framework Convention on Climate Change, and since 2010 has committed US\$ 512 million to climate adaptation and resilience activities, including supporting 77 concrete adaptation projects. The Fund is financed in part by government and private donors, and also from a two percent share of proceeds of Certified Emission Reductions (CERs) issued under the Protocol's Clean Development Mechanism projects.<sup>39</sup>

Projects or programmes funded or approved for funding in South Africa, include

- Building resilience in the Greater uMngeni Catchment.
- Taking adaptation to the ground: A Small Grants Facility for enabling local level responses to climate change.
- Technical Assistance Grant for Environmental and Social Policy.

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<sup>39</sup> <https://www.adaptation-fund.org/about/>

The Green Climate Fund

The Green Climate Fund<sup>40</sup> is a new global fund established to support the efforts of developing countries to respond to the challenge of climate change. The GCF launched its initial resource mobilization in 2014, and achieved funding pledges worth USD 10.3 billion, with some USD 3.5 billion committed and USD 1.4 billion being implemented. As the largest international fund dedicated exclusively to help developing countries address the challenges of climate change, the GCF aims to support developing countries to limit or reduce their GHG emissions, and adapt to climate change impacts.

“GCF’s activities are aligned with the priorities of developing countries through the principle of country ownership, and the Fund has established a direct access modality so that national and sub-national organisations can receive funding directly, rather than only via international intermediaries.” (GCF, undated)

The GCF works directly with the public and private sectors to mobilise climate finance. National Designated Authorities (NDAs) for each developing country act as the country’s interface with the Fund, and are involved closely in all of GCF’s funding processes.

*GCF Private Sector Facility*

GCF has set up the Private Sector Facility (PSF) to fund and mobilize institutional investors and leverage GCF’s funds to encourage co-investment by private sector corporations. The GCF’s PSF is actively engaging with pension funds, insurance companies, corporations, local and regional financial intermediaries, and the capital markets.

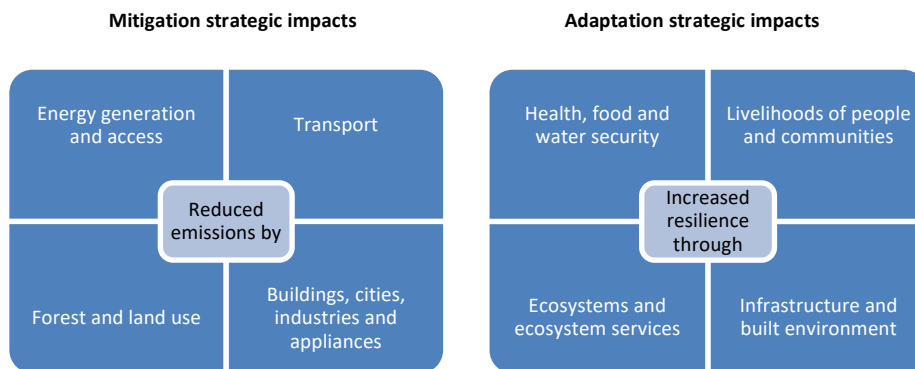
The GCF Investment Criteria are used to assess project or programme proposals submitted to the GCF by Accredited Entities. The six investment criteria that guide its decisions are as follows:

Criteria	Description
1. Impact potential	Potential of the programme/project to contribute to the achievement of the Fund’s objectives and results areas.
2. Paradigm shift potential	Degree to which the proposed activity can catalyse impact beyond a one-off project or programme investment (scalability and replicability). Overall contribution to global low-carbon development pathways
3. Sustainable development potential	Wider priorities and co-benefits (environmental, social, economic and gender)
4. Needs of the recipient	Vulnerability and Financing needs of the beneficiary country and population and lac of alternative sources of finance
5. Country ownership	Beneficiary country ownership of and capacity to implement a funded project or programme (including policies, climate strategies and institutional capacity).
6. Efficiency and effectiveness	Economic and (if appropriate) financial soundness of the programme or project. Is it Cost effectiveness and efficient and (expected economic and financial IRR). Amount of co-financing (leverage potential - mitigation) Industry best practice and degree of innovation

<sup>40</sup> <https://www.greenclimate.fund/who-we-are/about-the-fund>



The eight strategic impact areas targeted by the GCF, are:



Source: GCF

Since its launch, the focus of funding globally has been on energy generation and access and is possibly due to the relatively large size of these projects and geographic spread. According to the GCF, funding requests for mitigation in the transport sector has been low, while the pipeline of funding proposals targeting the Forest and Land Use segment have increased significantly, largely driven by Latin America, Caribbean and Africa.

In terms of the adaptation results areas, the *Livelihood of people and communities* represents the largest focus in terms of submitted and /or approved projects as well as the current project pipeline. It is suggested that this may be due to cross-cutting projects that tend to cover several results areas, including Livelihoods of people and communities.

As of September 2018, in terms of funding, the GCF has disbursed USD1.4bn of funding in respect of 74 projects that are being implemented. Of this funding, 40% relates to mitigation, 30% to adaptation and 30% are cross cutting. Other relevant information related to GCF funding are provided below.



Source: <https://www.greenclimate.fund/what-we-do/portfolio-dashboard>

*South Africa’s Direct Access Entities for selected climate funds*

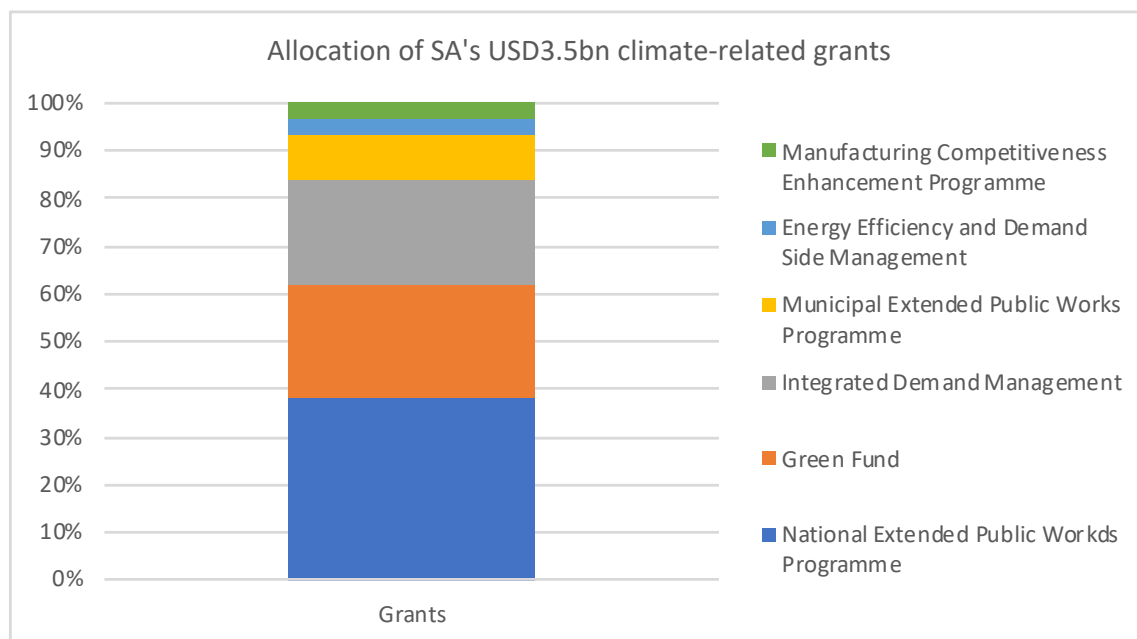
<b>Fund</b>	<b>Entity</b>	<b>Status</b>
GCF	South African National Biodiversity Institute (SANBI) is the National Implementing Entity for projects no greater than USD 50 million (Grants only)	Accredited
	Development Bank of Southern Africa for projects greater than USD 250 million	Accredited
	Land Bank of South Africa	Undergoing Accreditation
Global Environmental Facility	Development Bank of Southern Africa	Accredited
Adaptation Fund	SANBI National Implementing Entity for projects no greater than USD 50 million	Accredited

*Source: Annexure I, Draft 3<sup>rd</sup> CCAR, 2018)*

Domestic public climate finance

The South African Government invested approximately USD 3.5bn in the form of grants and USD 139m in the form of loans in climate-related programmes over the period 2000 to 2014. (BUR 2, 2016). The loan investments of USD 139m were split between the Green Fund Investment Projects (47%) and the Green Energy Efficiency Fund (53%).

The allocation of the USD3.5bn domestic grants is shown in the below graph:



Source: (BUR 2, 2016)

It is noted that the above domestic climate funds of USD3.5bn is but a subset of the PEE presented earlier.

Selected local climate funds

Green Fund

The Green Fund is a national environmental programme managed and implemented by the Development Bank of Southern Africa (DBSA) on behalf of the Department of Environmental Affairs (DEA). The Green Fund was established in 2012 (with an initial allocation of R800m) and was mandates to leverage and attract additional resources to support South Africa’s transition to a green economy by using public finance as a stimulus for green investments (Green Fund, 2014).

The funding windows and focus areas are presented below:

Funding window	Focus area
<p><b>Green Cities and towns –</b>  <i>strives for well run, compact and efficient cities and towns that deliver essential services to their residents, utilising available natural resources efficiently and sustainably.</i></p>	<ul style="list-style-type: none"> <li>• Sustainable transport</li> <li>• Sustainable waste management and recycling</li> <li>• Renewable energy, including off grid and mini grid</li> <li>• Sustainable water management</li> <li>• Energy Efficiency and Demand Side Management</li> <li>• Sustainable human settlements, the built environment and green buildings</li> <li>• Ecosystem services</li> </ul>

Funding window	Focus area
<p><b>Low carbon economy –</b> <i>strives towards a low carbon growth trajectory in line with national climate change policy principles.</i></p>	<ul style="list-style-type: none"> <li>• Energy efficiency</li> <li>• Renewable energy (excluding the REIPPPP under the Department of Energy)</li> <li>• Rural energy including off grid and mini grid</li> <li>• Biofuels</li> <li>• Sustainable transport</li> <li>• Industrial cleaner production and consumption projects</li> </ul>
<p><b>Environmental and natural resource management –</b> <i>the protection of biodiversity and securing the sustainable delivery of ecosystem services</i></p>	<ul style="list-style-type: none"> <li>• Investment (or Payment) for Ecosystem Services projects</li> <li>• Biodiversity benefiting businesses, including sustainable farming</li> <li>• Sustainable land use management and models</li> <li>• Rural adaptation projects and plans</li> </ul>

*Green Energy Efficiency Fund*

This R500m facility is the result of a partnership between The Industrial Development Corporation (IDC) and the German Development Bank (KfW). The facility provides funding for energy-efficiency and self-use renewable energy projects, including related equipment and technologies. The fund supports the IDC’s alignment to the Industrial Policy Action Plan (IPAP2) and the New Growth Path with specific focus on growing the Green Economy (IDC, undated).

The objective of the fund is to promote and support:

- Improved energy efficiency through reduced energy consumption, facilitating South Africa’s transition towards a low-carbon economy;
- Long-term enterprise competitiveness and job creation through energy savings;
- Support of self-use renewable energy technologies in South Africa; and
- Contribution to global climate protection, while supporting SA’s economic development and growth.

*SEFA Botata Facility*

During 2015, the DBSA’s Green Fund and the Small Enterprise Finance Agency (SEFA) partnered to create South Africa’s first Small Medium and Micro-Enterprises (SMME) green supply chain credit facility (SEFA Botata Facility) to provide working capital loan financing to small business enterprises in the green sector. These SMME’s usually struggle to obtain affordable financing from commercial banks. SCF Capital Solutions, a developmental finance fund management company, founded by experienced trade and supply chain finance bankers, was appointed as administrator of the credit facility.

Supply chain finance rely on technology-based business and financing processes that link the various parties in a transaction, i.e. the buyer, the seller and financing institution and as a result results in lower financing costs and improved access to finance for SMEs.

By focusing on the following priority sectors, the programme is expected to play an important catalytic role in growing the green economy in South Africa:

- Rural energy including mini-grid and off-grid
- Biogas and biofuels
- Sustainable water management
- Sustainable human settlements, the built environment and green buildings
- Industrial cleaner production and consumption
- Ecosystem services
- Solar water heating
- Sustainable Agriculture and Agri-processing

*Sustainable Affordable Housing Finance Facility*

A collaboration between Nedbank Corporate and Investment Bank (NCIB) and the Green Fund (administered by DBSA) has led to the launch of the R120m Sustainable Affordable Housing Finance Facility during March 2017. The facility is an example of Nedbank's Fair Share 2030 commitments, 'which is a strategic focus on channelling funding into projects with the highest possible potential of delivering sustainable benefits for all South Africans.'<sup>41</sup> One of the first projects funded by the facility, include a government subsidised low- income social housing development, resulting in below-market rentals. A key feature of this project is the inclusion of green building principles such as resource efficiency and energy efficiency. The market for resource-efficient affordable housing is expected to grow significantly, once the sustainability performance of existing projects is validated.

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<sup>41</sup> Manie Annandale, NCIB, 2017

*Estimating publicly-mobilised private finance for climate action in South Africa*

During 2017, the Trade and Industrial Policies Strategies (TIPS) and the Organisation for Economic Co-operation and Development (OECD) concluded a study, *Estimating publicly-mobilised private finance for climate action: A South African case study - environment working paper no. 125*. This study estimates and analyses publicly-mobilised private finance for climate action in South Africa, between 2010 and 2015. “The mobilisation effect of public climate finance on private finance is first estimated through an analysis and attribution of project-level co-finance data. A pilot-methodology (the investor perspective) then expands the analysis to also incorporate the mobilisation effect of financial support provided by South African and international policies in two sectors: renewable energy and energy efficiency.”<sup>42</sup>

Summary of findings of the study:

- an attribution of private co-finance according to the volume of public co-finance committed, indicates that domestic actors play the major mobilisation role. Between 2010 and 2015, South African public co-finance is estimated to have mobilised 64% out of a total of USD 10.1 billion (ZAR 95.4 billion), with loans being the primary mobilising instrument.
- International actors play a complementary mobilisation role through upstream fund-level investments and credit lines, although volumes are very limited compared to project-level private finance mobilisation. The authors do highlight the need for a comprehensive analysis to be conducted of the mobilisation effect of public finance across the financial value chain, as estimates of mobilisation through funds and credit lines are not necessarily additional to estimates of mobilised private finance at the project-level.
- Volumes of private finance mobilised by financial support through domestic policies (e.g. tax incentives) are estimated to considerably outweigh volumes of private finance mobilised by public co-finance for both renewable energy and energy efficiency. The authors caution that these results are context specific and cannot be generalized to other developing countries due to differences in the policy landscape.
- The mobilisation effect of public co-finance in the Renewable Energy sector was estimated at 18%, compared to 95% for Energy Efficiency, while the mobilisation effect of financial support via policies was 82% for Renewable Energy versus 5% for energy efficiency.
- The evidence suggests that climate-related international and domestic capacity building has had an indirect mobilisation effect on private investment. For instance, bilateral support for energy efficiency audit programmes helped to identify profitable investment opportunities in small and medium-sized enterprises, which have then benefited from tax incentives for energy efficiency improvements.
- In the water sector, incentives for climate adaptation-related private investment appear to be lacking, especially at the industry and household level. While financing is regularly raised for bulk water infrastructure, such projects fell outside the ambit of this analysis.
- The study provides a list of the climate relevant funds active in South Africa, “Table A6.1 Overview of climate-relevant funds active in South Africa and achieving first financial close between 2010 and 2015.”

The authors of the above study make the following observation, “the South African example points to the need to turn attention to mobilising private finance outside energy-related activities, including by empowering sub-national actors. As renewable energy projects become increasingly commercially viable, including as a result of domestic policies and technology cost reductions, public co-finance could be progressively redirected to play a more decisive risk-reducing role in other climate-related sectors. In South Africa, investments to adapt to the water-related effects of climate change could be unlocked by further mainstreaming climate change issues into national water policies.

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<sup>42</sup> OECD 2017, Estimating Publicly-Mobilised Private Finance For Climate Action: A South African Case Study - Environment Working Paper No. 125 by Lauren McNicoll and Raphaël Jachnik (OECD), and Gaylor Montmasson-Clair and Shakespear Mudombi, Trade & Industrial Policy Strategies (TIPS)

Further, financial incentives could be provided at the level of provinces or municipalities to households or enterprises for private investment in water conservation and demand management”.<sup>43</sup>

“To date, much of the discussion on adaptation finance has focused on integrating aspects of climate resilience into public sector budgeting and the allocation of international climate finance. It is however, through the integration of climate resilience aspects into the day-to-day decisions of private enterprises around the world, that the most significant adaptation potential in economic development can be achieved.

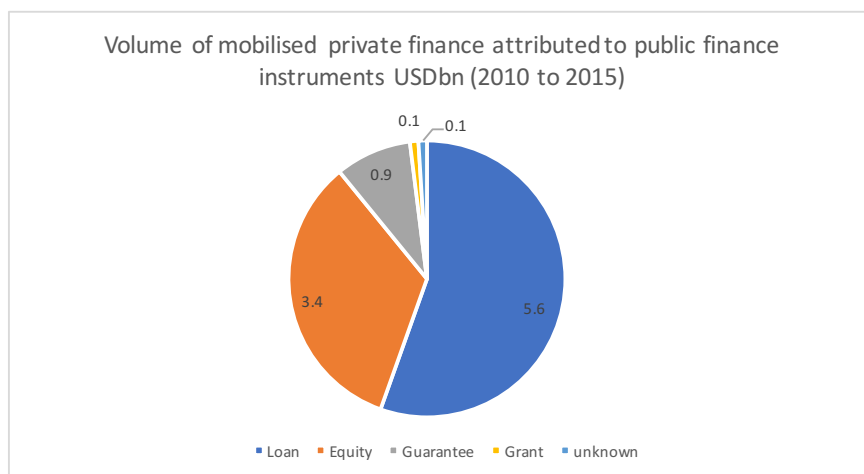
Understanding how these decisions are made and are ultimately financed is critical for establishing the policy frameworks capable to releasing that potential and, hence, scaling-up private sector investment, and financing, for adaptation to the transformational scale required” (Demystifying Adaptation Finance for the Private Sector, UNEP FI, 2016).

We draw the reader’s attention to potential limitations of the study as noted by the authors, in particular the assumption that project-level public co-finance fully mobilises private co-finance and that volume-based attribution is applied across all public finance instruments and providers.

#### Approach to funding and instruments used

The above study indicates that the REIPPPP played a dominant role in mobilising private finance for large-scale installations, whereas tax incentives for commercial greenfield and brownfield projects have been instrumental for energy efficiency. “Renewable energy-related public co-finance (equity, debt) and policy interventions (mainly the REIPPPP) were combined to jointly mobilise private finance for large-scale investments. In contrast, energy efficiency-related public interventions (public co-financing in the form of mainly loans and grants, as well as tax incentives) tended to each provide support to and mobilise private finance for different types and sizes of projects.” The above study also recognises that capacity building, provided by both international and domestic actors, has helped shape South Africa’s climate-related policy and industry context and has had an indirect effect on mobilising private sector finance.

The nature of instruments used, cover the traditional spectrum of instruments, including grants, equity, loans and guarantees. Below is the graphic representation of the volume of private sector finance attributed to public sector instruments<sup>44</sup>.



<sup>43</sup> OECD 2017, Estimating Publicly-Mobilised Private Finance For Climate Action: A South African Case Study - Environment Working Paper No. 125 by Lauren McNicoll and Raphaël Jachnik (OECD), and Gaylor Montmasson-Clair and Shakespear Mudombi, Trade & Industrial Policy Strategies (TIPS)

<sup>44</sup> As above

It is noted that the attribution to public finance instruments is volume-based. A comprehensive risk-based attribution methodology was not considered feasible by the authors of the study due to lack of detailed information related to the capital structure of the projects. Such a risk-based attribution methodology may yield different results when compared to the volume-based attribution methodology.



### Challenges of financing Climate Resilient Development

Key challenges<sup>45</sup> that has been identified in financing climate resilient development in South Africa, include:

- Local climate change responses to address the vulnerability of rural communities, are largely fragmented and lacking in scale.
- International funding used to supplement the municipal sources available, are ad-hoc in nature, since the predictability of climate finance is not yet secure, which made planning difficult.
- No formal public and transparent systems for tracking climate expenditure.
- Climate change competes with other priorities such as basic socio-economic and environmental issues.
- Climate action across the [respective sector] value chains were still uncertain and as such, accessing long-term decent jobs and the protection of enterprises remain a concern.
- The municipal revenue model also created a conflict of interest, as the bulk of municipal revenue is derived from electricity sales, resulting in a disincentive for emission reductions.
- A lack of knowledge on how to access international funds and leverage domestic sources in municipalities.
- The regulatory environment is limited. The Municipal Finance Management Act (MFMA) places limitations on municipalities in accessing climate finance, limiting climate action and financing by local government.

Proposed opportunities to mitigate or address these challenges include:

- Adopting a more strategic approach to climate finance access would help local government to leverage further funds from donors and development banks.
- Climate finance could be strengthened through tracking and monitoring the progress of climate change across all spheres of governance.
- A call for a revision of the intergovernmental grants for climate resilience and low carbon development through transformative approaches in order to improvements to national poverty, unemployment and inequality (the triple challenge).
- Alternative municipal revenue models should be considered, given the transformation that embedded electricity generation will bring.
- Interpretations of the regulatory framework, such as the MFMA, should be reviewed in light of the triple challenges (poverty, unemployment and inequality) and climate resilience.

From a private sector perspective, the NBI has noted the following five key barriers<sup>46</sup> to implementing adaptation planning in South Africa based on company responses: namely:

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

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<sup>45</sup> Parliamentary Monitoring Group, Committee on Environmental Affairs, Climate Finance Colloquium, 28 November 2017. The committee received contributions from several interested stakeholders, including DEA, One World, NBI, City of Cape Town, and the JSE.

<sup>46</sup> National Business Initiative, 2017, "A New Climate of Risk: How South African businesses are adapting to Climate Change"

Despite these barriers, the NBI highlights that a number of leading South African companies have applied innovative approaches to respond to climate change impacts by integrating adaptation planning into their risk management processes and supply chains, which have led to the identification cost reduction opportunities. The NBI categorised these emerging adaptation planning practices into the following four areas:

1. Companies are focused on good corporate governance of climate change and on integrating climate change into existing risk management systems.
2. Companies have turned climate risks into opportunities. This includes opportunities to strengthen customer, supplier and community relationships, as well as to develop new products and services.
3. Companies are recognising the benefits of collaborative partnerships. This includes the sharing of costs, expertise and resources to improve shared infrastructure, local capacity and disaster preparedness.
4. Companies are making informed decisions. The focus here is on undertaking climate-related vulnerability and risk assessments, including partnering with subject matter experts to understand company-specific climate impacts.

In an earlier study (2013), the NBI identified the following 11 barriers<sup>47</sup> faced by the South African private sector in accessing climate finance. The following high-level recommendations are provided by the NBI:

Barriers	Proposed interventions
<b>Policy-related</b>	
1. Misalignment between green economy vision, industrial policy and structure of the financial system	<ul style="list-style-type: none"> <li>• Reform the financial system to activate the sub-optimal segments in a way that serves the national vision of being a technology leader</li> <li>• Reform the nature of industrial and green economy policies in South Africa and their alignment to better suit the structure of the financial system</li> </ul>
<b>Structural</b>	
2. Financing early-stage, high risk projects and for moving projects from early development stages to commercialisation	<ul style="list-style-type: none"> <li>• There is a need to develop the venture capital (VC) industry in South Africa. Further research is required to better understand the VC industry and the best ways to unlock more capital flows from this sector.</li> <li>• Development of innovative financial instruments (such as off-balance sheet concessional finance) to improve the viability of mid-sized projects</li> <li>• managed process of dialogue between Commercial banks and DFIs, plus standardised measuring tools to enhance project selection, and accommodate differences in funding terms (tenure and instruments)</li> </ul>
3. Funding for mid-size projects	
4. Sub-optimal coordination between commercial banks and development finance institutions (DFIs)	
<b>Skills and capacity</b>	
5. Capacity constraints of implementation partners	<ul style="list-style-type: none"> <li>• A study is required to identify the most relevant implementing institutions for capacity building programmes</li> <li>• Capacity building programmes for project developers to increase their ability to turn potentially good project ideas into bankable plans</li> <li>• portion of DFI funding received by commercial banks for upskilling/training</li> </ul>
6. Project development skills shortages within project developers	
7. Project sourcing and evaluation skills shortages within commercial banks	
<b>Funding design</b>	
8. Limited focus on non-energy related low-carbon projects	<ul style="list-style-type: none"> <li>• Re-evaluating the methods of fund design to test for additionality and provide funding to sectors on a need-based approach</li> <li>• Develop a market aggregator, an institution that aggregates a number of projects that face similar transaction costs and improve their bankability by jointly addressing the hurdles. Further research is required to confirm the role and mandate of such an institution(s) in the South African context.</li> <li>• Stimulate competition amongst banks [the 4 large local banks] on the costs of funding and whether there is a need for active intervention in this area [e.g. to broaden the players in the project finance space]. Further research is proposed to understand the impact on such interventions on the banking sector.</li> </ul>
9. High transaction costs for commercial finance of low-carbon projects	
10. Design and structure of concessional credit lines	
11. Legislative barriers to investing in low-carbon projects	

<sup>47</sup> The NBI Climate Change Programme, 2013, A private sector view of enhancing private sector access to Climate Finance in South Africa. Technical support provided by KPMG.

### Finance incubators/laboratories

#### The Climate Finance Lab (The Lab)

The Lab is a public-private initiative composed of experts in sustainable investment from governments, development finance institutions, and the private sector. As an incubator, the Lab identifies, develops, and launches sustainable finance instruments that is aimed at facilitating and scaling investment into a low-carbon economy. It comprises several regional programs: the Global Innovation Lab for Climate Finance, the Brazil Lab for Green Finance, the India Innovation Lab for Green Finance and the FiRE awards.

#### *New class of instruments*<sup>48</sup>

The Lab has recently (2018) picked a new class of investment vehicles to drive much-needed finance to low-carbon, climate-resilient global development, out of over 100 ideas submitted into a competitive pool. “The nine new instruments tackle persistent investment barriers in clean energy, low-carbon transit, and sustainable land use in developing countries, with a specific focus on Brazil, India and sub-Saharan Africa.” (<https://www.climatefinancelab.org>)

Below is a summary of these funding vehicles under development<sup>49</sup>.

#	Name	Sector	Geography	Action type	Finance Mechanism	Instrument type	Stage/Status	Proponents/Partners
1	Distributed Energy for Social Housing	Buildings, Electricity / Power, Financial services, Urban development	Brazil	Mitigation	Fund/Finance Facility	Equity, Debt and guarantee	Concept in development	Endless AB, E-gás Ltda
2	Green Aggregation Tech Enterprise	Electricity / Power, Financial services	Africa	Mitigation	Fund/Finance Facility	Debt, Equity, Guarantee, Preparation-stage grant	Concept /In development	Africa GreenCo
3	Residential Rooftop Solar Accelerator	Electricity / Power	India	Mitigation	Enterprise	Debt, Preparation-stage grant, Other	Market testing	Sangam Ventures
4	Harvest Contract Vehicle for Smallholder Tree Financing	Forestry	Africa	Adaptation/ Mitigation	Fund/Finance Facility	Debt, Equity, Guarantee, Investment-stage grant, Preparation-stage grant, Other	Market testing	Komaza
5	Responsible Commodities Facility	Agriculture, Financial services, Forestry	Brazil	Adaptation/ Mitigation	Fund/Finance Facility	Debt, Other	Concept /In development	BVRio
6	The Socio-Climate Benefits Fund	Agriculture / Forestry	Brazil	Adaptation	Fund/Finance Facility	Debt, Equity, Investment-stage grant, Preparation-stage grant	Concept/ In development	Kaeté Investimentos
7	Financing for Low-Carbon Auto Rickshaws	Transportation	India	Mitigation	Fund/ Finance Facility	Debt, Equity, Guarantee	Market testing	Three Wheels United
8	Pay As You Save for Clean Transport	Electricity / Power, Transportation	Global	Mitigation	Fund/ Finance Facility	Debt, Guarantee, Investment-stage grant, Preparation-stage grant	Concept	Clean Energy Works
9	Long-Term Debt Facility for Traction Batteries	Transportation, Urban development	Asia/India	Mitigation	Fund/Finance Facility	Debt, Equity, Guarantee, Investment-stage grant, Preparation-stage grant	Concept	Mytrah NN4Energy

The following themes have emerged from the above short-listed finance concepts:

- Use of market aggregator mechanism to create scale, pool risk, reduce costs and improve project viability.
- Solutions that address the upfront infrastructure finance gap, by introducing credit-worthy third-party owners and or operators of infrastructure who, in turn, enter into long-term contracts with end-users.
- Risk transfer / reduction through the use of guarantees or appropriate risk allocation between the parties, which improves the risk-return profile of the investment and encourages private sector to investment.
- Blending of finance using a phased approach that apply concessional finance to initial, more risky pilot projects, with scaled-up follow-on investments that target commercial co-finance from private sector, once the concept is proven.
- Use of technology to drive operational efficiencies and improve viability of investments.
- Introduction of financial and non-financial incentives (e.g. training, access to networks or experience) to stimulate investment into alternative low-carbon investment options.

<sup>48</sup> <https://www.climatefinancelab.org>

<sup>49</sup> Refer to Annexure G for a brief summary of the individual short-listed finance vehicles, including key features

### Blended climate finance

According to the OECD and WEF definition, blended finance is “the strategic use of development finance for the mobilisation of additional commercial finance towards the Sustainable Development Goals (SDGs) in developing countries”.

“By using a combination of public and philanthropic concessional funding to leverage multiples of private investment, blended finance seeks to deliver both attractive returns to private investors and social and environmental impact to the public, bridging the gap to long-term commercial viability” (Bella Tonkonogy, January 2018).

Blended finance is not a new concept and has been successfully applied in the financial services and clean energy sectors. It is not a “one size fits all” solution, but is a proven concept/tool with the potential for further innovation, refinement and customisation, thus creating the opportunity to replicate and scale its application.

Blended finance typically deploys a combination of the following four instruments:

1. junior/subordinate capital (equity and debt);
2. guarantees and risk-insurance products;
3. donor-funded technical assistance facilities; and
4. design or preparation grant-funding.

Junior or subordinated capital and guarantees and risk-insurance instruments are traditional first-loss mechanisms, used by the public and philanthropic sector to either enhance the return of and/or de-risk investment opportunities to crowd-in private sector investors.

Technical assistance funding and design or preparation grant funding are typically aimed at improving a project’s probability of reaching financial close, instead of a direct investment in the capital structure of the project. According to a recent study<sup>50</sup>, 73% of blended finance deals deploy either a) junior/subordinate capital, b) a technical assistance facility, or c) both.

### Climate Investor One

Climate Investor One (CIO) is a relatively new blended finance, capital-recycling facility mandated with delivering renewable energy infrastructure projects in emerging markets through its contribution to each phase of a project’s lifecycle, from project development, construction and project operations.

CIO comprises three distinct, but interlinked, funds, with the following key features:

Name	Size (USDm)	Type	Source	Purpose
1. The Development Fund (High risk)	30	Debt	Donor Capital	Development loans to remove market barriers
2. Construction Equity Fund (Moderate - high risk)	a) 100 b) 200 c) 200	a) Junior equity b) Ordinary equity c) Senior equity	a) Donor Capital b) DFI and Commercial Investors c) Commercial and Institutional Investors, covered by a full Export Credit Agency Guarantee	Construction phase finance
3. Refinancing Fund (low risk)	500	Senior Debt	Institutional investors who do not want exposure to development /construction risk	Reduce Cost of Capital and optimise Funding structure of operational projects

Source: <https://www.climateinvestorone.com/nl/#>

<sup>50</sup> BSDC and Convergence, Working Paper: The state of blended finance, July 2017

## DBSA Climate Finance Facility Programme (CFF)

The DBSA submitted a funding proposal “DBSA Climate Finance Facility” to the GCF dated 29 March 2018. The DBSA Climate Finance Facility Programme<sup>51</sup> is a lending facility that aims to address market constraints and catalyse private sector funding for climate-related investments in the Southern African region. The lending facility proposes the use of a blended finance approach and will consist of credit enhancements focused on first loss or subordinated debt and tenor extensions to catalyse private sector climate investments.

Key features<sup>52</sup>:

- CFF Programme is intended to fill market gaps and crowd-in private investment, targeting commercially viable technologies that cannot currently attract market-related capital at scale.
- The focus is on infrastructure projects that mitigate or adapt to climate change
- The CCF utilises two main instruments: subordinated debt / first-loss and credit enhancements. These include tenor extension to projects that are commercially viable but are not currently being financed by the private sector banks.
- Projects must demonstrate that there is market interest and that projects are technically and economically feasible, with limited private capital available due to specific financing gaps and barriers.
- Developers will have to show financial participation by one or more private sector parties and demonstrate that the project cannot be fully financed by the private sector.
- The projects must have some transformative effect on markets in terms of scale, improved private sector participation, confidence in clean energy investments, or other aspects.

There is a potentially significant role for blended finance in crowding in private sector finance at scale, especially in respect of low-carbon infrastructure projects or nascent green-tech industries. The use of concessional finance (grants, credit enhancement, guarantees, etc.) alongside public and private sector funding will go a long way in ramping up investment in sectors traditionally considered to be less attractive or riskier, e.g. water sector, waste treatment and energy efficiency. Blended finance may be used (for a limited period) to support the establishment of new or emerging low-carbon markets/technologies.

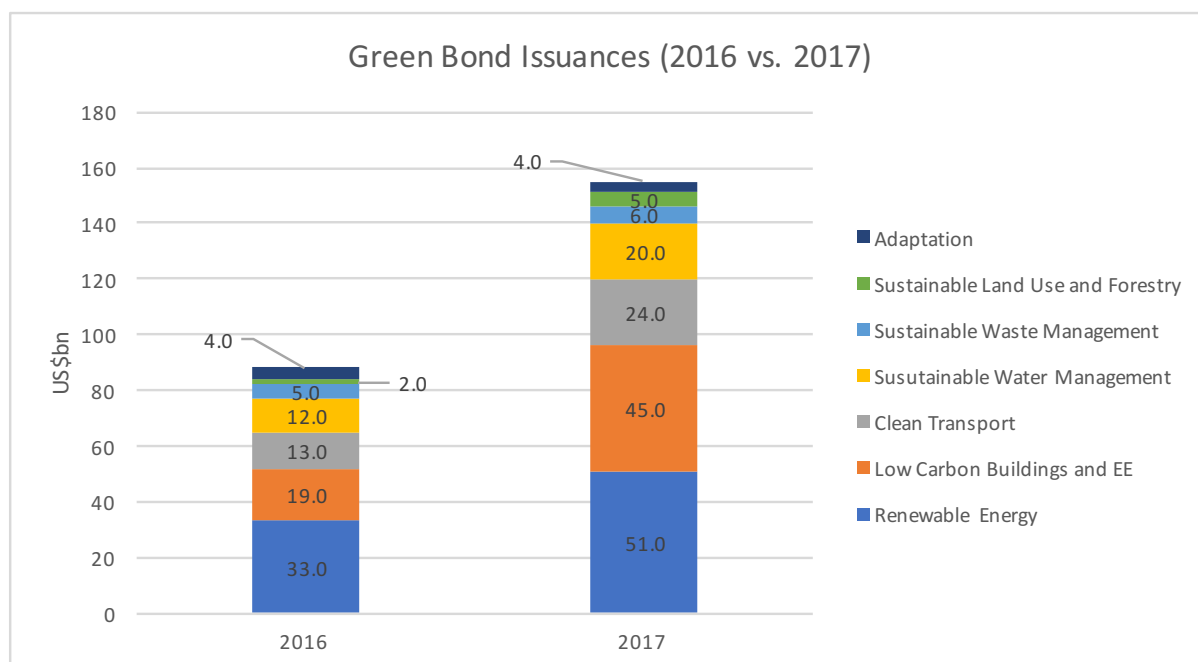
<sup>51</sup> Meeting of the Board - GCF/B.20/10/Add. 09 - 8 June 2018

<sup>52</sup> GCF/B.20/10/Add. 09 - 8 June 2018, Project/Programme Summary, pg4

## Green Bonds

### Global trend

According to the Climate Bond Initiative (CBI), new issuance of green bonds reached USD150bn in 2017, an increase of 78% on the USD87bn issued in 2016. While the US dominated the 2017 issuance, followed by France and China, other emerging countries are showing encouraging signs of growth. A total of 239 issuers participated in the market in 2017, with 61% (146) making their debut. Renewable Energy and Low Carbon Buildings & Energy Efficiency are receiving the lion’s share of investment from Green Bond proceeds, followed by Clean Transport and Sustainable Water Management, as shown in the graph below.



Source: CBI, Green Bond Highlights, 2017 (adapted)

The number of instruments included in Green Bonds are expanding. For example, the first Green Sukuk (Islamic Finance) was issued in 2017.

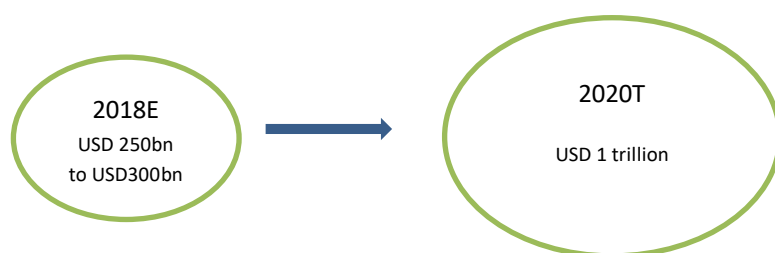
According to CBI, the 2018 outlook for Green Bonds is as follows:

- Green bond issuances are expected to reach between USD250bn and USD300bn in 2018.<sup>53</sup>
- More sovereign issuances from developed and developing countries are expected to finance climate resilient infrastructure and to meet NDC commitments.
- Further progress is expected on harmonising international standards and definitions for green bonds
- Further growth in Green Bond issuances will be driven by sub-sovereign issuers, e.g. municipalities and cities.
- Regulators will continue to innovate with more guidelines and regulations and possible incentives, such as lowering the cost of capital for lending against energy efficient buildings and electric cars.
- Greater pressure on the banking sector to raise the level of green lending as well pressure from investors, encouraging large corporate emitters to shift from brown to green financing.

<sup>53</sup> <https://www.reuters.com/article/greenbonds-issuance/global-green-bond-issuance-hit-record-155-5-billion-in-2017-data-idUSL8N1P5335>

The CBI’s annual conference in London (Jan 2018) launched a new campaign (“The Green Bond Pledge”), calling on the public and private sector, globally, to align its capital expenditure programs with climate and emissions goals. The Green Bond Pledge seeks to have cities, public authorities and the world’s largest corporate organizations commit to increase their use of green bond finance so that new infrastructure meets the challenges of climate change. The declaration was created to reinforce the goals of the Paris Agreement. The target is to reach Green Bonds issuance of S\$1 trillion by 2020.

Expected and targeted Green Bond Issuances



Source: Reuters and CBI

According to CBI’s Chief Executive, Sean Kidney, “The spotlight is now firmly on financial system actors, banks, insurers, corporate entities and institutional investors to achieve this vital 2020 climate investment”.

Green Bond Market in South Africa

Green Bonds in South Africa has started to take off. South Africa’s first green bond was launched by the Industrial Development Corporation in 2012. This was followed by the City of Johannesburg, the first local municipality to list a green bond on the JSE in 2014. The City of Cape Town launched its green bond in July 2017, while Growthpoint Properties became the first South African company to issue a green bond during March 2018.

The below table provides relevant details related to these South African green bond issuances.

Name of Issuer	Size (Rbn)	Year	Purpose
1. The Industrial Development Corporation	5	2012	To finance clean energy infrastructure
2. The City of Johannesburg	1.5	2014	To finance biogas to energy and the Solar Geyser Initiative
3. The City of Cape Town	1	2017	To fund projects aligned to the City’s Climate Change strategy, including electric buses, energy efficiency in buildings and measures to address water resource management and long-term water security
4. Growthpoint Properties	1.1	2018	To fund green buildings and green initiatives of South Africa's leading REIT

Source: V-LED, 2018<sup>54</sup>

<sup>54</sup> Input Paper: V-LED Africa Workshop, 23-25 April, 2018, Climate Finance in South Africa by One World Sustainable Investments, Sustainable Energy Africa and adelphi

The Johannesburg Securities Exchange (JSE) launched its Green Bond Segment in late 2017. Its Green Bond platform seeks to unlock the investment potential of green infrastructure, technologies and services and to build trust and assurance around the environmental credentials of the bonds, by developing clear green bond qualification criterion. The proceeds of Green Bonds are exclusively used for the financing or re-financing of new or existing eligible green projects that have a positive environmental and/or climate benefit.<sup>55</sup>

The JSE's green bond platform is built on the following framework:

- Research into international best practice;
- Considering local needs and possible pro's and cons of various frameworks
- Stakeholder engagement (issuers, investors, government, auditors, etc.)
- Non-negotiables:
  - Credibility in terms of "green credentials"
  - Clarity in respect of practical application of Green Bond principles
  - Monitoring and reporting requirements (disclosure

Green bonds offer a significant opportunity (especially at provincial and municipal level) to mobilise large amounts of private capital earmarked for low-carbon, climate resilient investments. As market actors continue to innovate in this area, the review of green bond regulations and incentives and the harmonization of standards become critical.

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<sup>55</sup> JSE, 2017



### Green Outcomes Based Fund (GOF)

The GOF<sup>56</sup> is an innovative finance structure, and a first of its kind in South Africa, aimed at encouraging local South African fund managers to increase investment in green Small and Growing Businesses (SGBs) by paying for pre-agreed green outcomes, such as (amongst others) green job creation, climate change mitigation and improved water and waste management.

The GOF seeks to address key bottlenecks in the South African green economy<sup>57</sup>, by:

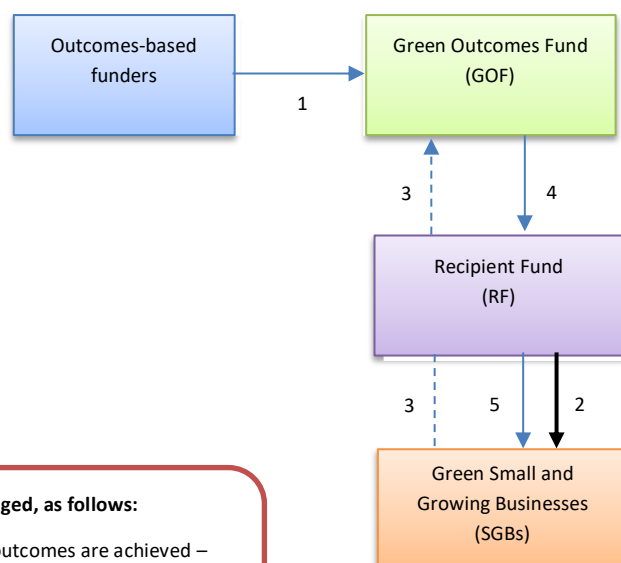
- Stimulating local investor interest in green SGB investments, by subsidizing investments;
- Paying for successful business development support;
- Involving local investment community in accessing and growing green SGBs;
- Reducing the high start-up costs associated with innovative (green) strategies;
- Supporting the sourcing of green SGBs (SGB pipeline) through partners; and
- Providing technical support and knowledge sharing on green economy issues.

“The GOF provides outcomes-based matched concessionary capital to existing and emerging local investment funds to promote investments in green SGBs in South Africa. The GOF [pilot] tests whether an outcomes-based payment model can catalyze additional local investment in green SGBs, and ultimately further the development of a robust green impact investment industry in South Africa. For funders, it creates a market for pre-agreed, verified green outcomes.” (Green Outcomes Fund: Information Deck, 2018 Update)

Key features of the GOF structure:

**Process:**

1. Outcomes based funders transfer grants to GOF
2. RF invests in SGBs using its own match funding and provides support to SGBs (the leverage ratio of match funding will be tailored to each RF).
3. SGBs create green outcomes reports to RF and RF reports outcomes to GOF
4. GOF disburses payments for pre-agreed green outcomes achieved and verified
5. RF invests in SGBs to create additional green outcomes using GOF funding and match funding



**Two outcomes-based payment models are envisaged, as follows:**

1. Payments are only accessible once the agreed outcomes are achieved – this is suited to mid-sized RFs with secured match funding
2. Partial upfront payment, which is suited to emerging RFs seeking to raise capital. The balance of grant funding is released when agreed outcomes

Source: Green Outcomes Fund: Information Deck, 2018 Update (adapted)

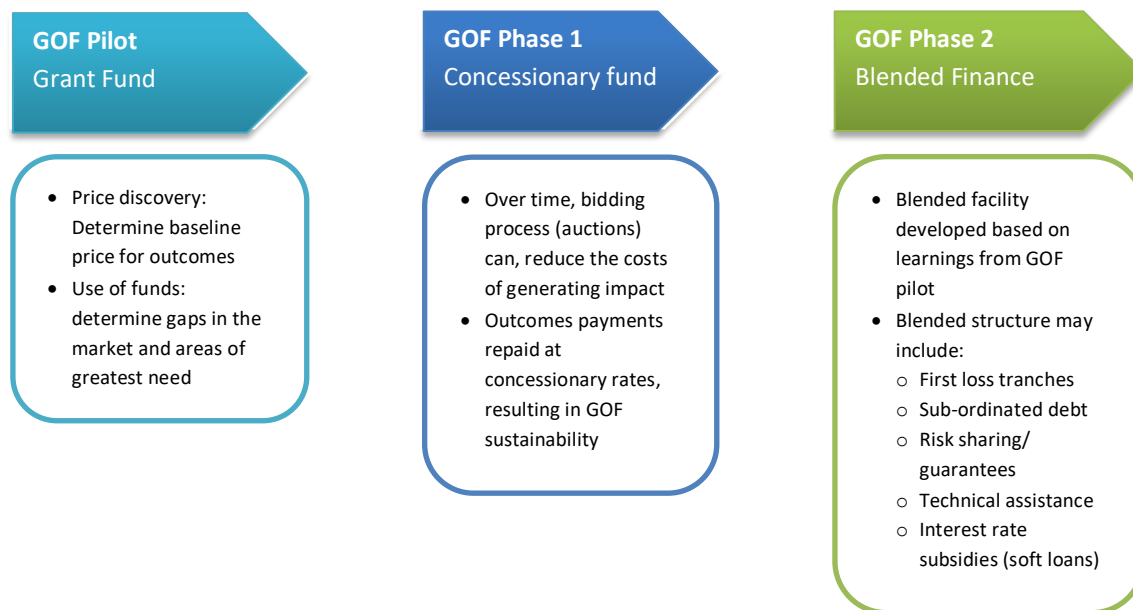
<sup>56</sup> The GOF is implemented in partnership with the World Bank Group, World Wide Fund for Nature South Africa (WWF-SA), Greencape and UCT GSB’s Bertha Centre for Social Innovation and Entrepreneurship.

<sup>57</sup> Green Outcomes Fund: Information Deck, 2018 Update

The GOF is in the process of raising the initial funding of R20m (USD1.7m) for the pilot programme, followed by a market launch during the period Q4 2018 and Q1 2019. The pilot is expected to run for a period of three years (2019 to 2021), with the potential to extend for an additional 12 months.

All targeted investment funds have signed Letters of Interest (LoI) confirming their intention to participate in the GOF, with six potential Recipient Funds being selected for the pilot, following initial due diligence and establishing the track record of the fund and/or team.

The envisaged evolution of the GOF is shown below:



Priority investment areas for mobilising and scaling private sector finance in support of South Africa's NDC.

"The government is committed to substantive engagement and, where appropriate, partnerships with stakeholders from industry, business, labour and civil society in a manner that enhances coordination."

"Government also recognises the importance of private sector funding in achieving national climate change response actions and will work with the financial sector to explore the most appropriate mechanisms to achieve efficient funding flows." (NCCRP, 2011)

"The Priority Flagship Programmes are South Africa's response to implementing climate action at scale and provide the greatest opportunity for attracting, mobilising and leveraging investment from both the private and public sectors towards South Africa's Nationally Determined Contribution" (DEA, 2018).

In light of the above, the thematic areas (sectors and or sub-sectors) targeted by the priority Climate Change Flagship Programmes, represent a logical starting point to explore priority investment areas for mobilising private sector investment and finance at scale in support of South Africa's NDC.

In order to identify the initial priority investment areas for the private sector, the following factors were considered on a subjective basis (based on general observations from the literature review and to a lesser extent, insights from selected interviews):

- Local needs in terms of economic development priorities (employment creation, poverty reduction, inclusive and sustainable economic growth, reducing income inequality)
- Private sector investment drivers, such as, revenue and/cashflow potential, existing or evolving business models, public sector support (co-financing/incentives);
- Relative maturity of the sector or sub-sector and/or relative readiness to scale, in terms of:
  - Enabling environment and/or potential for reasonable progress towards an enabling environment;
  - Existing and/or emerging technologies and/or financing solutions
- High-level fit in terms of the GCF investment criteria and results areas; and
- Potential for using de-risking financial instruments to catalyse the investment.

On the basis of the above, the following 5 sectors<sup>58</sup> (in no specific order of priority) have been selected as priority sectors for mobilising private sector funding for mitigation and adaptation projects.

1. Energy;
2. Waste;
3. Water;
4. Agriculture; Food Systems and Food Security; and
5. Low Carbon Climate Resilient Built Environment, Communities and Human Settlements.

It is noted that other sectors, not included in the above shortlist, may well offer significant potential for private sector investment, for example the Transport Sector. The author also recognises the interdependence between sectors with respect to cross-cutting climate action, for example building low-carbon climate resilient cities, require integration across multiple sectors, such as Energy (Renewable Energy and Energy Efficiency), Waste, Water and sustainable transport systems and infrastructure, amongst other.

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<sup>58</sup> A high-level overview of the five sectors, including opportunities and barriers are provided in Annexure F.

The tables<sup>59</sup> below summarise the initial 15 sector-based priority investment projects relevant to the private sector, including, potential drivers of investment, national development priorities and potential public and private sector actors or stakeholders.

This is followed by a mapping of the priority investment areas to the GCF results areas and investment criteria, and national development priorities<sup>60</sup>; as well as a summary of the type of support that may be required from the GCF, including access modality and possible areas where the GCF's concessional funding /support would benefit the projects.

Finally, a high-level summary of the risks and barriers per investment area is provided.

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<sup>59</sup> Source: Compiled by author, based on literature review and limited interviews

<sup>60</sup> Three development priority areas were subjectively selected, based on the themes of (i) socio-economic inclusion/inclusive growth, (ii) increase in employment/poverty reduction and (iii) sustainable economic growth/green economy.

Sector	Sub-sector/sub-category	Project / Intervention	Mitigation /Adaptation	Potential drivers of private sector opportunity	Development priority	Key public sector actors	Potential private sector actors
1. Energy	Energy Efficiency	Energy Efficiency in Public Infrastructure and Buildings	Mitigation	Potential for ESCO market, Potential de-risking instruments Public sector co-finance and Incentives	Employment Sustainability economic growth	DoE, DPW DBSA IDC NCPC	NBI and Carbon Trust GBCSA ESCOs Technology companies Consultancies Commercial banks Debt Funds
		Energy Efficiency Private sector (industrial/commercial) and Households	Mitigation	LT Cost saving Business sustainability Incentives			
	Renewable Energy	Small Scale Embedded Generation	Mitigation	Proven and emerging technologies Evolving business models for Decentralised Electricity Enabling regulations exist and being refined Municipal systems and processes are evolving rapidly		DoE/NERSA AMEU/SALGA Municipalities/Eskom DBSA	High energy users (commercial and Industrial) Decentralised Energy Companies/EPC Commercial Banks Investment Funds/Private Equity
		Renewable Energy Generation by Independent Power Producers (IPP), based on non-sovereign-backed Power Purchase Agreements)	Mitigation	Proven technologies Tested procurement process Scalability Potential market for local manufacturing		DoE/NERSA ESKOM DTI DBSA	RE Developers and Sponsors and EPC Local Off-takers Insurers SAPVIA/SAWEA, Commercial Banks Institutional Investors
2. Waste	Waste to Energy	Waste to Energy (Biogas/Incineration)	Mitigation	Proven and emerging technologies. Potential for Build, Operate and Own (BOO) model or BOT model Incentives	Employment Sustainability economic growth Sustainable Cities	DEA Municipalities DBSA Greencape	Consultancies Waste Management Services Companies Technology suppliers Commercial Banks Investment /Private Equity Funds
	Waste Diversion/recycling	Diversion of solid waste from Landfil / Material Separation Facility/at source	Mitigation	Recycling value chain, Build Operate Transfer (BOT) PPP model		DEA Municipalities DBSA Greencape	Consultancies Waste Management Service Companies Commercial Banks Investment/Private Equity Funds

Sector	Sub-sector/sub-category	Project / Intervention	Mitigation /Adaptation	Potential drivers of private sector opportunity	Development priority	Key public sector actors	Potential private sector actors
3. Water	Water resource development	Renewable Energy desalination plants	Adaptation	Potential for Build, Own, Operate and Transfer (BOOT) model (desalination) Technology exists and evolving Rising costs and scarcity (Business/economic risk) Consumer demand (especially industry) Potential for public sector co-finance	Employment Sustainability economic growth	DWS DPW Municipalities (WSA) Water Catchment Agencies (WCA) Greencape DBSA/IDC Development Finance Institutions (Other)	Consultancies Water service companies Technology suppliers Engineering, Procurement and Construction (EPC) Commercial banks Infrastructure funds
	Water infrastructure operations, maintenance and rehabilitation	Public Private Partnership (PPP) to rehabilitate, operate and maintain public water infrastructure	Adaptation	PPP model established Technology exists and evolving Potential to monetise non-revenue water Water security (reduce water loss) Improved water service delivery Potential for public sector co-finance			
	Water Harvesting	Commercial/Industrial water harvesting	Adaptation	Bankable opportunities, based on water use requirements Rising costs and scarcity (Business/economic risk)			
	Wastewater treatment and Wastewater to energy	Industrial water reuse, recycling and recovery	Adaptation	Advanced technologies available & evolving Rising costs and water security (Business sustainability) Consumer demand (especially industrial/commercial) Compliance requirements Potential local market for equipment and product manufacturing and related services BOOT model possible			
Wastewater Biogas to electricity		Mitigation	Technology is available Potential for industrial symbiosis Potential of Bio-Energy in Waste water (Energy Security) Sustainability (cost saving)				

Sector	Sub-sector/sub-category	Project / Intervention	Mitigation /Adaptation	Potential drivers of private sector opportunity	Development priority	Key public sector actors	Potential private sector actors
4. Agriculture, Food Systems and Food Security	Climate Smart Agriculture (incorporating weather, water, seeds/varieties, nutrients/markets)	Conservation Agriculture Energy Efficiency and water efficiency in Agriculture	Adaptation and Mitigation (Cross-cutting)	Economic and environmental benefits Resource Efficiency (reduce inputs and increase productivity) Economic/ Business sustainability Energy security/Water security	Employment and Poverty reduction Sustainable /inclusive economic growth Reduce inequality	DAFF DRD&LR DEA DWS Land Bank DBSA/IDC Development Finance Institutions (Other)	Producers/Farmers (Commercial/small scale) Co-operatives/Community structures Research institutions and Industry associations ITC companies/Technology suppliers (Green tech) Consultancies Commercial Banks Investment /Private Equity
	Agri-Processing, productions and related foods systems	Controlled Environment Agriculture/Precision Agriculture (Greentech/ICT solutions)  Energy Efficiency/Renewables (Irrigation, Packhouses, cold stores/cellars)  Agri-parks (agri-production and agri-processing) and Special Economic Zones (SEZ) for Greentech		Existing and emerging technologies (drones/mobile apps, etc/precision farming) Economic/ Business sustainability Resource Efficiency (reduce Energy and other input costs and increase productivity) Water security			
5. Low Carbon Climate Resilient Built Environment and Human Settlements	Green buildings / human settlements / infrastructure	Green buildings for social, low-income housing (RE/EE, Water and Waste Management, sustainable building materials).	Cross-cutting	Social housing demand exceed supply Commercial Banks have appetite for funding, subject to appropriate incentives, subsidies Contribution to socio-economic development	Employment, poverty alleviation and addressing inequality Sustainable /inclusive economic growth	DRD&LR DHS Municipalities	GBCSA Property developers Companies along the construction sector value chain Commercial Banks Impact Funds





Types of support, financial instruments and access modality required to catalyse private sector investment

The below tables provide an indication of the types of concessional support, financial instruments and access modalities for the respective subsectors and / projects.

Sector	Subsector/ sub-category	Projects	Potential GCF contribution areas								
			Type of support			Instruments					Possible access modality and related observations
			Financial	Policy/ Regulatory	Technical capacity	Grant	Equity	Concessional loans	Guarantee/ Insurance		
1. Energy	Energy Efficiency	Energy Efficiency in Public Infrastructure and Buildings Programme (EEPIBP)	✓	✓	✓	✓		✓	✓	<p><b>Direct Access: GCF proposal (Grants, Credit Enhancement/Guarantee Facility)</b></p> <p>Need for concessionality: Project Preparation / First loss / guarantee facility to crowd-in commercial and other lenders. Concessional loans to reduce potential funding gaps. Support the development of the ESCO market in SA</p> <p>Note: The EEPIBP has applied for project development and implementation funding from the NAMA Facility for initial phase (5 years). The funding application is in the final stages of approval.</p>	
		Energy Efficiency Private sector (industrial/commercial)									
	Energy Generation	Small Scale Embedded Generation	✓	✓	✓	✓			✓		Refer to comment below for the Waste and Water Sector projects
		Renewable energy based on Non-sovereign-backed Power Purchase Agreements	✓	✓					✓		<p><b>Direct Access: GCF proposal (DBSA's proposed Credit Enhancement Facility for non-Sovereign-backed PPAs)</b></p> <p>Need for concessionality: First loss /guarantee facility (credit enhancement facility) to address risk of Offtaker default and thereby crowd-in commercial and other lenders.</p>
2. Waste	Waste to Energy	Waste to Energy (Biogas/Incineration)	✓		✓	✓		✓	✓	<p><b>Direct Access: GCF proposal (DBSA - Climate Finance Facility)</b></p> <p>GCF's concessionality needed for:</p> <ul style="list-style-type: none"> <li>Developing innovative financing mechanisms</li> <li>Addressing high capital cost that are slowing the uptake of these mitigation and adaptation projects</li> <li>Reducing cost of borrowing (especially for MSMEs), by offering lower interest rates and/longer tenors                             <ul style="list-style-type: none"> <li>Blending the GCF funding with private investor funding, to lower the overall risk exposure for the private funder.</li> </ul> </li> </ul>	
	Waste Diversion/recycling	Diversion of solid waste from Landfil / Material Separation Facilities/at source	✓		✓	✓		✓	✓		
3. Water	Water resource development	Renewable Energy desalination plants (seawater, brackish water/other)	✓		✓	✓		✓	✓		
	Water infrastructure operations, maintenance and rehabilitation	Public Private Partnership (PPP) to rehabilitate, operate and maintain public water infrastructure	✓		✓	✓		✓	✓		
	Water Harvesting	Commercial/Industrial water harvesting	✓			✓					
	Wastewater treatment and Wastewater to energy	Industrial water reuse, recycling and recovery		✓			✓		✓		
Wastewater Biogas to electricity			✓	✓	✓		✓	✓			

Source: Compiled by author

Sector	Subsector/ sub-category	Projects	Potential GCF contribution areas								
			Type of support			Instruments					Possible access modality and related observations
			Financial	Policy/ Regulatory	Technical capacity	Grant	Equity	Concessional loans	Guarantee/ Insurance		
4. Agriculture, Food Systems and Food Security	Climate Smart Agriculture (incorporating weather, water, seeds/varieties, nutrients/markets)	Conservation Agriculture (Climate Smart Agriculture)	✓	✓	✓	✓		✓	✓	<p><b>Direct Access: GCF Proposal (Land Bank, in the process of GCF accreditation), SANBI (Adaptation grants only)</b></p> <p>GCF's concessionality is needed for:</p> <ul style="list-style-type: none"> <li>• Developing skills and expertise in Climate Smart Agriculture and related systems</li> <li>• Developing skills and expertise in Agri-processing, production systems, market access, logistic and extension services) in the context of Agri-parks and / special economic zones</li> <li>• increasing financial literacy (especially amongst smallholder farmers and SMMEs) and awareness of tailored financial products</li> <li>• Developing tailored financial solutions (Insurance/mobile money/working capital, etc) in collaboration with commercial banks/DFI, especially for smallholder farmers and SMMEs</li> <li>• Addressing upfront capital cost (required to adapt to climate change) that is slowing the uptake of these mitigation and adaptation projects</li> <li>• Reducing the cost of borrowing (especially for MSMEs), by offering lower interest rates and/longer tenors                             <ul style="list-style-type: none"> <li>• Blending the GCF funding with other development finance, to lower the overall risk exposure for the private funders.</li> </ul> </li> </ul>	
		Controlled Environment Agriculture/Precision Agriculture (Greentech/ICT solutions)									
		Energy Efficiency/Renewables (Irrigation, Packhouses, cold stores/cellars)	✓	✓	✓	✓		✓	✓		
	Water conservation and water management										
	Agri-Processing, productions and related foods systems	Agri-parks (agri-production and agri-processing) and Special Economic Zones (SEZ) for Greentech	✓	✓	✓	✓		✓	✓		
5. Low Carbon Climate Resilient Built Environment and Human Settlements	Green buildings / human settlements / infrastructure	Green buildings for social, low-income housing (RE/EE, Water and Waste Management, sustainable building materials).	✓		✓	✓		✓	✓	<p><b>Direct Access: GCF proposal (Green Outcomes Fund)</b></p> <p>Concessional funding and support are needed for:</p> <ul style="list-style-type: none"> <li>• Supporting awareness of green building certification</li> <li>• Supporting development of green building MRV Framework and pilots                             <ul style="list-style-type: none"> <li>• Capacity building in public sector, especially around human settlement planning</li> </ul> </li> <li>• Addressing higher up-front capital cost for green buildings in order to encourage the uptake of mitigation and adaptation elements of green buildings</li> <li>• Blending the GCF funding with other FDI finance, to reduce project costs and or lower interest rates in order to lower the bond costs/rentals</li> </ul>	

Source: Compiled by Author

High-level risks and barriers related to proposed private sector priority investment areas

Sector	Project / Intervention	Potential barriers or risks to private investment
1. Energy	Energy Efficiency in Public Infrastructure and Buildings	<ol style="list-style-type: none"> <li>1. Cost of investigations (particularly in the private sector) is prohibitive</li> <li>2. Low level of awareness of EE tax incentives resulting in low access levels for incentives</li> <li>3. Investment in EE management and systems resources are low, resulting lower uptake of EE targets</li> <li>4. High costs of energy audits to determine feasibility of projects and high M&amp;V costs for accessing incentives also limit the market growth</li> <li>5. Long-term energy contracts between Escos and their clients are difficult to secure, increasing the risk profile and bankability of projects</li> </ol> <p><i>Source: DBSA GCF proposal (CFF), 2018</i></p>
	Energy Efficiency Private sector (industrial/commercial) and Households	
	Small Scale Embedded Generation	<ol style="list-style-type: none"> <li>1. Uncertainties in market rules and regulations (including tariff uncertainty)</li> <li>2. Early stage / nascent segment of the market</li> <li>3. No guaranteed payments for Residential SSEG</li> <li>4. Borrowing costs are relatively high and loan tenors are well below the useful life of the assets</li> <li>5. Eskom Time-of Use tariff structure does not suit Solar PV installations, because Solar PV production falls outside peak times.</li> </ol> <p><i>Source: DBSA GCF proposal (CFF), 2018</i></p>
	Renewable Energy Generation by Independent Power Producers (IPP), based on non-sovereign-backed Power Purchase Agreements)	<ol style="list-style-type: none"> <li>1. Regulatory uncertainties and restrictions (licencing, tariffs)</li> <li>2. Commercial lenders will require credit guarantee to protect against potential off-taker default.</li> </ol>
2. Waste	Waste to Energy (Biogas/Incineration)	<ol style="list-style-type: none"> <li>1. Inadequate source separation, resulting in contaminated feedstock</li> <li>2. Contaminated recyclables, means higher investment in waste removal equipment</li> <li>3. In ability to police separation at source</li> <li>4. Small scale Biogas may not be financially viable</li> <li>5. Access to e-waste</li> <li>6. Market for certain plastic recyclables is believed to be saturated.</li> </ol> <p><i>Source: Greencape (2018)</i></p>
	Diversion of solid waste from Landfill / Material Separation Facility/at source	

Sector	Project / Intervention	Potential barriers or risks to private investment
3. Water	Renewable Energy desalination plants	<ol style="list-style-type: none"> <li>1. High upfront capital requirements</li> <li>2. Brine discharge from desalination plants</li> <li>3. Long-term demand risk</li> </ol> <p><i>Source: Greencape</i></p>
	PPPs to rehabilitate, operate and maintain public water infrastructure	<ol style="list-style-type: none"> <li>1. Water sector investments traditionally viewed as low-return, high-risk and plagued by political interference.</li> <li>2. Water is not accurately priced (not cost-reflective), which impact financial viability of projects</li> <li>3. Poor collection record of municipalities/level of indebtedness limits access to finance</li> <li>4. Lack of technical and leadership skills in public sector</li> <li>5. Lack of understanding of project finance and/or infrastructure finance</li> <li>6. Lack of skills in financial sector to evaluate water sector projects</li> </ol> <p><i>Source: Greencape (2018), NBI (2018)</i></p>
	Commercial/Industrial water harvesting	<ol style="list-style-type: none"> <li>1. Regulatory requirements in respect of water quality needs to be considered</li> <li>2. Availability of land/space for infrastructure or equipment</li> </ol>
	Industrial water reuse, recycling and recovery	<ol style="list-style-type: none"> <li>1. Negative perceptions about reused/ recycled water</li> <li>2. Large upfront capital requirements;</li> <li>3. Policy and regulation on implementing water reuse technologies on-site in certain processes (e.g. product contact for food and beverages)</li> <li>4. Limited incentives for industry to invest in water treatment and reuse systems beyond the price mechanisms.</li> <li>5. Lack of awareness of water recycling technologies amongst SMME, slows the rate of uptake of these technologies</li> </ol> <p><i>Source: Greencape, 2018</i></p>
	Wastewater Biogas to electricity	<ol style="list-style-type: none"> <li>1. Regulatory requirements (air permits)</li> <li>2. Inadequate payback for smaller projects</li> <li>3. Shortage of technical skills (operations and maintenance)</li> </ol>

Sector	Project / Intervention	Potential barriers or risks to private investment
<b>4. Agriculture, Food Systems and Food Security</b>	Conservation Agriculture Energy Efficiency and water efficiency in Agriculture	1. A lack of awareness of the importance and benefits of sustainable production, and what is available, specifically in terms of advice and technologies. 2. Seasonal production of commodities, which impacts the return on investment and payback period. 3. Lack of support for farmers to help them access relevant information and advice on best practice. 4. Regulatory hurdles, e.g. complicated processes and delays in carrying out EIAs. 5. Weak exchange rate and low profit margins result in imported technologies being too expensive for farmers. 6. A lack of funding for R&D. International benchmark, R&D expenditure as a percentage of GDP 1% vs. <0.8% in SA. 7. Policy uncertainty in respect of land rights and land expropriation 8. Upfront capital costs for investment in new machinery (due to CA) and energy efficiency and water efficiency/recycling initiatives  <i>Source: Greencape, 2018</i>
	Controlled Environment Agriculture/Precision Agriculture (Greentech/ICT solutions)	
	Energy Efficiency/Renewables (Irrigation, Packhouses, cold stores/cellars)	
	Water Efficiency	
	Agri-parks (agri-production and agri-processing) and Special Economic Zones (SEZ) for Greentech	
<b>5. Low Carbon Climate Resilient Built Environment and Human Settlements</b>	Green buildings for social, low-income housing (RE/EE, Water and Waste Management, sustainable building materials).	1. Uncertainty around land rights and expropriation may delay property related development 2. 1. See EE above.

Compiled by author

**Priority investment areas for mobilising private sector finance in support of South Africa’s NDC**

The government’s Climate Change Priority Flagship Programme was used as the starting point for identifying potential high-impact investments or projects for mobilising and scaling private sector finance in support of South Africa’s NDC. Consideration was given to government-led climate actions as well as literature related to the private sector’s climate change response and opportunities, such as the work done by the National Business Initiative related to the green economy and the water sector and the Greencape’s analysis of the energy efficiency, water and waste sectors.

An initial list of five sectors and 15 priority investment areas (projects /interventions) for the private sector was identified, based on the subjective evaluation of the following factors:

- Potential socio-economic development impact;
- Private sector investment drivers, such as, Revenue and/cashflow potential, public sector support (co-financing/incentives);
- Relative maturity of the sector or sub-sector and/or relative readiness to scale, in terms of:
  - Enabling environment and/or potential for reasonable progress towards an enabling environment;
  - Existing and/or emerging technologies, business models; and/or financing solutions
- High-level fit in terms of the GCF investment criteria and results areas; and
- Potential for using de-risking financial instruments to catalyse the investment.

The prioritised sectors and related projects for mobilising and scaling private sector funding are shown below:

Sector	Subsector/ sub-category	Projects / Investment Areas
<b>1. Energy</b>	Energy Efficiency	1. Energy Efficiency in Public Infrastructure and Buildings
		2. Energy Efficiency Private sector (industrial/commercial) and Households
	Energy Generation	3. Small Scale Embedded Generation
		4. Renewable energy based on Non-sovereign-backed Power Purchase Agreements
<b>2. Waste</b>	Waste to Energy	5. Waste to Energy (Biogas/Incineration)
	Waste Diversion/recycling	6. Diversion of solid waste from Landfil / Material Separation Facilities/at source
<b>3. Water</b>	Water resource development	7. Renewable Energy desalination plants (seawater, brackish water/other)
	Water infrastructure operations, maintenance and rehabilitation	8. Public Private Partnership (PPP) to rehabilitate, operate and maintain public water infrastructure
	Water Harvesting	9. Commercial/Industrial water harvesting
	Wastewater treatment and Wastewater to energy	10. Industrial water reuse, recycling and recovery
		11. Wastewater Biogas to electricity
<b>4. Agriculture, Food Systems and Food Security</b>	Climate Smart Agriculture (incorporating weather, water, seeds/varieties, nutrients/markets)	12. Conservation Agriculture (Climate Smart Agriculture)
		13. Controlled Environment Agriculture/Precision Agriculture (Greentech/ICT solutions) (Energy Efficiency/Renewables (Irrigation, Packhouses, cold stores/cellars) (Water Efficiency)
	Agri-Processing, productions and related foods systems	14. Agri-parks (agri-production and agri-processing) and Special Economic Zones (SEZ) for Greentech
<b>5. Low Carbon Climate Resilient Built Environment and Human Settlements</b>	Green buildings / Human settlements / Infrastructure	15. Green buildings for social, low-income housing (RE/EE, Water and Waste Management, sustainable building materials).

### Innovative climate finance mechanisms

A limited review of innovative climate finance mechanisms and trends indicates that there are potential opportunities for catalysing or scaling private sector finance, through the use of:

- **Blended Finance** – There is a potentially significant role for blended finance in crowding in private sector finance at scale, especially in respect of low-carbon infrastructure projects or nascent green-tech industries.
- **Green Bonds** - Green bonds offer a significant opportunity (especially at provincial and municipal level) to mobilise large amounts of private capital earmarked for low-carbon, climate resilient investments.
- **Performance-based grant funds** – Green outcomes-based funds could offer private sector institutional investors the opportunity to increase investment in green Small Medium and Micro-Enterprises (SMMs), by paying for pre-agreed green outcomes, such as (amongst others) green job creation, climate change mitigation and improved water and waste management, subject to matching private sector funding.

The following themes have emerged from a review of selected innovative climate finance mechanisms and /or concepts:

- Use of market aggregator mechanism to create scale, pool risk, reduce costs and improve project viability.
- Funding solutions that address the upfront infrastructure finance gap, by introducing credit-worthy third-party owners and or operators of infrastructure who, in turn, enter into long-term contracts with end-users and/or beneficiaries.
- Risk transfer / reduction through the use of guarantees or appropriate risk allocation between the parties, which improves the risk-return profile of the investment and encourages private sector to investment.
- Blending of finance using a phased approach that apply concessional finance to initial, more risky pilot projects, with scaled-up follow-on investments that target commercial co-finance from private sector, once the concept is proven.
- Use of technology to drive operational efficiencies and improve viability of investments.
- Introduction of financial and non-financial incentives (e.g. training, access to networks or experience) to stimulate investment into alternative low-carbon investment options.

### Recommendations

Options for targeting standalone climate projects that seek private sector participation through GCF or similar concessional finance

The following are some high-level options for targeting large standalone climate change projects involving the private sector:

- Establish a South African Lab, similar to the Brazil Lab or India Lab, which serves as a mechanism for identifying and incubating standalone high-impact, transformative projects.
- Request for proposals (RFP) by local Accredited Entities (AE) and the major local commercial banks in partnership with AE, with targeted funding windows, based on either (i) specific GCF results areas (ii) type of funding support required based on stage/maturity of project. These RFPs, would complement any RFP's issued by the GCF.
- Sustained capacity building with respect to project development, project finance and project implementation, especially at the sub-national level (municipalities and local project developers and local financial institutions), including support for an enabling environment through policy advocacy and technical assistance.
- Incentives for commercial banks to innovate and scale funding for specific sector-based green projects (e.g. Energy Efficiency, Climate Smart Agriculture, Green Buildings, Social Sustainable Housing), through co-finance and/or outcomes -based grants and highly concessional loans for a specified period to build the respective markets.

### Looking ahead

This report includes an initial exploration of:

- i. the priority sectors and related priority investment areas for mobilising and scaling private sector investment in support of South Africa's NDC; and
- ii. innovative climate finance mechanisms or trends relevant to South Africa climate response.

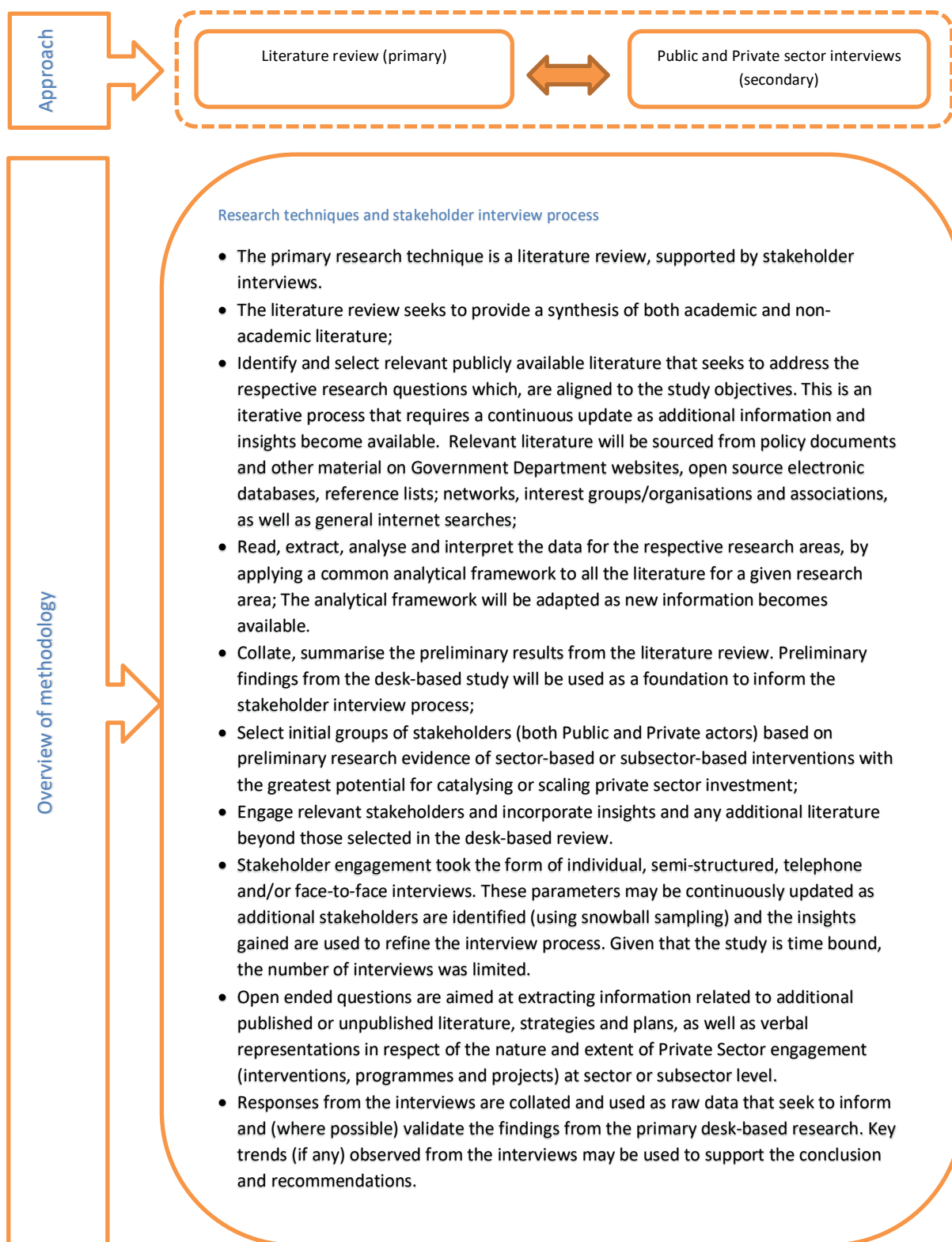
As such, the analysis provides a preliminary base for a comprehensive evaluation of each of the private sector opportunities and funding solutions. This will ultimately inform the prioritisation of short-listed projects for implementation and GCF funding support.

In order to build on the findings of this study, additional work is required in order to:

- Build a deeper understanding of the evolving business models and innovative financing mechanisms being explored and developed within the identified priority investment areas for the private sector. This may take the form of detailed case studies.
- Evaluate the effectiveness of existing partnerships and engagement between sector-based government departments and the private-sector developers and financiers, with a view to strengthening existing arrangement and/or establishing new commitments on the scaling of low carbon, climate resilient investments in the prioritised sectors.
- Evaluate the effectiveness of the GCF readiness preparatory support programmes in strengthening the National Designated Authority (NDA) and regional, national and local entities, to oversee and implement climate change projects and related climate finance in the prioritised investment areas.
- Evaluate the effectiveness of existing project preparation support programmes and address issues related to lack of capacity and skill development and transfer. One of the key issues is that the existing support programmes fail to address the long-term nature of skills development and skills transfer.
- Assess local options for simplifying and speeding-up access to GCF funding in the prioritised investment areas, specifically enhancing the role of the four major commercial banks in South Africa.

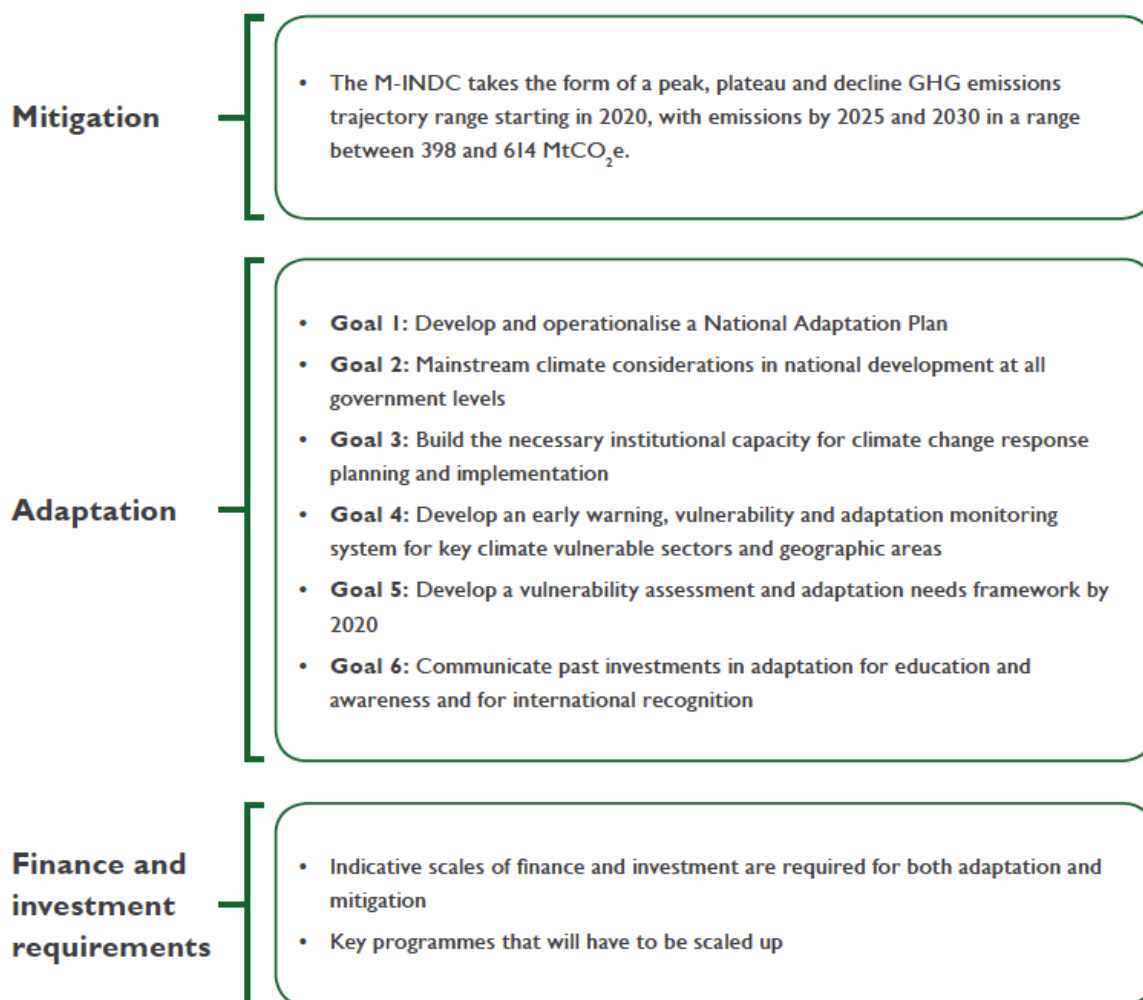


Below is an outline of the approach and methodology used for the study.



## Nationally Determined Contributions (NDC)

South Africa has committed itself to respond to climate change and its impacts, by ratifying the UNFCCC and the Kyoto Protocol. Towards the end of 2015 South Africa submitted its Intended Nationally Determined Contribution (INDC)<sup>61</sup> to the UNFCCC, which addresses mitigation and adaptation, as well as finance and investment requirements.<sup>62</sup>



In making these commitments, the Government of South Africa has noted in the INDC submission that "...as a result of the historical development pathway of its energy sector, South Africa is currently heavily dependent on coal, with a fleet of old and inefficient coal-fired power plants that are nearing, but not yet at, the end of their design life-cycles as well as being reliant on a significant proportion of its liquid fuels being generated from coal. Therefore, in the short-term (up to 2025), South Africa faces significant rigidity in its economy and any policy-driven transition to a low carbon and climate resilient society must take into account and emphasise its overriding priority to address poverty and inequality."

<sup>61</sup> Intended Nationally Determined Contributions (INDCs) become Nationally Determined Contributions (NDCs) once parties to the UNFCCC deposit an "instrument of ratification, acceptance or approval" of the Paris Agreement. South Africa has deposited such instrument of ratification.

<sup>62</sup> DEA, 2<sup>nd</sup> CCAR, 2016

## National Development Plan 2030

The NDP's over-arching aims are to eliminate poverty and reduce inequality by 2030. In summary, critical actions proposed by the NDP 2030, include:

1. A social compact to reduce poverty and inequality, and raise employment and investment.
2. A strategy to address poverty and its impacts by broadening access to employment, strengthening the social wage, improving public transport and raising rural incomes.
3. Professionalise the public service, strengthen accountability, improve coordination and prosecute corruption.
4. Boost private investment in labour-intensive areas, competitiveness and exports, with adjustments to lower the risk of hiring younger workers.
5. An education accountability chain, with lines of responsibility from state to classroom.
6. Phase in national health insurance, with a focus on upgrading public health facilities, producing more health professionals and reducing the relative cost of private health care.
7. Public infrastructure investment at 10 percent of gross domestic product (GDP), financed through tariffs, public-private partnerships, taxes and loans and focused on **transport, energy and water**.
8. **Interventions to ensure environmental sustainability and resilience to future shocks.**
9. New spatial norms and standards – densifying cities, improving transport, locating jobs where people live, upgrading informal settlements and fixing housing market gaps.
10. Reduce crime by strengthening criminal justice and improving community environments.

South Africa's 2030 vision for a transition to a low-carbon economy is focused around the following adaptation and mitigation priorities (BUR 1, 2014):

<b>Adaptation</b>	<ul style="list-style-type: none"> <li>• Adequate support for the vulnerable and equitable disbursement of financial assistance.</li> <li>• Significant investments in new adaptive technologies and techniques in the water, biodiversity, fisheries, forestry and agricultural sectors.</li> <li>• Early warning systems for adverse weather, pest and disease occurrence.</li> <li>• Disaster relief preparedness</li> <li>• Significant investment in conserving, rehabilitating and restoring natural ecosystems to improve resilience</li> </ul>
<b>Mitigation</b>	<ul style="list-style-type: none"> <li>• A commitment to undertake mitigation actions.</li> <li>• An appropriate mix of carbon pricing mechanisms.</li> <li>• An expanded renewable energy programme.</li> <li>• An advanced liquid and bio-fuels sector.</li> <li>• An effective mix of energy efficiency and demand management incentives.</li> <li>• Proactive local government climate change programmes in areas such as waste management and street lighting.</li> <li>• Regulation to promote green building and construction practices.</li> <li>• Investments in efficient public transport systems.</li> <li>• A robust and transparent monitoring, reporting and verification system.</li> </ul>

*NDP 2030 and the Medium-Term Strategic Framework*

The NDP 2030 envisages a phased trajectory for South Africa's transition to an environmentally sustainable, climate resilient, low-carbon economy. The phases cover the three successive Medium-Term Strategic Framework (MTSF) periods, 2014 – 2019, 2020 – 2024 and 2025 – 2029. The MTSF sets out the actions that Government has committed to and the targets to be achieved in terms of the NDP and its electoral mandate.

The MTSF (2014 – 2019) is structured around 14 priority outcomes which cover the focus areas identified in the NDP 2030. The MTSF (2014 to 2019), is the initial planning, piloting and investing phase and focuses on:

- Creating a framework for implementing the transition to an environmentally sustainable, low-carbon economy;
- Understanding and unblocking regulatory constraints;
- Data collection, establishment of baseline information and indicators, and
- Testing concepts and ideas to determine whether these are scalable.

MTSF (2019-2024) focuses on the implementation of sustainable development programmes and targeting a peaking of GHG emissions. The third phase (2024-2029) involves the advanced stage in the transition and the realisation of the NDP vision of reducing poverty and unemployment to socially sustainable levels and emissions reaching a plateau by 2030.

*NDP 2030 and United Nations Sustainable Development Goals*

On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development — adopted by world leaders in September 2015 at an historic UN Summit — officially came into force. The adoption of the SGD Agenda followed on from the successful international multilateral agreements at the Third International Conference for the Financing for Development, resulting in the Addis Ababa Action Agenda and the 21st Conference of the Parties of the United Nations Framework Convention for Climate Change (UNFCCC), (resulting in the Paris Agreement). The SDGs, also known as the Global Goals, build on the momentum of the Millennium Development Goals (MDGs) and aim to go further to end all forms of poverty.

South Africa played a key role in the negotiations and processes that led to the development of the 2030 Agenda for Sustainable Development, including its seventeen SDGs. Aspects of the negotiations were informed by the priorities of South Africa's National Development Plan (NDP)<sup>63</sup>.

According to a mapping exercise undertaken by National Business Initiative (NBI) in 2016, which compares the United Nations Sustainable Development Goals (SDG) targets and the chapter-based objectives of the NDP, there is significant overlap between the NDP and the SDG (over 90% of the NDP's 72 stated objectives can be mapped to the 169 SDG targets). "In summary, the NDP and SDGs have a similar purpose and timeline, and implementation of the NDP will provide an important means for South Africa to achieve and report on progress with respect to the SDGs."<sup>64</sup>

According to the South African SDG Hub, "South Africa possesses important assets in working towards realising the vision of both the NDP and the SDGs, including strong institutions, a wealth of local capabilities and a capable statistics system, but it also faces considerable challenges regarding implementation, capacity building, financing and engagement."

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<sup>63</sup> South African SDG Hub, Implementing the SDGs in South Africa: Challenges and Opportunities, 2018

<sup>64</sup> NBI, 2016

*The New Growth Path (NGP 2010)*

The NGP is a Department of Economic Development (DED) framework – reflecting the government’s plan of action. Its purpose is to implement a set of macroeconomic and microeconomic interventions with clear and concrete stakeholder commitments to move South Africa to faster, more inclusive and sustainable growth (DED, 2010). The NGP objectives are consistent with that of the NDP 2030, i.e. to build an inclusive economy and create decent employment, sustainable livelihoods and eradicate poverty and income inequality.

The NGP proposes employment creation through labour absorbing growth in targeted sectors, such as infrastructure, the agricultural value chain, the mining value chain, the green economy<sup>65</sup>, manufacturing sectors included in the IPAP2 and tourism (Sheryl Hendricks, AEASA 2012).

Nine-point plan

The former President Zuma, announced a nine-point economic intervention plan in his 2015 SONA, aimed at supporting the implementation of the MTSF and promoting economic growth and job creation. The nine-point plan is based on the following drivers and enablers:



Source: Adapted from “Revised Strategic Plan 2015 to 2020”.

<sup>65</sup> A green economy is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcity.” (UNEP, Green Economy Reports: A Preview, 2010, p. 4-5)

*Strategic Integrated Projects*

“The Government of South Africa has adopted an Infrastructure Plan that is intended to transform the economic landscape of South Africa, create significant numbers of new jobs, strengthen the delivery of basic services to the people of South Africa and support the integration of African economies.”<sup>66</sup>

The Cabinet established the Presidential Infrastructure Coordinating Commission (PICC), to integrate and coordinate the long-term infrastructure build. The PICC assessed South Africa’s infrastructure gaps, considering future population growth, projected economic growth and areas of the country which are not served with water, electricity, roads, sanitation and communication.

A number of Strategic Integrated Projects (SIPs) were developed to support economic development and address service delivery in the poorest provinces. The SIPs cover social and economic infrastructure across all nine provinces (with emphasis given to lagging regions).

There are 18 SIPs<sup>67</sup>, each of which comprises a large number of specific infrastructure components/programmes:

Strategic Integrated Project (SIP) - Department of Economic Development			
1	Unlocking the Northern Mineral Belt with Waterberg as the catalyst	10	Electricity Transmission and Distribution for all
2	Durban- Free State- Gauteng Logistics and Industrial Corridor	11	<b>Agri-Logistics and Rural Infrastructure</b>
3	South Eastern node & corridor development	12	Revitalisation of public hospitals and other health facilities
4	Unlocking the economic opportunities in North West Province	13	National school build programme
5	Saldanha-Northern Cape Development Corridor	14	Higher Education Infrastructure
6	Integrated Municipal Infrastructure Project	15	Expanding access to communication technology
7	<b>Integrated Urban Space and Public Transport Programme</b>	16	SKA & MeerKat
8	<b>Green Energy in support of the South African economy</b>	17	Regional Integration for African cooperation and development
9	Electricity Generation to support socio-economic development	18	<b>Water and Sanitation Infrastructure Master Plan</b>

SIP 19, Ecological Infrastructure for Water Security, was submitted to the PICC for approval in October 2014. The proposed SIP 19 provides a framework for the integration of a number of impactful water-related ecological infrastructure investments and interventions.

The SIPs highlighted in bold in the table above, as well as SIP 19, have particular relevance in light of the Near-Term Climate Change Flagship Programmes discussed later in this report.

<sup>66</sup> [https://www.environment.gov.za/sites/default/files/docs/sip19\\_ecologicalinfrastructure\\_watersecurity.pdf](https://www.environment.gov.za/sites/default/files/docs/sip19_ecologicalinfrastructure_watersecurity.pdf)

<sup>67</sup> <https://www.gov.za/issues/national-infrastructure-plan>

## National Climate Change Response Policy (NCCRP)

The NCCRP has two primary objectives:

1. Managing the impacts of climate change by building and sustaining South Africa's social, economic and environmental resilience; and
2. Contributing to the global effort to stabilise global emissions (GHG), while simultaneously enabling sustainable economic, social and environmental development

The overall approach of the National Climate Change response is:

- **'Needs driven and customized'** – wide range of interventions, but adapted to meet the needs of those that are most vulnerable;
- **'Developmental'** – environmental and socio-economic co-benefits;
- **'Transformational, empowering and participatory'** – address climate change at a 'scale of economy' and encourage broad participation and a shift in mindset to sustainable consumption and production;
- **'Dynamic and evidenced-based'** – leverage and/or scale-up existing programmes/interventions and continue further research and continuously learn and improve;
- **'Balanced and cost effective'** – in terms of cost-benefit, prioritisation, focus, action and resource allocation; and
- **'Integrated and aligned'** – integration and alignment of sector policies, measures and processes (et.al.) at national, provincial and local levels.

*Institutional arrangements*

Key domestic institutional arrangements related to the climate change response, include (amongst other):

Entity	Role
Ministerial Committee on Climate Change (IMCCC)	Oversees the implementation of all aspects of the national climate change response policy (Executive level coordination).
Intergovernmental Committee on Climate Change (IGCCC)	Fosters information exchange, consultation and support among the three spheres of government on climate change. The Climate Change Flagship Programmes Steering Committee (CCFPSC) is located under the IGCCC was set up to address the planning and coordination deficit in implementation of the Climate Change Flagship Programmes.
National Committee on Climate Change (NCCC)	Advises and consults DEA on matters relating to national responsibilities with respect to implementation of the NCCRP and climate change
DEA (National)	Coordinates policy formulation and Monitoring, Reporting and Validation (MRV)
Department of Energy (DoE)	Develops energy policies and regulates legislation on energy production and use
South African National Energy Development Institute (SANEDI)	Monitors, conducts research and promotes green economy and energy efficiency
Electricity Supply Commission (Eskom)	Primary electricity producer in South Africa/demand-side management
Coal-Tech and Sasol	Coal to Fuel energy development and research
South African Revenue Services (SARS)	Main authority for carbon tax collection
Provincial and local governments/municipalities	Responsible for integrating climate change into municipal development planning tools and municipal service delivery programmes (i.e. human settlements and urban development; the provision of municipal infrastructure and services; water and energy demand management; and local disaster response, amongst others).

The NCCRS's ten strategic priorities are outlined below (Source: BUR 1, 2014):

Priorities	Description
Risk reduction and management	Near-term adaptation interventions that address immediate and observed threats to the economy, ecosystem services and the health and well-being of people. Research and develop short-, medium- and longer-term climate resilience, risk and vulnerability management policies and measures.
Mitigation actions with significant outcomes	Cost effective and beneficial mitigation policies to decline GHG emission trajectory where GHG emissions peak between 2020 and 2025, plateau for approximately a decade and begin declining in absolute terms thereafter.
Sectoral responses	Prioritise, in accordance with the provisions of this policy, the requirement for all key actors, organisations or participants in relevant sectors or sub-sectors to prepare, submit implement, monitor and report the implementation of detailed climate change response strategies and action plans that clearly articulate their roles, responsibilities, policies, measures, and interventions or actions to contribute to the achievement of the National Climate Change Response Objective in a measurable way
Policy and regulatory alignment	Prioritise interventions already envisaged by national policies, legislation or strategies that have climate change co-benefits, particularly those that also contribute towards the national priorities of job creation, poverty alleviation or have other positive socioeconomic benefits. Review existing national policies, legislation or strategies, with a view to optimising and maximising the climate change co-benefits of their interventions. Integrate into the relevant existing or new policies, legislation or strategies those climate change response interventions that stimulate new economic activities as well as those that improve the efficiency and competitive advantage of existing activities.
Integrated planning	Mainstreaming of climate change considerations and responses into all relevant sectors, national, provincial and local planning regimes.
Informed decision-making and planning	Prioritise research, systemic observation, knowledge generation, information management and early warning systems that increase our ability to measure and predict climate change and the implications of its adverse effects on the economy, society and the environment.
Technology research, development and innovation	Prioritise cooperation and the promotion of research, investment in and/or acquisition of adaptation, lower-carbon and energy-efficient technologies, practices and processes for employment by existing or new sectors or sub-sectors.
Facilitated behaviour change	Use of incentives and disincentives, including regulatory, economic and fiscal measures, to promote behaviour change towards a lower-carbon society and economy.
Behaviour change through choice	Prioritise education, training and public awareness programmes to build the general public awareness of climate change so as to empower all South Africans to make informed choices that contribute to an economy and society that is resilient to climate change.
Resource mobilisation	Prioritise the development of comprehensive resource and investment mobilization strategies, capacities, mechanisms or instruments that support and enable implementation of climate change responses at the scale required.

According to the National Climate Change Response Policy (NCCRP), The National Department of Environmental Affairs (DEA) is the mandated authority for the implementation of the NCCRP. The provincial departments are the mandated authority for the maintenance and preservation of the environment within their boundaries, and are responsible for the development of their climate change response strategies, evaluation of provincial climate risks and impacts and identification of key adaptation measures.



National Strategy for Sustainable Development and Action Plan (NSSD1, 2011 – 2014)

Consistent with the NCCRP, the NSDD1 identifies 5 strategic priorities, as follows:

- Enhancing systems for integrated planning and implementation;
- Sustaining our ecosystems and using natural resources efficiently;
- Towards a green economy (economic development through investing in infrastructure in a sustainable manner);
- Building sustainable communities; and
- Responding effectively to climate change.

#### Draft Climate Change Bill

The Minister of Environmental Affairs, Dr Edna Molewa, has published the National Climate Change Bill in Government Gazette for public comment on 10 June 2018.

The proposed legislation, provides for (amongst others):

- **National Framework**
  - the establishment of a national environmentally sustainable development framework for achieving the objects of this Act within two years;
- **Alignment of laws and policies**
  - coordination and harmonisation of Climate Change policies, plans, programmes and decisions of the national, provincial and local spheres of government;
- **Institutional arrangements and coordination**
  - establishment of a Ministerial Committee on Climate Change (MCCC) that must coordinate efforts across all sector departments and spheres of government towards a transition to a climate resilient and lower carbon economy and society in accordance with NCCRWP and NDC.
  - The establishment of a Provincial Committee on Climate Change (PCCC) to coordinate climate actions at the provincial level, in liaison with MCCC.
  - Provincial Climate Change needs and response assessments to be undertaken within one year of operation of the Act and the development and implementation of provincial implementation plans covering all priority sectors within two years.
- **Adaptation plan and Adaptation Scenarios**
  - Development of a National Adaptation Strategy, as well as short, medium and long-term adaptation scenarios in consultation with sector departments and provinces.
- **GHG Emissions and removals –**
  - determination of a national GHG emissions trajectory,
  - prescription of sectoral emissions targets,
  - determination of a GHG emissions threshold to inform the allocation of carbon budgets and
  - development of plans for the phasing down or phasing out of synthetic GHG emissions and declaration of certain gas emissions as synthetic GHGs.

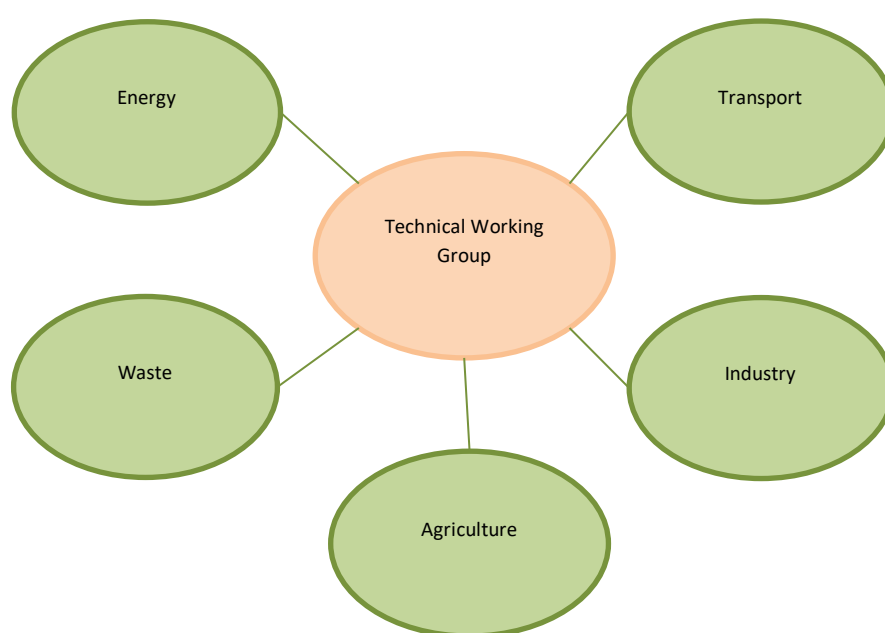
Mitigation

Governments Strategic GHG emissions reduction programmes or activities are shown in the table below:

Sector	Strategic Mitigation Programme	Description
Energy	National Energy Efficiency Strategy	Quantifiable targets for the major demand sectors, as well supply sector
	Integrated Resource Plan	Preferred generation technologies – Renewable Independent Power Producers Procurement Programme (REIPPPP)
	South African Centre for Carbon Capture and Storage	Innovative clean technological applications that address climate change
Industry	The DTI Incentives Schemes	Drive growth, foreign direct investment and promote competitiveness in the manufacturing sector in line with Industrial Policy Action Plan (IPAP) and National Industrial Policy Framework (NIPF)
	Sections 12B, 12I, 12L, 12K and 37B of the Income Tax Act	Provision of financial incentives to promote the use of lower-carbon technologies
Transport	Public Transport Strategy	National Transport Master Plan (NATMAP); Focusses on Accelerated Modal Upgrading and Integrated Rapid Public Transport Networks
	Biofuels Industrial Strategy	Aims to create a market for biologically produced fuels for use as blending components in the production of petrol or diesel.

For a more detailed list of programmes or projects, refer to Annexure D.

The existing operational structure used for mitigation actions (DEA, 2013):



Technical Working Group (TWG) composition:

- Government:- DEA, dti, DoE, DAFF, National Treasury, DST, DoT, DMR, EDD, DPE;
- Civil Society;
- Labour;
- Business; and
- State-owned research institutions.

#### GHG Inventory System

The National GHG Emission Reporting Regulations that took effect on 3 April 2017. The regulations provide for (amongst other) a single national reporting system for the transparent reporting, updating and maintaining of GHG emissions.

South Africa is implementing a series of sector-specific projects aimed at improving the current National GHG Information System (NGHGIS). The NGHGIS seeks to improve the data management, documentation, governance and institutionalisation of the GHG preparation process. More than 15 partners are included in this programme implemented from 2016 –2018.<sup>68</sup>

#### Market-based instruments

The South African government's 2006 draft Environmental Fiscal Reform Policy Paper recognised the role for environmentally-related taxes to complement existing regulatory policy interventions and address environmental challenges such as climate change. A number of climate change-related financial instruments have since been introduced in South Africa, including the electricity generation levy, motor vehicle emissions tax, the levy on incandescent light bulbs; and a range of tax incentive measures to support:

- renewable energy investments (depreciation allowances for renewable electricity generation and biofuels)
- investments in projects under the Clean Development Mechanism (CDM) (i.e. income tax exemption for revenues from the sale of certified emission reduction units resulting from CDM projects);
- biodiversity conservation and management; and
- the proposed energy efficiency savings tax allowances (e.g. 12i and 12L tax incentives).
  - The 12i tax incentive, managed by the Department of Trade and Industry (dti), offers indirect financial support for energy efficiency greenfield investment and plant expansion in commercial enterprises. The scheme targets investment projects in relevant manufacturing sectors, such as agro-processing, chemicals, plastics, non-metallic and mineral products, metal products, construction and recycling industries. Brownfield projects must inter alia realise a 10% energy efficiency improvement, in order to access the scheme, while greenfield projects must utilise "modern, viable energy-efficient equipment & processes"<sup>69</sup>.
  - The 12L tax incentive for energy savings has been implemented by the DoE since December 2013. Businesses may claim a deduction against taxable income equivalent to the monetary value of proven energy efficiency savings. The scheme was enhanced in 2015 with an increase in the deduction from ZAR 0.45 to 0.95 (USD 0.04 to 0.07) for every kWh saved<sup>70</sup>.

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<sup>68</sup> DEA, 2<sup>nd</sup> CCAR, 2016

<sup>69</sup> dti, 2015

<sup>70</sup> SANEDI, 2016

The National Treasury's carbon tax discussion paper<sup>71</sup> was published for public comments as far back as December 2010. This paper motivated the role for carbon taxes as a policy measure to stimulate behaviour changes among producers and consumers in favour of less energy intensive, lower-carbon alternatives.

### Carbon Tax

The proposed carbon tax is intended to account for the social costs resulting from carbon emissions. It is a useful tool aimed at sending the necessary price signals to the market in order to change producer, consumer and investor behaviours; and to stimulate a shift towards low carbon development. The proposed carbon tax includes "revenue recycling" measures, which are intended to minimise/counter any potential negative effects of the carbon tax on economic growth.

The proposed tax will be introduced in a phased-approach to allow for a smooth transition in adopting cleaner and more efficient technologies and behaviours. The draft carbon tax bill was released in December 2017 for comment, and is expected to be tabled in Parliament by mid 2018 with the implementation date expected to be announced during the 2019 National Budget.

Proposed Carbon Tax design<sup>72</sup> features:

Component	Description
Revenue	<ul style="list-style-type: none"> <li>Carbon tax at an initial R120 per ton of CO<sub>2</sub>;</li> <li>60% basic tax-free threshold and maximum of 10% tax-free allowance for trade exposure;</li> <li>10% tax-free allowance for process and fugitive emissions;</li> <li>Up to 5% performance allowance;</li> <li>5% tax-free allowance for complying with carbon budgets information requirements;</li> <li>5-10% (based on sector) allowance for carbon offsets – to reduce the carbon tax liability.</li> <li>tax base comprises emissions from fossil fuel combustion, industrial process and product use and fugitive emissions.</li> </ul>
Tax free allowances	<ul style="list-style-type: none"> <li>Tax-free allowances of 60-95%;</li> <li>Effective tax-rate of R6 –R48 t/CO<sub>2</sub>e;</li> <li>No impact on electricity prices in the first phase</li> </ul>
Revenue recycling	<ul style="list-style-type: none"> <li>Energy efficiency savings tax incentive;</li> <li>Credit against Eskom's carbon tax liability for the renewable energy premium in electricity tariffs;</li> <li>Credit for the electricity levy;</li> <li>Support for the installation of solar water geysers;</li> <li>Enhanced free basic electricity / energy for low income households; and</li> <li>Improved public passenger transport and support for shift of freight from road to rail.</li> </ul>

<sup>71</sup> Reducing GHG Emissions: The Carbon Tax Option, 2010

<sup>72</sup> PMG 2018, Carbon Tax Draft Bill: National Treasury briefing (<https://pmg.org.za/committee-meeting/25778/>)

*Company - level carbon budgets*

Companies (mainly those in targeted production industries<sup>73</sup>), who emit more than 0.1 Mt of GHGs annually, will be allocated a carbon budget. During Phase 1, (2016 – 2020) companies will not be legally required to limit their emissions to their carbon budgets, but will have to comply with:

- the process of allocating carbon budgets;
- reporting on their emissions and on progress with achieving their budgets;
- the submission of a final report after the conclusion of the first phase; and
- any other supplementary information.

*The private sector voluntary Carbon Disclosure Project*

The Carbon Disclosure Project (CDP) is a not-for-profit organisation that administers the global disclosure system for investors, companies, cities, states and regions to manage their environmental impacts. The CDP has mainstreamed climate change into business thinking since its inception and remains the global standard for measurement and reporting of climate change information and the biggest repository of GHG emission information from the business sector.<sup>74</sup> The CDP also helps companies better understand the climate risks within their portfolios by integrating climate change into their overall strategy and governance structures. Companies are thus able to shift the focus on performance in terms of their climate change actions.

The National Business Initiative<sup>75</sup> (NBI) has been a local partner to the CDP since 2007. Information on climate change risks, opportunities and integration are requested from JSE 100 companies. A decade of CDP data has shown that South African companies responding to CDP, have led their global peers on a number of metrics, however, there may be signs that this momentum is slowing. On the positive side, 57% more companies have set renewable energy targets and 56% of reporting companies have placed an internal price on carbon (2017). While investment remains focussed on energy efficiency, South African companies invested R3.35 billion in emissions reduction activities saving R1.4 billion.<sup>76</sup>

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<sup>73</sup> Coal, crude oil, natural gas; liquid fuels from coal or gas, cement, glass, ammonia, nitric acid, carbon black, iron and steel, ferro-alloys, aluminium, polymers, pulp and paper, as well as industries or companies producing similar primary products.

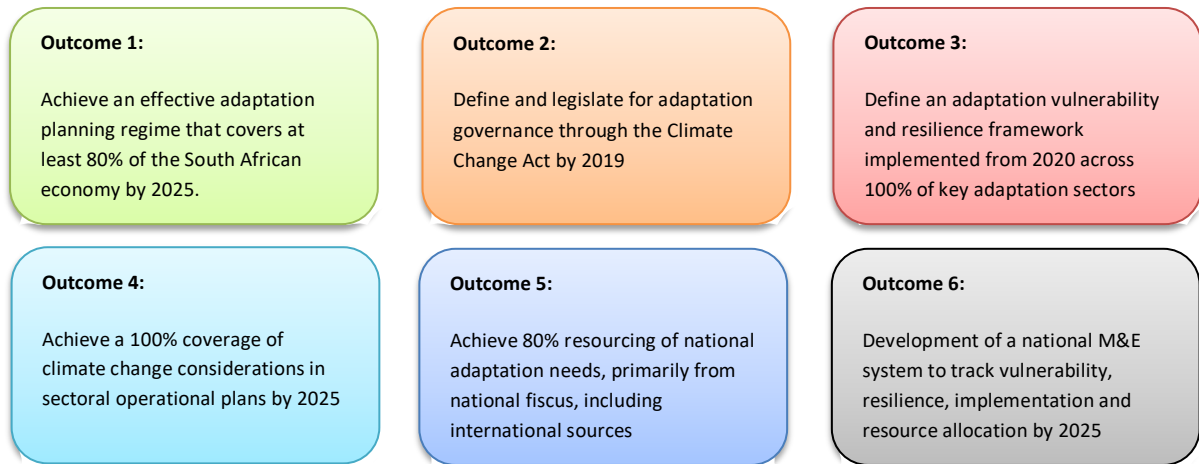
<sup>74</sup> DEA, 2<sup>nd</sup> CCAR, 2016

<sup>75</sup> <http://www.nbi.org.za/>

<sup>76</sup> NBI, CDP South Africa Climate Change, 2017

## Adaptation

The draft National Adaptation Strategy (NAS) was published in October 2017 for public comments and sets out the following 6 strategic outcomes and expected broad timelines.



The DEA is cited in the draft NAS as the institution responsible for coordination activities in terms of research, establishment of institutional arrangements and implementation for those sectors under its mandate. National departments (such as National Treasury and sector departments), as well as local government structures are responsible for providing and mobilising the adaptation funding for the implementation of the NAS priorities.

*Long Term Adaptation Scenarios (LTAS)*

The LTAS Phase 1 (2012 – 2014) was a multi-sectoral research programme aimed at providing a consensus view of climate change trends and projections for South Africa. The programme is mandated by the NCCRWP and aims to develop national and sub-national adaptation scenarios for South Africa under plausible future climate conditions and development pathways. LTAS Phase 1 focused on primary sectors namely **water, agriculture and forestry, human health, marine fisheries, and biodiversity**.

The DEA is currently obtaining comments on the LTAS Phase 2 reports, which cover perspectives on:

- The Southern African Development Community (SADC);
- Disaster Risk Reduction and Management in South Africa;
- Climate Information and Early Warning Systems to Support Disaster Risk Reduction and Management under future climate conditions in South Africa;
- Urban, Rural and Coastal Human Settlements in South Africa;
- Climate Change Adaptation: Perspectives on Food Security in South Africa;
- The Economics of Adaptation to Future Climates in South Africa; and
- Long Term Adaptation Scenarios for South Africa.

*The National Framework for Climate Services South Africa (NFCS-SA)*

The NFCS-SA is an initiative led by the DEA and South African Weather Service (SAWS) which is currently under development. The NFCS-SA is intended to “mainstream climate science into decision-making at all levels and help ensure that every climate-sensitive sector of society is well equipped to access and apply the relevant climate information”.<sup>77</sup>

The overall aim of the National Framework for Climate Services is to strengthen the availability and use of science-based climate prediction and services in South Africa. The NFCS-SA priority sectors include human settlements, health, water, disaster management and reduction, agriculture and food security, biodiversity, energy and oceans and coasts.

A web-based Climate Services Portal and a National Climate Centre (with the Centre either being established as a programme, legislated entity or unit within an existing entity) are envisaged under the National Framework, to assist in the delivery and use of science-based climate services by a range of stakeholders, including the private sector.<sup>78</sup>

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<sup>77</sup> (DEA, undated)

<sup>78</sup> DEA, 2017

*Outcome 10: protect and enhance our environmental assets and natural resources*

The NDP’s approach to environmental sustainability focuses on addressing the following key constraints:

- **Inadequately informed decision-making and governance:** - harness research and information management capacity to identify, develop and maintain datasets to generate policy-relevant statistics, indicators and indices;
- **Natural resource degradation and depletion of ecological infrastructure:** - implement an integrated environmental management framework and seek innovative approaches to natural resource management that entail a careful balance between development imperatives and sustainable utilization. Increase the amount of land and oceans under protection and build stocks of threatened fish species and reduce illegal catches;
- **Waste (e.g. hazardous waste, healthcare waste, mine dumps, leachate/sludge & general/solid waste management):** implement a waste hierarchy strategy of reduce, re-use and recycle, which requires rapid expansion of recycling infrastructure and product stewardship by producers;
- **Air pollution:** implement the Air Quality Act and develop and use innovative approaches, such as air quality offsetting;
- **Water pollution:** Invest in ecological infrastructure (such as healthy catchments, rivers and wetlands) in order to support water security and preserve ecosystems.; and
- **Adapting to Climate Change:** Employ market-based instruments such as a carbon tax, carbon budgets and policy support for low-carbon technologies to ensure that GHG emissions follow a peak (2025), plateau (2030) and decline (2035) trajectory.

The NDP’s sub-outcomes and actions for achieving environmental sustainability, include:

**Sub-outcome 1: Ecosystems are sustained and natural resource are used efficiently**

Action	Responsible Ministry/Entity
Implement strategies for water conservation and demand management	Water and Sanitation
Water resources protection	Water and Sanitation
Identify and develop management interventions for reducing species loss	Environmental Affairs (Provincial departments)
Integration of ecological infrastructure considerations into land-use planning and decision-making about new developments	Environmental Affairs (Provincial departments) Rural Development and Land Reform
Implement environmental regulations to mitigate negative environmental impacts in exploitation of mineral resources	Environmental Affairs Water and Sanitation Mineral Resources
Integrated environmental assessments for major infrastructure and provision of incentives for green economic activities	Environmental Affairs
Reduce Land Degradation	Agriculture, Forestry and Fisheries Environmental Affairs (“Working for...” Programmes)
Monitoring of the Oceans and Coast environmental integrity	Agriculture, Forestry and Fisheries Water and Sanitation Environmental Affairs
Implementation of Operation Phakisa Aquaculture initiatives	Agriculture, Forestry and Fisheries
Effective knowledge and information management for the sector	Environmental Affairs
Coherent and aligned multi-sector regulatory system & decision support across government	Environmental Affairs



**Sub-outcome 2 - An effective climate change mitigation and adaptation response**

Action	Responsible Ministry/Entity
Strategic Policy/ Regulatory frameworks and programmes to promote a low carbon economy	Transport Energy National Treasury
Development and Implementation of sector adaptation strategies/plans	Agriculture, Forestry and Fisheries Water and Sanitation Human Settlements Provincial departments and local authorities
Include climate change risks in the disaster management plans	Cooperative Governance
Research in Climate Services	Science and Technology Environmental Affairs (supported by Weather Services)
Monitor, report and verify GHG emissions	Environmental Affairs

**Sub-outcome 3 - An environmentally sustainable, low-carbon economy resulting from a well-managed just transition**

Action	Responsible Ministry/Entity
Promote a just transition to an environmentally sustainable economy	Environmental Affairs
Progressively develop, compile, transparently and accessibly report on a set of sustainable development indicators and underlying natural resource and pollution / emission indicators	Environmental Affairs
Enhanced environmental education; empowerment and job creation (including skills development)	Environmental Affairs (Provincial departments)
Implementation of the Environment Sector Skills Plan to address capacity requirements (gaps)	Environmental Affairs (Provincial departments) SANBI
Increase investment in research, development and innovation to support the transition to a green economy	Science and Technology

**Sub-outcome 4 - Enhanced governance systems and capacity**

Action	Responsible Ministry/Entity
Enhance compliance monitoring and enforcement capacity within the sector	Environmental Affairs (Provincial departments)
Enhance global cooperation	Environmental Affairs supported by International Relations and Cooperation
Improvement in air quality	Environmental Affairs (Provincial departments) District Municipalities
Less water that is better managed	Environmental Affairs (Provincial departments) Municipalities
Impacts of chemicals that are better managed	Environmental Affairs Sector stakeholders

**Sub-outcome 5 - Sustainable human communities**

Action	Responsible Ministry/Entity
Expand use of renewable energy through off-grid electrification	Energy
Local Government Support and Engagement	Environmental Affairs (Provincial departments)

The data was extracted from 2<sup>nd</sup> BUR, 2016 and 2<sup>nd</sup> CCAR, 2016, which uses slightly different sector categorisations. The author applied the format used in the 2<sup>nd</sup> CCAR, 2016 and merged selected data from the two reports. While every effort was made to ensure a correct match of the underlying programmes or interventions, there were certain programmes per the 2<sup>nd</sup> BUR, 2016 that did not fit the format of the 2<sup>nd</sup> CCAR, 2016.

Sector / sub-sector /Thematic Areas		Response measure	Climate Change Flagship programmes	Policy/Instrument/Strategy/ Action	Description	Status	Co-benefits
Energy	Energy Efficiency	Industrial Policy Action Plan (IPAP) – National Cleaner Production Centre (NCPC)	Energy Efficiency (EE) and Energy Demand Management Flagship Programme	Energy Efficiency strategy: National Cleaner Production Centre (NCPC)	The NCPC develops programmes that reduce pollution and improve resource efficiency in the private sector.	Current	<ul style="list-style-type: none"> <li>• Reduce energy consumption;</li> <li>• Reduce air pollution;</li> <li>• Reduce electricity bills;</li> <li>• Transfer and development of skills and expertise; and</li> <li>• Job creation.</li> </ul>
		Eskom – Integrated Demand Management (IDM) Programme	EE and Energy Demand Management Flagship Programme	Energy Efficiency Strategy: Energy Efficiency and Demand Side Management (EEDSM)	Eskom IDM aims at promoting energy efficient electricity use by supporting behavioural change and the switch to energy efficient technologies, systems and processes.	Current	<ul style="list-style-type: none"> <li>• Reduce energy consumption</li> <li>• Reduce air pollution</li> <li>• Reduce electricity bills</li> <li>• Transfer and development of skills and expertise</li> <li>• Job creation.</li> </ul>
		Section12L – Income Tax Act	EE and Energy Demand Management Flagship Programme	EE tax incentive	To promote energy efficiency as a means to safeguard security and supply of energy.		<ul style="list-style-type: none"> <li>• Promotes reduction of greenhouse gas emissions;</li> <li>• Promotes energy efficiency</li> </ul>
		Sasol Energy Efficiency projects	No	Gas engines, heat recovery and new design	<p>Since 2009, Sasol has implemented a range of electricity saving projects:</p> <ul style="list-style-type: none"> <li>• Wet sulphuric acid plant to produce 43 bar of steam, producing 9.1MW energy.</li> <li>• Open cycle gas turbine to produce 200MW of electricity.</li> <li>• Recovery of 290 tonnes of heat per hour from exhaust gas from an open cycle turbine, producing 68MW energy.</li> <li>• Gas power plant to provide 140MW of electricity.</li> </ul>	Completed	<ul style="list-style-type: none"> <li>• Energy security;</li> <li>• Reduce air pollution; and</li> <li>• Transfer and development of skills and expertise</li> <li>• Job creation.</li> </ul>

Sector / sub-sector /Thematic Areas		Response measure	Climate Change Flagship programmes	Policy/Instrument/Strategy/ Action	Description	Status	Co-benefits
Energy	Energy Efficiency	Municipal EE Programme	EE and Energy Demand Management Flagship Programme	Municipal Energy Efficiency and Demand Side Management, 2004-2014	The Energy Efficiency and Demand-side Management program is aimed at promoting the implementation of more energy-efficient technologies, processes and behaviours for municipalities. Disburse grant funding to municipalities to implement energy efficient retrofits within the municipal infrastructure.	Current	<ul style="list-style-type: none"> <li>• Reduce energy consumption</li> <li>• Reduce air pollution</li> <li>• Reduce electricity bills</li> <li>• Transfer and development of skills and expertise</li> <li>• Job creation.</li> </ul>
		DEA Green building	Low Carbon, Climate Resilient Built Environment, Communities and Human Settlements Flagship Programme	n/a	The DEA Green Building PPP project is designed to maximise and demonstrate energy efficiency and to meet green specifications. The building has received a "6" Green Star SA rating from the Green Building Council of South Africa (GBCSA), the highest for a public or private entity.	Completed	<ul style="list-style-type: none"> <li>• Reduce energy consumption</li> <li>• Reduce air pollution</li> <li>• Reduce electricity bills</li> <li>• Transfer and development of skills and expertise</li> <li>• Job creation</li> </ul>
		Energy Efficiency Target Monitoring System (EETMS) – EE Achieved nationally	EE and Energy Demand Management Flagship Programme	National Energy Efficiency Strategy (NEES)	The NEES is intended to support exploration of the potential for improved energy utilisation through reducing the country's energy intensity (thus reducing greenhouse gas emissions). The DoE has established an Energy Efficiency Target Monitoring System (EETMS), in order to progress with the targets set out in the strategy.	Current	<ul style="list-style-type: none"> <li>• Improving global competitiveness which will, in turn, contribute to job creation</li> </ul>
		Other EE measures	EE and Energy Demand Management Flagship Programme	<ul style="list-style-type: none"> <li>• Market Transformation Through the Introduction of Energy Efficiency Standards and the Labelling of Appliances</li> <li>• Private Sector Energy Efficiency Project</li> <li>• Energy Efficiency in the petroleum refining, oil and natural gas sectors</li> </ul>	<ul style="list-style-type: none"> <li>• This project aims to reduce the electricity demand of household appliances by developing and implementing S&amp;L programs for 12 appliances, with an ancillary reduction in greenhouse gas (GHG) emissions.</li> <li>• The NBI is implementing a Private Sector Energy Efficiency Project (PSEE) which aims to improve energy efficiency in commercial and industrial companies in South Africa</li> <li>• Mitigation of GHG emissions in the petroleum refineries, through efficiencies in boilers, heaters, waste/heat recovery and process control.</li> </ul>	Current	<ul style="list-style-type: none"> <li>• Reduce energy consumption</li> <li>• Reduce electricity bills</li> <li>• Indirect GHG emissions reductions</li> <li>• Energy savings</li> <li>• Energy intensity reduction</li> <li>• Job creation</li> <li>• Increased awareness of energy efficiency</li> </ul>
						Current	<ul style="list-style-type: none"> <li>• Improved onsite energy generation</li> <li>• Improved energy efficiency and security</li> </ul>

Sector / sub-sector /Thematic Areas		Response measure	Climate Change Flagship programmes	Policy/Instrument/Strategy/ Action	Description	Status	Co-benefits	
Energy	Generation	Diversification of electricity generation sources	Renewable Energy Flagship Programme	<ul style="list-style-type: none"> <li>White paper on Energy (1998) and White Paper on RE Policy (2003)</li> <li>Renewable Energy Independent Power Producer Procurement (REIPPP) Programme</li> <li>South African Wind Energy Programme</li> <li>The South African Coal Roadmap</li> <li>South African Post Office and Transnet Fuel Cell Programmes, 2015</li> </ul>	<ul style="list-style-type: none"> <li>The policy provides a range of measures to bring about integration of renewable energies into the mainstream energy economy.</li> <li>The Biofuels strategy is to create a market for biologically produced fuels, so that they can be used as a blending component in petrol/diesel production.</li> <li>The REIPPP programme's primary mandate is to secure electrical energy from the private sector for renewable and non-renewable energy sources.</li> <li>The South African Coal Roadmap was developed to explore the short, medium and long-term activities and interventions needed to support the coal industry in South Africa.</li> </ul>	Current, except for Biofuels (planned)	<p>Policy/strategy:</p> <ul style="list-style-type: none"> <li>Energy security and diversify the energy mix.</li> </ul> <p>REIPPP:</p> <ul style="list-style-type: none"> <li>Stimulate additional income that will flow to low-income households by as much as R128 million;</li> <li>Create 20 000 new jobs</li> </ul> <p>Wind:</p> <ul style="list-style-type: none"> <li>Develop capacity building and strengthened institutions</li> <li>Initiate green power funding</li> <li>Contribute to water</li> </ul> <p>Coal:</p> <ul style="list-style-type: none"> <li>Socio-economic and environmentally sustainable growth</li> </ul>	
		National Solar Water Heating Programme, 2008	No	NDP and subsidies	Subsidies for the installation of solar water heaters in low-cost housing developments. The National Development Plan mandates that 5 million solar water heating units are to be installed by 2019.	Current	Socio-economic and environmentally sustainable growth.	
		Alternative energy	Climate Change Response Public Works	Working for Energy Programme	Working for Energy Programme	Working for Energy is one of the initiatives of the DoE aimed at the provision of alternate forms of energy to cater for the needs of poor communities. The programme has constructed 26 biogas digesters at rural farms in the Ndwedwe municipality. The biogas digesters are used to generate power of 1500 watts for cooking stoves.	Current	<ul style="list-style-type: none"> <li>Contribute to reduce GHG emissions;</li> <li>Reduce air pollution;</li> <li>Reduction in environmental impact of using local wood resources.</li> <li>Transfer and development of skills and expertise; and</li> <li>Job creation.</li> </ul>
			Waste Management	Bio2watt Project	<p>The Green Fund:</p> <ul style="list-style-type: none"> <li>Organic Waste Treatment to Energy Project</li> <li>Beema Project</li> <li>Bio-Waste Treatment and Combined Heat and Power Facility</li> </ul>	<ul style="list-style-type: none"> <li>The Bio-Waste project aim to establish a bio digester that uses cow dung, blood and other organic waste as feedstock to produce methane and organic fertilizer.</li> <li>The Beema project involves the propagation of the bamboo shoots, and the use of bamboo as a feedstock to generate electricity using gasification technology.</li> <li>The organic waste project will involve investigating the feasibility of a dry anaerobic digestion (AD) facility involving the separation of solid waste at landfill site and the use of organic waste to generate energy.</li> <li>The Bio2Watt project uses cattle and poultry manure to generate electricity</li> </ul>	Current	<ul style="list-style-type: none"> <li>Conserve space in existing landfills</li> <li>Reduce GHG emissions and waste production</li> <li>Job creation</li> <li>Reduce water pollution</li> </ul>

Sector / sub-sector /Thematic Areas		Response measure	Climate Change Flagship programmes	Policy/Instrument/Strategy/ Action	Description	Status	Co-benefits			
Transport	Integrated and efficient public transport	Rea Vaya and My City bus rapid transport (BRT) system	Transport Flagship Programme	<ul style="list-style-type: none"> <li>Public Transport strategy, Integrated Public Transport Network (IPTN)</li> <li>Research and pilots in green transport</li> </ul>	<ul style="list-style-type: none"> <li>This programme covers the integration of urban public transport, including: Bus Rapid Transport, Metro Buses and Minibus Taxis. The programme includes dedicated lanes for public transport, an inner-city distribution system, integrated ticketing, and pedestrian and bicycle facilities.</li> <li>The aim of the BRT is to quickly and safely transport people to all parts of the city, and to link different parts of the city in a network.</li> <li>Review best practice in green transport, evaluate lifecycle costs and emissions profile of various green transport technologies and develop business plan to accelerate adoption of green transport in cities</li> </ul>	Current	<ul style="list-style-type: none"> <li>Reduces highway congestion;</li> <li>Saves commuter time; and</li> <li>Creates service, assembly and infrastructure jobs.</li> <li>Promote development of green transport</li> <li>Initiate funding for clean transport</li> <li>Job creation</li> <li>Capacity building</li> </ul>			
		South African Cities Network Green Transport Programme								
		Gautrain high-speed rail and luxury commuter rail						Transport Flagship Programme	Passenger rail	Modal shift from private vehicles to rail
	Green vehicles	Taxi Recapitalisation	Transport Flagship Programme	Integrated Public Transport Network	<p>This programme covers the integration of urban public transport, including: Bus Rapid Transport, Metro Buses and Minibus Taxis. The programme includes dedicated lanes for public transport, an inner-city distribution system, integrated ticketing, and pedestrian and bicycle facilities.</p>	Current	<ul style="list-style-type: none"> <li>Reduces highway congestion;</li> <li>Saves commuter time; and</li> <li>Creates service, assembly and infrastructure jobs.</li> </ul>			
		DEA Green Vehicles	Transport Flagship Programme	Introduction of green cars to the DEAs' vehicle fleet				<p>The initiative involves the introduction of electric vehicles to the DEA's vehicle fleet. The objective of the programme is for DEA to demonstrate the usefulness of eco-friendly fuel and or zero emission electrical vehicles. The pilot initiative ties in with the promotion of the use of renewable / clean energy for the country.</p>	Current	<ul style="list-style-type: none"> <li>Reduce air pollution;</li> <li>Transfer and development of skills and expertise.</li> </ul>
		Compressed natural gas (CNG) vehicle fuel switch	Transport Flagship Programme					Promoting the use of natural gas as an alternative fuel for vehicles and minibus taxis.	Current	<ul style="list-style-type: none"> <li>Reduce air pollution</li> <li>Job creation</li> </ul>
	Other transport programmes	Transnet Road-to-rail	Transport Flagship Programme			Shifting Road freight to rail	Current	<ul style="list-style-type: none"> <li>Reduces highway congestion</li> <li>Saves commuter time</li> <li>Creates service, assembly and infrastructure jobs</li> </ul>		
		Biofuels (biodiesel and bioethanol) and Clean Fuels	Transport Flagship Programme	<ul style="list-style-type: none"> <li>National Industrial Biofuels Strategy</li> <li>Clean Fuels 2 specification</li> </ul>		<ul style="list-style-type: none"> <li>The aim of this strategy is to create a market for biologically produced fuels, so that they can be used as a blending component in petrol/diesel production. The Biofuels Industrial Strategy has adopted a short-term focus and aims to achieve 2% penetration of biofuels in the national liquid fuel supply</li> <li>Decrease content of aromatics, benzene and sulphur in Petrol</li> </ul>	Planned	<ul style="list-style-type: none"> <li>Job Creation</li> <li>Sustainable development</li> <li>Reduce air pollution</li> <li>Development and transfer of skills</li> </ul>		

Sector / sub-sector /Thematic Areas		Response measure	Climate Change Flagship programmes	Policy/Instrument/Strategy/ Action	Description	Status	Co-benefits
AFOLU	Expanded Public Works Programmes	Working for Ecosystems, Land & Energy	The Climate Change Response Public Works Flagship Programme	<ul style="list-style-type: none"> <li>The National Forests Act, No. 84, 1998</li> <li>White Paper on Sustainable Forest Development in South Africa, 1997</li> <li>Kuzuko Lodge Private Game Reserve - thicket restoration project</li> <li>Working for Land use</li> <li>Working for Fire</li> </ul>	<ul style="list-style-type: none"> <li>White paper/regulation - Promotes the sustainable management and use of natural forests and woodlands as well as forest plantations in South Africa</li> <li>Kuzuko Lodge - the project will restore degraded thickets in the project area in Eastern Cape, SA, by planting cuttings of the indigenous thicket tree <i>Portulacaria afra</i> Jacq. (<i>P.afra</i> or <i>spekboom</i>) in the project area.</li> <li>Working for Land Use - the objective of this programme is to manage natural resources, in order to alleviate bush infringement/thickening, as well as loss of top-soil.</li> <li>Working for Fire - this programme include enhanced human safety and the setup of high quality fire and land management customs to prevent harm to goods and life</li> </ul>	Current	<p>Sustainable forest management:</p> <ul style="list-style-type: none"> <li>Resource management</li> <li>Biodiversity benefits</li> <li>Socio-economic and environmentally sustainable growth</li> </ul> <p>Kuzuko Lodge:</p> <ul style="list-style-type: none"> <li>Creating skilled and unskilled employment opportunities for labourers employed for plantations.</li> <li>Contributing to local capacity building, environmental education, awareness and knowledge transfer.</li> </ul> <p>Working for programmes:</p> <ul style="list-style-type: none"> <li>Increased resilience of the ecosystem</li> <li>Create new job opportunities</li> <li>Socio-economic benefits for local residents, which ultimately contributes to the Expanded Public Works Programme (EPWP)</li> </ul>
		Biogas projects	Waste Management Flagship Programme	refer to energy sector	refer to energy sector	Current	refer to energy sector
Waste	Waste Management Strategy	Composting projects	Waste Management Flagship Programme	National Organic Waste Composting Strategy	The strategy has been developed to promote composting as a method of beneficiating organic waste, and to divert organics from landfill disposal.	Current	<ul style="list-style-type: none"> <li>Reduces dependence on landfilling waste, together with associated risk of greenhouse gas emissions (i.e. Methane);</li> <li>Reduce waste disposal costs;</li> <li>reduces risk of organic compounds possibly polluting groundwater;</li> <li>Skills development &amp; training as well as job creation.</li> </ul>
		Landfil gas projects	Waste Management Flagship Programme	refer to energy sector	refer to energy sector	Current	refer to energy sector
		Material recovery facilities	Waste Management Flagship Programme	<ul style="list-style-type: none"> <li>Green fund Programme: Waste Beneficiation Centre</li> <li>Municipal Solid Waste Strategy</li> </ul>	The project entails the construction of a waste management and beneficiation centre with incubator and training facilities. This will promote the creation of entrepreneurial skills for community based recycling of selected waste streams; including e-waste, plastic and glass. Facilities will include production of compressed earth block yard, an e-waste processing centre, a plastics collection warehouse, a glass collection warehouse and a training block.	Current	Conserve space in existing landfills.
		SASOL coal-to-gas switch	No	refer to energy sector	refer to energy sector	Completed	refer to energy sector

Sector / sub-sector /Thematic Areas		Response measure	Climate Change Flagship programmes	Policy/Instrument/Strategy/ Action	Description	Status	Co-benefits
Other/cross cutting	Industrial feed	CNG industry fuel switch	No	CNG industry fuel switch	Promoting the use of natural gas as an alternative energy source for industry	Current	<ul style="list-style-type: none"> <li>• Reduce air pollution</li> <li>• Job creation</li> </ul>
	CDM	Clean Development mechanism (excl. EE)	No	International Market Mechanisms (CDM and VCS)	South Africa is participating in the international market mechanism such as the Clean Development Mechanism (CDM) and Verified Carbon Standard (VCS). There are various projects that have been issued with credits ( See BUR2, 2016)	Current	<ul style="list-style-type: none"> <li>• Market for carbon credits</li> <li>• Sustainable development</li> </ul>
	CCS	Carbon Capture and Storage	No	The South African Centre for Carbon Capture and Storage	The South African Centre for Carbon Capture and Storage is responsible for the implementation of a roadmap for evaluating the potential for carbon capture and storage, as well as a testing and demonstration plant to store process emissions from an existing high carbon emission facility	Planned	<ul style="list-style-type: none"> <li>• Reduce air pollution;</li> <li>• Transfer and development of skills and expertise.</li> <li>• Job creation</li> </ul>
	Financial	Levies and/taxes	No	<ul style="list-style-type: none"> <li>• Environmental levy on non-renewable sources</li> <li>• CO2 levy on new fossil fuel vehicles</li> <li>• Carbon tax (2019)</li> </ul>	Market instruments used to create a disincentive for contributing to GHG emissions	Current and Planned	<ul style="list-style-type: none"> <li>• Transparent electricity and or carbon pricing</li> <li>• Reduce air pollution</li> <li>• Facilitate transition to green economy</li> </ul>
	Incentives	DTI Incentive schemes	No	IPAP, National Industrial Policy Framework	The incentive schemes that cover green technologies include the: <ul style="list-style-type: none"> <li>• Capital Projects Feasibility Programme;</li> <li>• Critical Infrastructure Programme; and</li> <li>• Manufacturing Competitiveness Enhancement Programme.</li> </ul>	Current	<ul style="list-style-type: none"> <li>• Increase competitiveness of South African manufacturing companies;</li> <li>• Create new job opportunities;</li> <li>• Socio-economic and sustainable growth.</li> </ul>
	Private sector	Nationl Business Initiative: Voluntary Carbon disclosure	No	Carbon Disclosure Project	<ul style="list-style-type: none"> <li>• Voluntarily reporting to the Carbon Disclosure Project</li> <li>• Different companies have taken and are taking the initiative to implement several projects to reduce their emissions.</li> </ul>	Current	<ul style="list-style-type: none"> <li>• Reduce air pollution</li> <li>• Transparency, information sharing and transfer of skills</li> </ul>

## Summary

DEPARTMENT	PROGRAMME	SUBPROGRAMME	2011/12	2012/13	2013/14	2014/15*	2015/16	2016/17	2017/18	TOTAL
DEPARTMENT OF AGRICULTURE, FORESTRY AND FISHERIES	Programme 6: Fisheries	Aquaculture	24,976	28,739	35,822	30,835	32,298	34,010	36,152	222,832
		Fisheries Research and Development	46,664	52,693	56,989	55,113	57,575	60,625	64,445	394,104
		Management	104	925	748	2,065	2,168	2,283	2,427	10,720
		Marine Living Resources Fund	201,173	316,365	253,545	251,331	258,623	268,441	281,864	1,831,342
		Marine Resources Management	15,072	17,382	17,975	19,137	19,653	20,694	21,998	131,911
		Monitoring Control and Surveillance	63,963	68,226	72,571	69,295	72,950	76,818	81,656	505,479
	Programme 5: Forestry And Natural Resources Management	Forestry Operations	404,268	429,423	468,206	468,412	469,531	487,978	516,102	3,243,920
		Forestry Oversight and Regulation	38,142	46,221	48,358	56,495	55,092	57,992	61,107	363,407
		Management	4,652	1,953	4,296	6,580	6,516	3,939	3,759	31,695
		Natural Resources Management	452,550	714,188	623,839	817,168	375,425	404,133	406,481	3,793,784
COOPERATIVE GOVERNANCE AND TRADITIONAL AFFAIRS	Programme 4: National Disaster Management Centre	Disaster Relief Transfers	47,283	74,030	264,344	260,952	364,343	381,467	423,713	1,816,132
		Municipal Disaster Recovery Grant	-	-	118,340	194,253	188,900	140,000	-	641,493
DEPARTMENT OF ENERGY	Programme 6: Clean Energy	Climate Change and Designated National Authority	3,274	3,602	4,802	4,098	7,482	7,858	8,310	39,426
		Energy Efficiency	418,839	1,025,376	1,347,547	1,805,850	608,429	587,578	712,286	6,505,905
		Renewable Energy	73,618	64,340	137,538	167,693	71,416	27,352	66,865	608,822
	Programme 4: Electrification and Energy Programme and Project Management	Integrated National Electrification Programme	3,264,539	3,106,371	3,907,895	4,177,086	5,741,708	5,996,367	6,353,231	32,547,197
	Programme 2: Energy Policy And Planning	Electricity, Energy Efficiency and Environmental Policy	5,901	5,181	11,637	6,234	7,782	8,171	8,624	53,530
	DEPARTMENT OF ENVIRONMENTAL AFFAIRS	Programme 1: Administration	Corporate Affairs	158,031	189,988	195,822	175,406	274,117	248,049	243,576
Environmental Advisory Services			43,763	57,628	106,648	109,567	105,523	108,475	114,666	646,270
Environmental Sector Coordination			41,882	48,762	48,811	57,750	59,907	63,572	66,744	387,428
Financial Management			26,496	39,891	51,617	57,104	61,348	65,138	69,074	370,668
Management			44,433	41,474	110,261	112,548	53,375	56,372	59,914	478,377
Office Accommodation			65,035	297,832	251,867	153,866	159,779	149,478	156,952	1,234,809
Programme 5: Biodiversity And Conservation		Biodiversity and Conservation Management	4,926	7,061	11,284	14,824	17,019	17,927	18,966	92,007
		Biodiversity Economy and Sustainable Use	-	-	17,829	14,668	16,618	18,788	19,865	87,768
		Biodiversity Monitoring and	-	-	6,459	5,783	6,206	6,519	6,892	31,859
		Biodiversity Planning and	33,776	42,872	19,442	22,225	26,025	27,161	28,724	200,225
		iSimangaliso Wetland Park Authority	25,847	26,990	28,790	30,610	31,628	33,031	34,523	211,419
		Protected Areas Systems	24,627	40,825	35,753	42,372	47,280	50,042	52,373	293,272
		South African National Biodiversity Institute	205,387	194,448	208,684	223,447	232,149	242,973	254,928	1,562,016
		South African National Parks	184,964	256,216	237,421	275,068	278,675	277,939	290,336	1,800,619



DEPARTMENT	PROGRAMME	SUBPROGRAMME	2011/12	2012/13	2013/14	2014/15*	2015/16	2016/17	2017/18	TOTAL
DEPARTMENT OF ENVIRONMENTAL AFFAIRS	Programme 7: Chemicals And Waste Management	Chemicals and Waste Management	814	6,481	4,337	5,205	6,904	7,153	6,482	37,376
		Chemicals and Waste Policy, Evaluation and Monitoring	2,733	9,566	4,432	16,915	11,353	11,799	12,345	69,143
		Chemicals Management	835	3,994	11,530	7,843	10,041	10,617	11,244	56,104
		General Waste and Municipal Hazardous Waste Management and Licensing	29,357	33,090	26,211	27,341	28,978	31,000	32,673	208,650
			2,110	5,403	26,603	14,906	22,005	23,504	25,056	119,587
	Programme 4: Climate Change And Air Quality	Air Quality Management	33,897	28,889	32,535	37,592	39,846	42,549	45,014	260,322
		Climate Change Adaptation	4,080	2,869	3,656	4,267	4,535	4,771	5,051	29,229
		Climate Change Management	127,957	5,829	5,438	6,830	7,215	7,576	8,012	168,857
		Climate Change Mitigation	5,126	6,724	7,523	7,766	8,168	8,651	9,176	53,134
		Climate Change Monitoring and Evaluation	-	3,035	8,403	9,283	9,605	10,018	10,625	50,969
		International Climate Change Relations and Negotiations	-	9,604	9,262	9,481	10,357	11,032	11,660	61,396
		South African Weather Service	138,205	150,581	162,943	152,489	160,423	209,985	199,482	1,174,108
	Programme 6: Environmental Programmes	Environmental Programmes Management	-	-	5,288	6,154	6,462	7,516	7,993	33,413
		Environmental Protection and Infrastructure Programme	869,328	1,258,589	1,297,270	1,331,138	1,358,951	1,602,767	1,566,688	9,284,731
		Green Fund	-	88,774	250,000	250,000	300,000	180,000	110,455	1,179,229
		Information Management and Sector Coordination	-	-	22,123	45,159	47,530	68,547	72,722	256,081
		Working for Water and Working on	1,107,584	1,446,210	1,563,043	1,955,074	1,933,921	2,208,974	2,300,979	12,515,785
	Programme 2: Legal, Authorisations And Compliance	Compliance Monitoring	28,996	13,596	14,189	19,472	20,313	24,760	26,210	147,536
		Corporate Legal Support and Enforcement	-	13,211	8,035	8,760	9,342	9,881	10,461	59,690
			-	19,293	23,229	24,242	26,024	26,537	28,131	147,456
		Integrated Environmental Authorisations	41,694	52,163	38,721	45,035	50,653	50,019	52,572	330,857
		Law Reform and Appeals	-	10,166	12,531	14,156	15,052	15,927	16,887	84,719
		Legal, Authorisations and Compliance Management	3,278	6,023	6,229	5,908	6,133	6,318	6,691	40,580
	Programme 3: Oceans And Coasts	Integrated Coastal Management	28,973	40,989	37,498	71,554	146,043	162,928	166,913	654,898
		Oceans and Coastal Research	57,135	117,097	95,598	87,985	117,941	124,999	131,116	731,871
		Oceans and Coasts Management	32,809	14,857	6,169	7,481	7,898	8,285	8,757	86,256
		Oceans Conservation	757,421	351,641	182,513	207,811	206,667	219,643	230,354	2,156,050
Specialist Monitoring Services		-	-	4,310	5,301	5,980	6,259	6,641	28,491	
DEPARTMENT OF HEALTH	Programme 4: Primary Health Care Services	Environmental and Port Health Services	93,889	99,121	104,624	110,697	130,095	135,213	144,789	818,428
		Assistance to Mines	-	-	-	-	5,000	5,275	5,555	15,830
DEPARTMENT OF MINERAL RESOURCES	Programme 4: Mineral Policy and Promotion	Council for Geoscience	154,405	223,006	271,232	292,839	325,914	357,627	348,978	1,974,001
		Council for Mineral Technology	196,956	253,531	364,709	370,854	390,742	311,416	299,287	2,187,495
		Mine Environmental Management	17,607	6,581	7,273	9,165	50,369	115,793	121,637	328,425
	Programme 3: Mineral Regulation	Management Mineral Regulation	12,958	9,277	15,087	21,116	40,322	44,123	49,662	192,545
		Mineral Regulation and	132,064	140,517	145,610	167,789	169,594	178,837	188,430	1,122,841

# National allocation of Public Environmental Expenditure (ZAR'000)

## Annexure E

DEPARTMENT	PROGRAMME	SUBPROGRAMME	2011/12	2012/13	2013/14	2014/15*	2015/16	2016/17	2017/18	TOTAL
<b>PUBLIC ENTERPRISES</b>	Programme 3: Portfolio Management and Strategic Partnerships	Economic Impact and Policy Alignment	11,744	9,990	9,687	11,570	12,946	13,903	14,887	84,727
		<b>PUBLIC WORKS</b>	Programme 3: Expanded Public Works Programme	377,637	529,191	727,657	746,143	810,160	996,759	1,054,449
<b>DEPARTMENT OF SCIENCE AND TECHNOLOGY</b>	Programme 5: Socio-Economic Innovation Programme 2: Technology Innovation	Sector Innovation and Green Economy	739,090	833,595	812,750	878,626	881,319	925,015	965,252	6,035,647
		Hydrogen and Energy	145,641	131,881	139,861	146,396	152,339	152,551	160,193	1,028,862
<b>DEPARTMENT OF TRADE AND INDUSTRY</b>	Programme 6: Incentive Development and Administration	Manufacturing Incentives	2,100,813	2,954,767	3,338,623	3,611,047	3,781,822	4,005,840	3,561,728	23,354,640
<b>DEPARTMENT OF TRANSPORT</b>	Programme 2: Integrated Transport Planning	Research and Innovation	3,955	7,946	7,364	13,722	10,356	11,006	11,624	65,973
		Public Transport Industry Development	98,848	104,905	111,678	121,454	178,832	188,220	198,534	1,002,471
	Programme 7: Public Transport	Public Transport Network Development	2,829	5,966	4,338	12,013	17,273	18,015	18,725	79,159
		Public Transport Oversight	9,234,479	9,625,567	10,350,785	11,145,566	11,260,305	11,703,135	12,510,627	75,830,464
		Rural and Scholar Transport	-	4,011	7,216	13,118	47,147	65,403	74,367	211,262
<b>DEPARTMENT OF WATER AND SANITATION</b>	Programme 1: Administration	Programme Management Unit	-	156,785	378,048	-	4,860	48,885	55,458	644,036
	Programme 4: Water and Sanitation Services	Water Sector Support	731,493	217,451	250,401	243,552	257,175	294,076	309,335	2,303,483
	Programme 3: Water Infrastructure Development	Water Services Infrastructure	2,978,837	3,914,185	4,903,977	6,349,057	9,684,786	10,026,734	10,834,894	48,692,470
	Programme 2: Water Planning and Information Management	Integrated Planning	178,760	162,805	182,209	196,454	201,813	212,632	221,628	1,356,301
		Water Ecosystems	35,578	32,069	46,943	59,308	66,648	71,548	74,970	387,064
		Water Information Management	443,300	458,624	379,341	592,948	533,209	568,344	580,995	3,556,761
		Water Planning, Information Management and Support	3,445	3,428	4,667	6,344	6,985	7,519	7,483	39,871
	Programme 5: Water Sector Regulation	Compliance Monitoring	2	14	626	17,379	60,355	67,279	71,252	216,907
		Economic and Social Regulation	-	63	-	3,940	5,965	7,101	7,545	24,614
		Enforcement	8,227	9,529	12,838	14,573	28,886	30,131	31,763	135,947
		Institutional Oversight	109,495	117,688	105,091	49,820	45,268	51,364	53,771	532,497
		Water Sector Regulation Management and Support	308	282	852	8,652	6,231	6,752	7,355	30,432
		Water Supply Services and Sanitation Regulation	20,969	23,892	23,083	35,236	23,270	23,057	23,128	172,635
		Water Use Authorisation and Administration	61,647	53,594	54,624	50,341	61,364	69,591	121,580	472,741
	<b>TOTAL</b>			<b>27,091,493</b>	<b>30,987,937</b>	<b>35,335,953</b>	<b>39,372,702</b>	<b>43,539,230</b>	<b>45,746,329</b>	<b>47,716,824</b>

Source: High-level Public Environmental Expenditure Review Discussion Paper, 2016, which provides the source as: "National Treasury (Various Years): 2015 - National Expenditure Database

\* Revised estimate

High-level overview of priority sectors for private sector investment

*Energy generation*

Over the period 2011 to 2018<sup>79</sup>, South Africa’s Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) has attracted close to R200bn in investment from 91 approved projects (mainly solar PV and onshore wind). After an extended delay in the REIPPPP, since 2015, the recent signing of agreements for 27 renewable energy projects (from bid windows 3.5 and 4), created a much-needed boost of confidence about South Africa’s commitment to establishing a viable, low-cost, sustainable energy mix.

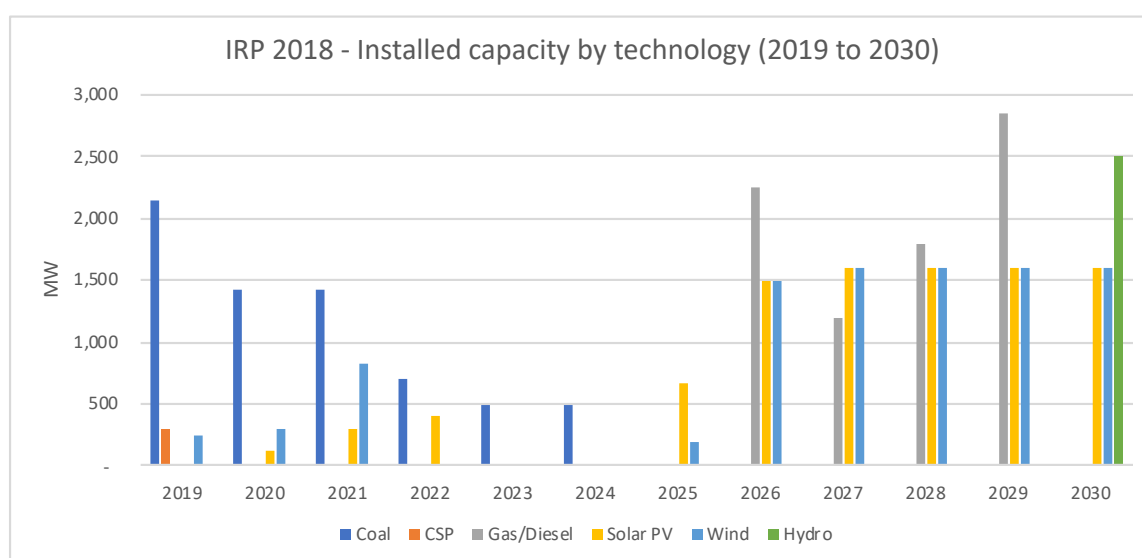
The long-awaited draft Integrated Resource Plan (IRP 2018) was also released in August 2018 and is open for public comment until November 2018. The draft plan signals a shift away from coal and nuclear power, with an increased adoption of gas and renewable energy.

The revised plan proposes decommissioning of 83% (35 GW of 42 GW currently operating) of state-owned coal generation capacity by 2050, i.e.12 GW by 2030, a further 16 GW by 2040 and an additional 7 GW by 2050<sup>80</sup>. The plan also proposes a significant increase in renewables-based generation from wind and solar as well as gas-based generation capacity by 2030 and beyond, with no further new nuclear capacity envisaged.

According to the draft IRP 2018, the key assumptions that have changed and which necessitated the revision of the promulgated IRP 2010, include:

- Electricity demand projections have not increased as envisaged;
- Eskom’s existing plant performance is way below the 80% availability factor; and
- Additional capacity has been committed to and commissioned; and
- Significant decline in technology costs.

Even though solar PV and wind generation are expected to increase substantially, accounting for roughly 16% and 15%, respectively, of installed capacity by 2030, the draft IRP 2018 proposes a delay in the roll-out of this additional capacity to the period between 2025 and 2030, as shown in the below graph.



Source: Draft IRP 2018, adapted from Table 7

<sup>79</sup> Includes the 27 Power Purchase Agreements signed by Eskom in April 2018, totalling some R56bn in additional investment

<sup>80</sup> <http://www.energy.gov.za/IRP/irp-update-draft-report2018/IRP-Update-2018-Draft-for-Comments.pdf>

Based on the draft IRP 2018, coal-based installed capacity (in MW) as a percentage of the total energy mix is expected to decline from roughly 60% in 2018 to approximately 45% by 2030. This decline, takes into account the decommissioning of coal plants with combined installed capacity of 12GW by 2030.

While the implementation of the proposed IRP 2018 may bring South Africa close to meeting the upper range of its 2030 NDC target, South Africa will still need to adopt more ambitious targets to meet its NDC, such as expanding renewable energy capacity beyond 2030, phasing out coal, substantially limiting natural gas use by 2050, as well as work on other sectors like transport, industry and buildings.<sup>81</sup>

Even though the recent (April 2018) signing of the outstanding power purchase agreements (from Bid Window 3.5 and 4) by the DoE and Eskom have created some positive momentum for the renewables energy sector, market commentators note the potential uncertainty that remain around South Africa's proposed energy mix, given the expected pushback by unions and industry toward the proposed IRP update as well as Eskom's ongoing financial struggles.

### *Energy efficiency*

Energy is pivotal to South Africa's economic growth. However, the carbon intensity of energy consumption and the widespread inefficient use of this energy, means that energy efficiency (EE) is, understandably, a major feature of South Africa's national climate change (mitigation) response.

EE has been the largest contributor to climate change mitigation in South Africa, accounting for approximately 82% of GHG emission reductions since 2010.<sup>82</sup> The Energy Efficiency and Demand Management Flagship Programme (EEDMFP) thus ranks high amongst the national climate change flagship programmes in terms of importance and readiness to scale. While this programme comprises EE in industry and in private, commercial and public buildings, provinces and municipalities have only addressed EE to a very limited extent, despite the substantial size of the public sector building portfolio.

As a result, the Energy Efficiency in Public Infrastructure and Buildings Programme (EPIBP) was launched [in 2017], under the leadership of the DOE, in collaboration with the Department of Public Works (DPW), DEA, the NBI and Carbon Trust. The EPIBP is structured as follows<sup>83</sup>:

- **Financial Component:** a Project Preparation Facility enables provinces and municipalities to develop bankable EE investment plans for their public buildings. A Guarantee Fund supports private Energy Services Companies (ESCOs) in raising the necessary finance for entering energy services contracts with the public owners of these buildings to finance and implement these plans.
- **Technical Component:** a Service Desk advises provinces and municipalities on EE opportunities in public buildings by helping to raise awareness, understand the potential for EE and associated profits and carbon savings, set baselines and targets and identify concrete energy saving opportunities. The desk supports the government in measuring the EPIBP's results and supports further development of mechanisms that promote energy efficiency.
- EPIBP uses NAMA Facility funding to mobilise public and private sector investments in public buildings in a 1 to 3.3 ratio (overall NAMA Facility contribution in relation to loans for energy efficiency measures issued by the end of the project and 1 to 7.7 after 10 years). It contributes to market development for energy services and new ways of government coordination (vertical/horizontal).

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<sup>81</sup> <https://climateactiontracker.org/countries/south-africa/>

<sup>82</sup> DEA, 2017

<sup>83</sup> <http://www.nama-facility.org/projects/energy-efficiency-in-public-buildings-and-infrastructure-programme-eebjp/>

From a private sector perspective (industry and residential), the USAID undertook a study<sup>84</sup>, which assessed the cost-effectiveness and energy saving potential of a range of EE opportunities in the industrial and the residential market. The study attempted to support the prioritisation of the top 10 EE opportunities by considering i) Cost-effectiveness, ii) energy savings potential and iii) likelihood of success (based on six indicators: market transformation potential, political feasibility, program complexity, environmental aspects, economic aspects, and equity). Based on this assessment, the following four EE opportunities achieved the highest priority for early implementation:

1. Residential Lighting;
2. Industrial Motors;
3. Residential Water Heating; and
4. Commercial Lighting.

A number of barriers exists that have slowed the uptake of EE in both the public and private sector. These include:

Category	Barriers
Policy	<ul style="list-style-type: none"> <li>• Regulatory framework for EE, including monetary and non-monetary incentives is not fully developed</li> <li>• Lack of monitoring of energy consumption and benefits of EE interventions not yet systematically measured, reported and verified</li> <li>• Government incentive and policy structure is not well understood and /or incomplete</li> </ul>
Technical	<ul style="list-style-type: none"> <li>• Procurement complexities and costs</li> <li>• Access to incentives/subsidies</li> <li>• Lack of modelled procurement procedures to enter into 3 year or longer leases</li> <li>• Fragmented and poor-quality data and/or analysis</li> </ul>
Capacity	<ul style="list-style-type: none"> <li>• Insufficient capacity to develop bankable investment plans or apply existing financial support mechanisms</li> <li>• Lack of capacity in respect of support programmes for provinces and municipalities</li> <li>• Insufficient capacity to assess EE potential of opportunities</li> <li>• Insufficient capacity in ESCO's to provide energy services</li> <li>• Insufficient capacity in financial institutions to evaluate energy services business plans</li> </ul>
Financial	<ul style="list-style-type: none"> <li>• ESCO's (especially (SMMEs) typically do not have strong balance sheets and struggle to raise external debt funding</li> <li>• The finance community are reluctant to fund EE, due to prevailing uncertainty related shared benefits of EE measures within ESCO model</li> <li>• Access to national incentive mechanism for EE is complex</li> </ul>
Market	<ul style="list-style-type: none"> <li>• The private ESCO industry is still nascent/emerging</li> </ul>

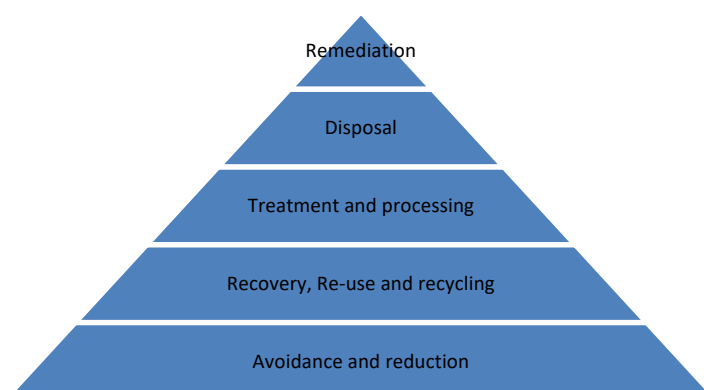
<sup>84</sup> USAID Energy Efficiency Opportunity Study – South Africa, undated, but reference made to 2016 data

Through the EEPIBP, government plans to address some of the above barriers by:

- Provide financial support to the public sector to develop bankable energy efficiency investment plans
- Provide support to private sector energy services companies (ESCO's) to obtain loans from financing institutions to finance energy efficiency interventions in public buildings and to mature the ESCo industry
- Provide support to the public sector through a 'one-stop-shop' Energy Efficiency Project Support Office with tailor-made support for access to subsidy and incentive mechanisms including hands-on-support through secondment of Energy Efficiency Managers.
- Provide support and capacity building to various target groups in both the public and private sector
- Provide support for the further development of framework conditions for energy efficiency interventions in public buildings of all spheres of government and
- Enhance the MRV-system

### Waste

The Department of Environmental Affairs promulgated the National Environmental Management: Waste Act 59 of 2008 (Waste Act) and developed the National Waste Management Strategy (NWMS) during 2010/11. A key framework that developed from the Waste Act and the NWMS is the internationally recognised Waste hierarchy (see below graphic). The Waste hierarchy promotes cleaner production, waste avoidance or minimisation, re-use, recycling and waste treatment with disposal viewed as a last resort.



Source: DEA

The *Waste Classification and Management Regulations* and the *Norms and Standards for the Assessment of Waste for Landfill* and the *Norms and Standards for the Disposal of Waste to Landfill* were published during 2013, for immediate implementation. These regulations were aimed at enabling and promoting:

- the improved and more efficient classification and management of waste;
- the safe and appropriate handling, storage, recovery, reuse, recycling, treatment and disposal of waste accurate, including accurate and relevant reporting on waste generation and management.
- the beneficial use of resources from waste that does not harm the environment or health and the diversion of waste from landfill.

Despite these developments, disposal continues to dominate the South African waste management landscape.<sup>85</sup>

<sup>85</sup> Greencape, Waste: Market Intelligence Report, 2018

According to Greencape<sup>86</sup> the DEA estimates that the waste sector contributed R24.3bn to the South African GDP in 2016 and DEA expects that a further R11bn per year could be unlocked by 2023 by diverting up to 20m tonnes of waste from landfills and thereby creating 45,000 additional formal jobs, 82,000 indirect jobs and the creation of 4300 SMMEs.

DEA's overall target is to increase waste diverted from landfill from 14m tonnes or 13% (2016) to 29m tonnes or 25%<sup>87</sup> by 2023.

The Greencape<sup>88</sup> has identified the following potential opportunities within the waste sector:

- **Organic Waste:** Solutions are needed for municipal green waste, abattoir waste and the organic component of municipal solid waste. There is also significant investment potential (R100m) for biogas generation from municipal organic waste.
- **e-Waste:** promulgation of e-Waste Industry Waste Management Plan (IndWMP) is expected to promote processing of e-waste and create a market or feedstock for dismantlers and refurbishers of electronic equipment.
- **Plastic:** The promulgation of the paper and packaging IndWMP is expected to unlock greater volumes of clean feedstock and more business support for the sub-sector, with further support from Project Phakisa<sup>89</sup>. There is also a need (and opportunity) for thermal treatment technologies for dirty and/mixed plastics, refuse derived fuels and thermoform PET.
- **Builders' Rubble:** Builders rubble as an alternative to virgin materials, is a growing market. The national government and municipalities are increasingly focusing on diverting builders' rubble from landfill sites. The increase in price of virgin material, combined with rise in green procurement and reduction in 'red tape' are expected to unlock the re-use potential of builders' rubble.
- **Municipal contracts:** A number of municipalities will require investment in waste related infrastructure over the next 3 years. This may present opportunities for long-term Public Private Partnerships (PPP) on the Build Operate and Transfer model (BOT) for the development, expansion, operation and maintenance of waste-related infrastructure, not only in the Western Cape, but nationally. [paraphrased]
- **Industrial Symbiosis:** Solutions for slag, paper/pulp effluent, treated wood, foundry sand, laminated glass and cardboard cores (amongst other), present opportunities for the private sector to collaborate and achieve a competitive advantage, where the waste or by product of one company or sector becomes the raw materials for another.

According to Greencape, the dwindling landfill space and the rising costs of (municipal) waste management, are pushing up the price of landfilling. As a result, alternative waste treatment solutions (are likely to) become more financially viable with the increase in demand from waste generators for alternative waste treatment solutions.

The Diversion of Municipal Waste (DMW) from landfill component of the Waste Management Flagship Programme aims to strengthen the enabling environment for the uptake of projects that divert waste from landfills and promotes the proper implementation of the waste hierarchy.

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<sup>86</sup> Greencape, Waste: Market Intelligence Report, 2018

<sup>87</sup> Based on 2012 waste figures

<sup>88</sup> Greencape, Waste: Market Intelligence Report, 2018

<sup>89</sup> A cross-sector, fast-results delivery programme launched in 2014 to help implement the NDP 2030.

The DMW from landfill project focuses on<sup>90</sup>:

- Developing of a scaled-up programme that demonstrates and promotes implementation of the waste hierarchy by employing a fit-for-purpose combination of mechanical and biological treatment methods in 5 municipalities;
- Packaging the scaled-up programme into a NAMA and fundable programme; and
- Submitting the packaged programme for funding, to support municipal implementation.

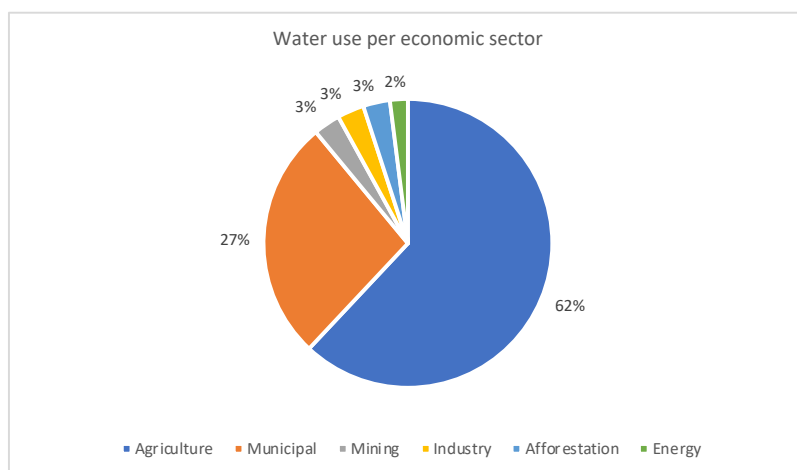
Due to its high mitigation potential and in order to minimise the financial burden on municipalities, the DMW from Landfill work package is initially piloting five technologies<sup>91</sup> for the diversion and /or alternative treatment of organic waste at six municipalities. The pilot projects will be scaled during the second phase, by implementing similar projects at between 24 and 39 additional municipalities across the country. At least 30 municipalities are targeted to have fully operational projects by 2024, with a total of 226 municipalities being identified as suitable for the DMW from landfill intervention, in terms of size and urban character.

*Water*

South Africa is a highly water stressed country, with extreme rainfall fluctuations. It is ranked as the 30<sup>th</sup> driest country in the world. According to the WWF South Africa, “Half of our country’s river flow is provided by a tiny 10% of land area. Yet, most [84%] of this land is not protected.”<sup>92</sup>

According to DWS, “South Africa has a reliable yield, (at 98% assurance of supply), of only about 15 billion m<sup>3</sup>/annum, comprising 68% surface water, 13% groundwater, 13% return flows and 6% from other sources, such as desalination. It is estimated that return flows from irrigation, urban domestic uses and bulk industrial and mining effluents could offer re-use opportunities of up to 1.9 billion m<sup>3</sup>/annum.”<sup>93</sup>

Water consumption in South Africa is estimated at 233 litres/capita/ day (lt/c/d), which is c. 30% higher than the international benchmark of 180 lt/c/d.<sup>94</sup> At 2015/2016, the current use was estimated at between 15 billion and 16 billion m<sup>3</sup>/annum, split as follows:



Source: DWS, Strategic Overview of the Water Services Sector in South Africa 2015

<sup>90</sup> DEA, Annexure I, Consolidated 3<sup>rd</sup> CCAR, 2017, draft

<sup>91</sup> Open window composting, In-vessel composting, Nutrient upscaling, Containerised composting and Anaerobic digester  
[http://www.wwf.org.za/our\\_work/water/](http://www.wwf.org.za/our_work/water/)

<sup>93</sup> DWS, Strategic Overview of the Water Services Sector in South Africa 2015

<sup>94</sup> Greencape, Market Intelligence Report, Water, 2018



National water demand is projected to increase to 18 billion m<sup>3</sup>/annum by 2030, due to population growth and industrial development.<sup>95</sup> Without drastic action, South Africa is unlikely to safely meet this demand.

The recent droughts (2015 to 2017) and subsequent water use restrictions, combined with high tariff increases, have brought into sharp focus, the importance of water security for all South Africans, including industry.

The Water Services Act of 1997 and the National Water Act (NWA) of 1998 are key policies that govern South Africa's water. The Water Service Act defines the role of DWS as regulator, the role of Water Boards as bulk providers and the role of municipalities as service providers. "The NWA contains comprehensive provisions for the protection, use, development, conservation, management and control of South African water resources, while the strategic objectives are stipulated in the National Water Resource Strategy (NWRS; DWAF 2013). Transformation in the water resource sector includes a shift from central management to decentralised institutions, including the establishment of Water Management Areas, defined largely by hydrological catchment borders, and administered by Catchment Management Agencies."<sup>96</sup>

DWS operates at national, provincial and local levels across all elements of the water cycle, i.e. from water resource management, water abstraction, water processing and distribution of potable water, wastewater collection, to treatment and discharge. However, DWS does not execute all these functions as some are constitutionally assigned to sector partners. Regional bulk water distribution is managed by water boards, municipalities and the DWS. A wide range of water resources management functions within a catchment area may be delegated to Catchment Management Agencies, (CMAs), which are in the process of being established, while Irrigation Boards, (in the process of being transformed into Water User Associations (WUAs)), operate at a local level, managing water-related activities. River health and related catchment management functions are shared between the DWS and the DEA.

The DWS' other key partners include, the Water Research Commission (WRC), the South African Local Government Association (SALGA), the DBSA, the Trans Caledon Tunnel Authority (TCTA), the Water Institute of South Africa (WISA), universities and technikons.

The foundation for South Africa's various water and sanitation programmes stem from the following policy documents:

- Medium Term Strategic Framework (MTSF): Outcome 6 is an efficient, responsive and competitive, economic, infrastructure network.
- National Infrastructure Plan (2012): SIP 16, which aims to address backlogs and upgrades to municipal water, sanitation and electricity bulk infrastructure. SIP 18 which aims to address water and sanitation backlogs, as well as the maintenance and construction of waste water treatment works. It also aims to consolidate water services institutions and implement water leak management and water demand awareness programmes.

According to Greencape, the recent droughts and longer-term water constraints are key drivers for investment in the water sector, in particular the demand for technologies and water services that enable resilience to water scarcity [especially] in urban markets.<sup>97</sup>

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<sup>95</sup> WWF-South Africa, Water: Facts and Futures, Rethinking South Africa's Water Future, 2016

<sup>96</sup> WWF-South Africa, Water: Facts and Futures, Rethinking South Africa's Water Future, 2016

<sup>97</sup> Greencape, Market Intelligence Report, Water, 2018

Greencape has identified the following four key areas for new investment:

1. **Water metering and monitoring:** the demand for private sector smart water metering systems is increasing, in order to improve water management. New residential and commercial developments represent key markets for these devices and services.
2. **Water efficiency:** Halving water losses will mean an annual saving of over R2 billion<sup>98</sup>, excluding additional income from improved metering and billing. This indicates a significant market for Water Conservation and Demand Management projects that reduce water loss and non-revenue water (NRW)<sup>99</sup>;
3. **Water reuse in the industrial sector:** This presents opportunities for technology and service providers to target water-intensive users in the industrial sector, as well as municipalities who are interested in potable water reuse from wastewater.
4. **Alternative water supply:** Large scale seawater desalination in the coastal regions of South Africa, is an emerging market for [private sector] investors. There are also a number of private sector investment opportunities relating to groundwater and rainwater systems in the residential and commercial market segments. [DEA in partnership with the Department of Water and Sanitation (DWS) have appointed the Institute of Natural Resources to assist in developing a national rainwater harvesting (RWH) strategy. The purpose of the strategy is to drive the scaled-up and accelerated implementation of rainwater harvesting as a key component of South Africa’s water resource].

Another potential opportunity for the private sector relates to the management of South Africa’s critical catchment areas. The WWF-South Africa has noted<sup>100</sup> the need for increased investment from the private sector and civil society, in order to improve the health of catchment areas. The WWF-South Africa, through its Water Balance Programme has been working with corporates (Nedbank, Woolworths, Sanlam and Sonae Novobord) to increase co-investment in addressing this issue. Government’s Working for Water programme has also offered co-funding to support private clearing operations through the Land User Incentive scheme.

The NBI, in partnership with the Confederation of Danish Industry and Voluntas Advisory, has launched a new project during 2017, titled Kopano ya Metsi (‘meeting for water’), which is focused on unlocking private investment in the water sector. The project aims to assess the current and potential role of the private sector as one of the solutions to address the massive funding gap in the water sector. According to the NBI<sup>101</sup>, an estimated R700 billion in required over the next 10 years for refurbishment and the expansion of water access, with a funding shortfall of around 37%.

Despite the pressing need for investment in the water sector, a number of persistent challenges and barriers are limiting the scale of investment required, particularly from the private sector. These challenges and barriers include<sup>102</sup>:

Category	Barriers
General	<ul style="list-style-type: none"> <li>• Public perception around water reuse, may prevent/slow market growth.</li> <li>• Wastewater is not seen as a business opportunity</li> <li>• Property rights/leasing may increase the complexity of implementing water-related projects</li> <li>• Political interference and socio-economic aspects of water may deter investment.</li> </ul>

<sup>98</sup> DWS, Strategic Overview of the Water Services Sector in South Africa 2015

<sup>99</sup> NRW, (in the South Africa context), includes, (i) Unbilled metered, (ii) Unbilled un-metered, (iii) Apparent losses (illegal connections, inaccurate meters, data /administrative errors) and (iv) Real losses (leaks from the water system)

<sup>100</sup> WWF-South Africa, Water: Facts and Futures, Rethinking South Africa’s Water Future, 2016

<sup>101</sup> NBI, Kopano Ya Metsi, Unlocking water investment in South Africa, 2017

<sup>102</sup> Risks and barriers compiled from the above Greencape and NBI reports

Category	Barriers
Capacity/skills	<ul style="list-style-type: none"> <li>• Shortage of specialised skills in the water service sector (public and private sector)</li> <li>• Lack of adequate or strong technical or leadership skills at municipal level</li> <li>• Lack of knowledge about the finance sector, particularly infrastructure and/project finance</li> <li>• Financial institutions lack the required knowledge about the water sector</li> </ul>
Financial	<ul style="list-style-type: none"> <li>• Water and or water services are not properly priced – tariffs are not cost-reflective</li> <li>• Water projects are typically challenging, due to the relatively low returns and higher risks, especially in emerging markets</li> <li>• Capital costs can limit investment, particularly in the residential market</li> </ul>
Municipal-related	<ul style="list-style-type: none"> <li>• Access to funding - many municipalities have a poor record of tariff collection, resulting in issues related to credit worthiness or indebtedness</li> <li>• Limited revenue base of small rural municipalities</li> <li>• Larger metros may be close to reaching their borrowing limit</li> <li>• Challenges related to governance and limitation/conditions specific to local procurement processes</li> <li>• Lack of ring-fencing of water-related revenue at municipalities</li> <li>• Underspending or inefficient spending of existing government grants</li> </ul>
Market	<ul style="list-style-type: none"> <li>• Not enough good quality projects are being developed to attract interest institutional investors</li> <li>• Currency risk - volatility of the South Africa Rand may limit local actors' ability to access international funding</li> </ul>

Many of the above challenges are not unique to South Africa. They present an opportunity for all relevant role players in South Africa to collaborate in finding innovative solutions to these challenges. At a minimum, solid cashflows underpinned by full cost recovery, good governance and strong technical & leadership skills are essential prerequisites for attracting funding for water-related infrastructure investments.

### *Agriculture; Food Systems and Food Security*

The Agriculture sector accounts for 2.3%<sup>103</sup> of South Africa's GDP and employs roughly 6%<sup>104</sup> of South Africa's labour force.

The agriculture sector is significant in terms of South Africa's development agenda, for two primary reasons<sup>105</sup>:

1. It is a key driver of national jobs, including opportunities for 300,000 households in smallholder schemes by 2020 and the creation of 145,000 in agro-processing jobs by 2020; and
2. It is a catalyst for driving [inclusive] social-economic development, improved livelihoods and infrastructure for the benefit of largely poor rural communities who are most vulnerable to the impacts of climate change.

<sup>103</sup> Statistics South Africa, GDPQ2, 2018 (% based on Total value added at basic prices)

<sup>104</sup> DAFF, Abstract of Agricultural statistics, 2017 (employment data as at September 2016)

<sup>105</sup> DEA, Annexure I, Consolidated 3rd CCAR, 2017, draft

The agriculture sector's policy and regulatory framework, provides the foundation for the development of the government's (relatively new) Agriculture, Food Systems and Food Security Flagship Programme. The Integrated Growth and Development Policy for Agriculture, Forestry and Fisheries (IGDP), highlights the importance of sustainable resource management in growing the sector, while the Agriculture Policy Action Plan (APAP), integrates the themes of agricultural expansion and development, with the themes of climate change and food security.

The Agriculture, Food Systems and Food Security Flagship Programme is led by the Department of Agriculture, Forestry and Fisheries (DAFF) and seeks to enhance South Africa's agricultural productivity and climate resilience. According to DEA<sup>106</sup>, the programme aims to implement comprehensive and complementary mitigation and adaptation response measures that will:

- Increase productivity and production efficiency;
- Reduce risks and to enhance disaster preparedness and management; and
- Enhance sustainability of agricultural and food systems.

The programme is prioritised around the following work packages:

1. Climate Smart Agriculture (CSA) interventions for South Africa's primary agricultural value chains for a changing climate;
2. Skills audit and capacity building (training) for approximately 1000 CSA extension officers and practitioners;
3. Preparation of CSA proposal for GCF funding; and
4. Climate Resilient credit lines.

In order to understand and identify the most appropriate land-use, mitigation and adaptation approaches that hold the greatest agricultural growth /opportunities in the priority agriculture value chains, DAFF (in partnership with DEA) has commissioned a study in February 2018, on the "*Development and Optimisation of CSA Interventions for South Africa's Priority Agriculture Value Chain for a Changing Climate*", funded by the GEF-UNEP. This study is anticipated to be implemented until February 2019.

DEA and The Food and Agriculture Organization of the United Nations (FAO) are also supporting DAFF on a GCF funding application for "*Strengthening Systems, Technologies and Practices for Building Resilient and Climate Smart Smallholder Crop and Livestock Value Chains in Vulnerable Biomes of South Africa*".

The programme seeks to "strengthen local systems/institutions and facilitate commercial as well as market-based development and adoption of technologies and best practices in cereal, horticultural and livestock agricultural ecosystems in the most affected biomes."<sup>107</sup>

The programme aims to catalyses public and private investment in climate smart technologies driven by government support, including the "one household one hectare"<sup>108</sup> programme, the commitment to establishing 300 000 smallholder farmers, the LandCare<sup>109</sup> and Agri-parks<sup>110</sup> Programmes to address resilience.

<sup>106</sup> DEA, Annexure I, Consolidated 3rd CCAR, 2017, draft

<sup>107</sup> DEA, Annexure I, Consolidated 3rd CCAR, 2017, draft

<sup>108</sup> A programme launched by the Minister of the Department of Rural Development and Land Reform (DRDLR) in November 2015, to ensure poverty alleviation, food security, tenure security and access to markets in rural areas. <http://www.ruraldevelopment.gov.za/news-room/news-flash/file/4313>

<sup>109</sup> LandCare is a community based and government supported approach to the sustainable management and use of agricultural resources.

<sup>110</sup> A programme launched by the DRDLR in 2015 to strengthen partnerships between government and private sector stakeholders (mainly smallholder farmers). <http://www.ruraldevelopment.gov.za/agri-parks/362-agri-parks/1170-agri-parks-read-more#.W6ilby17G34>

The Agri-parks programmes seeks to establish agri-parks in all of South Africa's District Municipalities in order to stimulate economic transformation in rural regions. The 3 basic components of the agri-park model are:<sup>111</sup>

1. The Farmer Production Support Unit (FPSU) -a rural small-holder farmer outreach and capacity building unit that links with farmers and markets. The FPSU is responsible for primary collection, some storage, some processing for the local market, and extension services including mechanisation.
2. The Agri-hub (AH) - a production, equipment hire, processing, packaging, logistics, innovation and training unit.
3. The Rural Urban Market Centre (RUMC). The RUMC has three main purposes.
  - i. Linking and contracting rural, urban and international markets through contracts.
  - ii. Acting as a holding-facility, releasing produce to urban markets based on seasonal trends.
  - iii. Providing market intelligence and information feedback, to the AH and FPSU.

Economic growth, urbanisation, food inflation and climate change are factors that are driving innovation in the agriculture sector, both in Africa and globally. The ability to collect, access and mine large volumes of data, using tools such as data capturing devices and sensors, data analytics software using artificial intelligence and machine learning, biotechnology, robotics/automation, is at the heart of this innovation. The African agri-tech market saw a 110% increase in the number of start-up companies operating in Africa over the past two years (2016 and 2017), and over US\$19 million have been invested into the sector in that period.<sup>112</sup>

According to Greencape<sup>113</sup>, the South African Agriculture sector “offer numerous opportunities for investors, green technology manufacturers, service providers, distributors and others in the agriculture value chain.”

These opportunities include:

- **Controlled Environment Agriculture (CEA)** – Due to South Africa's water security concerns and the rising costs of agricultural production, water and cost savings strategies are key drivers of investment in CEA.
- **Drones technologies** – the drone industry (part of precision agriculture) generated R2 billion in 2017.
- **Mobile /ITC applications** – between 2010 and 2015, there was a 400% increase, from 300 000 to 1.5 million, in mobile applications for agriculture. Emerging technologies in mobile applications and software programmes offer opportunities for app developers and entrepreneurs in the agriculture sector.
- **Energy Efficiency and renewable Energy** – cost savings and demand for sustainably produced goods are driving investment in renewable energy and energy efficiency the agriculture sectors
- **Conservation Agriculture** – there is potential to increase the uptake of conservation agriculture in grain production areas in South Africa, particularly outside the Western Cape. This is expected to create opportunities for manufacturers and distributors of no-till equipment.

According to Greencape<sup>114</sup>, the current barriers to investment in the South African Agriculture sector, include:

- relatively high labour costs;
- water insecurity;
- rising electricity costs;
- rural security concerns;
- the quality and availability of export-commodity seedlings; and
- uncertainty over land rights and fears of unconstitutional land expropriation.

<sup>111</sup> DRDLR, Agri-parks Presentation: DAMC Launch, 2015

<sup>112</sup> Disrupt Africa, Agrinnovating for Africa, 2018

<sup>113</sup> Greencape, Sustainable Agriculture, Market Intelligence Report, 2018

<sup>114</sup> Greencape, Sustainable Agriculture, Market Intelligence Report, 2018

*Low Carbon Climate Resilient Built Environment and Human Settlements*

This overview focuses on sustainability in the built environment, specifically the green buildings sector in South Africa, given that this is a potential priority area for private sector investment.

It is estimated that approximately 23% of GHGs stem from buildings and that it takes only 300 resource-efficient buildings to save enough water to meet the daily needs of 550,000 people each year.<sup>115</sup>

According to the Green Building Council of South Africa (GBCSA), 61% of all South African building project activity in 2018, will be green buildings compared to 41% during 2017. The GBCSA certifies buildings according to the Green Star rating system. These buildings are evaluated in detail for their resource efficiency, based on a wide range of sustainability indicators applicable to each development, from light and water fixtures, to paint and carpeting.<sup>116</sup>

The GBCSA, which focuses on green building certification and training, was founded in 2007. It is one of 75 members of the World Green Building Council, along with Australia, the United States and the United Kingdom. After a relatively slow start, the GBCSA has witnessed and experienced exponential growth in terms of certification services. According to the Chairman of the GBCSA, “It took [the GBCSA] six years to certify its first 100 buildings and just two years to certify the next 200.”

In 2015, the South African Local Government Association (SALGA) entered into a Memorandum of Understanding with the GBCSA committing to work together to promote the greening of the public built environment; developing the capacity of municipal leaders and officials; and supporting local authorities to green their portfolio of public buildings.

The Department of Public Works (DPW) govern the regulatory framework for the building industry in South Africa, while the National Department of Human Settlements (NDHS) plays an oversight role with respect to the South Africa’s social housing planning process.

The National Building Regulations and Building Standards Act, Act 103 of 1977 (NBRBS Act), provides the basis for how buildings in South Africa should be constructed and developed to suit human habitation. The new National Building Regulations (NBR) were introduced in 2008.

The National Regulator for Compulsory Specification (NRCS) supports the policy setting framework for the building industry. The National Building Regulations Division of the NRCS is responsible for:

- ensuring a uniform understanding and implementation of the building regulations and building standards in accordance with the NBRBS Act; and
- advising Government departments on possible amendments and changes to building legislation.

The South African Bureau of Standards (SABS) is responsible for developing standards for the building industry in line with the regulations. In 2011, the SABS introduced the South African National Standard 10400 (SANS 10400), which sets out prescriptive provisions that are deemed to satisfy the technical aspects of the new NBR, including:

- Part X of the SANS 10400, which deals with environmental sustainability, and
- Part XA, which deals with energy use in buildings.

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<sup>115</sup> GBCSA, <https://gbcса.org.za/sas-green-building-sector-continues-to-grow/>

<sup>116</sup> GBCSA, <https://gbcса.org.za/sas-green-building-sector-continues-to-grow/>

The South African Government adopted a National Framework for Green Building in South Africa (NFGBSA) in November 2011, as its official policy on green building (DPW, 2013). Public sector departments are encouraged to adopt policies that require recognition of Green Star SA certification, when procuring public building space for leasing.

Other relevant social housing policies include:

- **“Breaking New Ground”** - a comprehensive plan for the development of sustainable human settlements, based on promoting densification and integration of urban areas through enhanced regulatory mechanisms, planning functions and financial incentives.
- **Social Housing Policy for South Africa** - provides an overview of the national housing programmes for the development of social housing in South Africa
- **National Housing Code** - outlines the national norms and standards for the construction of standalone residential dwellings, built through one of the National Housing Programmes.

The Green Building market is dominated by investments by the commercial property sector into the green building sector. Initially these investments were driven by Corporate Social Investment (CSI) considerations, as well as the perceived economic benefits associated with sustainable business practices. However, the financial benefits (i.e. lower operating costs, higher asset returns, increased capital appreciation, and improved marketability) derived from buying greener building material and/or applying alternative building technologies (ABT), are key drivers of current and future investments into the sector.

Greencape<sup>117</sup> also highlights the scope for growth in the low-income rental housing market, particularly in Cape Town, Eden and the Winelands, where demand is high and household income levels suggests a level of affordability. This represents opportunities for the private sector to partner with the public sector to incorporate sustainable green building technologies (renewable energy, energy efficiency, water harvesting and recycling, use of sustainable building materials, etc) into new developments.

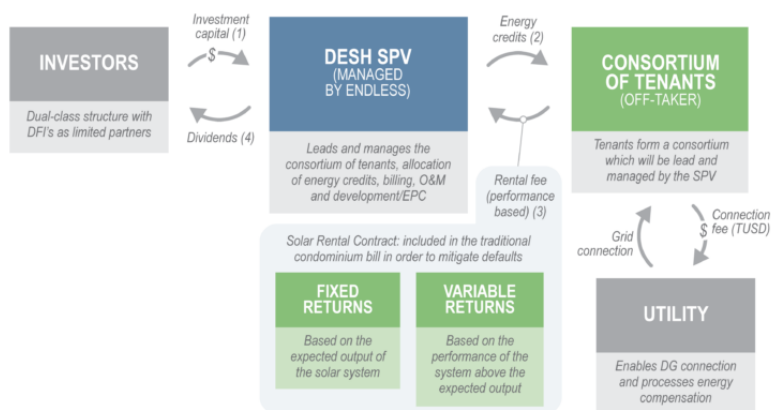
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<sup>117</sup> Greencape, Market Intelligence Report, Greening South African Buildings, 2014

Clean Energy

**Distributed Energy for Social Housing:** “Distributed Energy for Social Housing aims to enable distributed solar energy for low-income tenants in Brazil who cannot make the investments or don’t have access to credit, by providing a robust legal and financial structure to make it an attractive and low-risk investment option.”

Proposed structure:

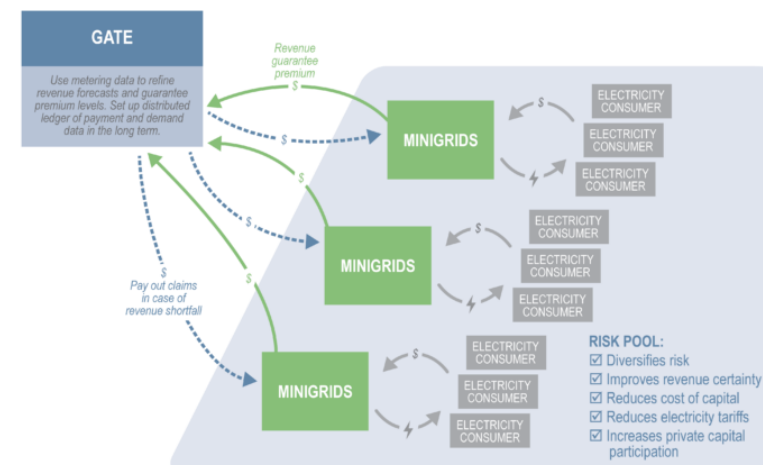


Key features:

- Third-party ownership and rental structure – tenants will only pay a monthly rental fee that is 10-20% lower than their standard utility rate and will bear no procurement or operations & maintenance costs.
- Defaulting clients will have their supply interrupted promptly, limiting potential losses for end-investors.
- Pilot phase planned in São Paulo (1.3m households) to test and understand the potential impact of the business model.

**Green Aggregation Tech Enterprise (GATE)** “Addresses demand risk and payment risk in mini-grids by providing guarantees over a baseline level of revenues, thereby improving revenue certainty and the credit quality of mini-grids.”

Proposed structure:



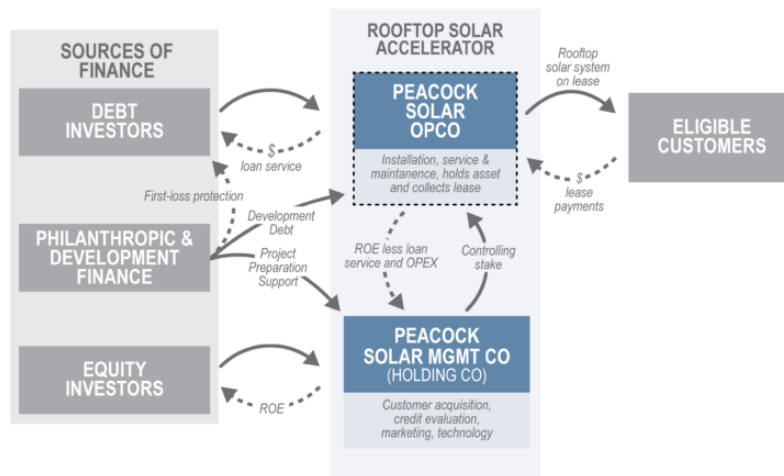
Key features:

- Mini-grid demand and payment risks are aggregated or pooled
- Revenue shortfalls are topped-up (guaranteed), thereby improving ‘predictability’ of cashflows and reducing payment default risk.
- Mini-grid owner pays a guarantee premium to GATE.
- Business model addresses mini grids spread across wide geographic locations by virtual aggregation/pooling. Metering and payment data are used to forecast a baseline level of revenue for guarantee.
- Public/concessional capital will be used for high-risk tranches, while lower risk tranches will leverage commercial finance.



**The Residential Rooftop Solar Accelerator** “The Residential Rooftop Solar Accelerator aims to accelerate mass adoption of residential rooftop solar to power 200 million households in India, through standardized product offering, easy financing, and efficient execution at scale.”

Proposed structure:



Key features

- Use data analytics to identify and target the appropriate market segments.
- Offer a monthly lease model to address high upfront costs for customers.
- Standardized product offering to achieve operational efficiencies.
- Operating model - The Management Co is responsible for customer acquisition, assessing credit worthiness, marketing the company’s services, and deploying R&D. The OpCo will be responsible for installation, servicing and maintenance of the systems. The OpCo will hold rooftop solar assets on its balance sheet, and will collect lease payments from customers.

Sustainable Land Use

**The Harvest Contract Vehicle (HCV) for Smallholder Tree Financing** “The Harvest Contract Vehicle seeks to scale up smallholder forestry in Africa to address climate change, wood supply shortages, and poverty, through an innovative mechanism that allows investors to buy portfolios of trees.”

Proposed structure:

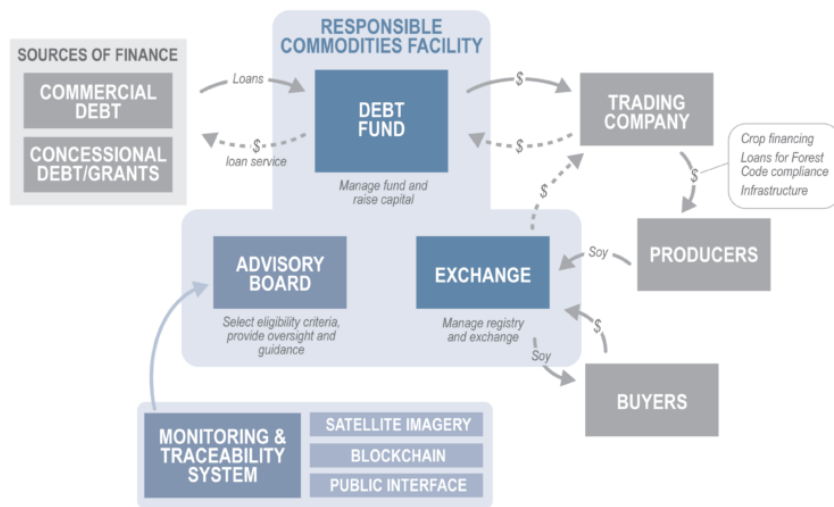


Key features:

- Partnership between HVC and smallholder forestry company to provide critical inputs and training to farmers to plant trees on unused, typically degraded land.
- The HVC packages a portfolio of tree contracts, creating an investment vehicle suitable to long term investors.
- The forestry company is responsible for harvesting the trees and providing the necessary market linkages.
- Smallholder farmers build wealth and climate resilience by maintaining the tree assets and receiving payments for thinning and harvesting.

**The Responsible Commodities Facility** “The Responsible Commodities Facility (RCF) aims to provide financial incentives for the production of soy in existing cleared and degraded lands, thus discouraging further expansion of agricultural land into the Brazilian Cerrado.”

Proposed structure

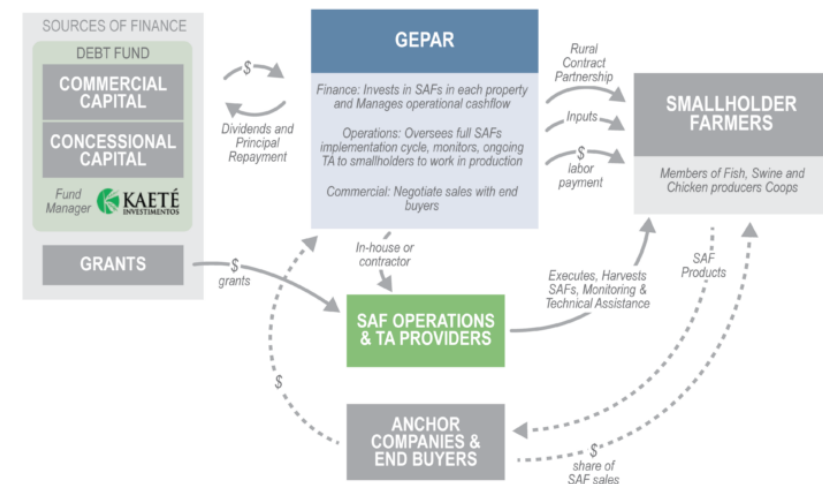


Key features:

- RCF will provide soy producers with financial (fund raising) and commercial (facilitate trading) incentives to redirect production into existing cleared and degraded lands, avoiding further deforestation in the Cerrado biome.
- RCF will facilitate the sale of soy through a dedicated exchange, linked to a blockchain registry to allow for monitoring and traceability of the products and guaranteeing compliance.
- The RCF provide soy producers with long-term loans (source: commercial and concessionary) and technical support, with soy serving as collateral.

**The Socio-Climate Benefits Fund Facility** “The Socio-Climate Benefits Fund (SCBF) will raise funds from donors and patient capital investors to implement agroforestry systems in smallholders’ lands in the Amazon, will provide training for their participation in the maintenance and harvest of the crops in their lands and access to markets, and will support Brazilian Forest Code compliance and Brazil’s 2030 forest restoration goals.”

Proposed structure:



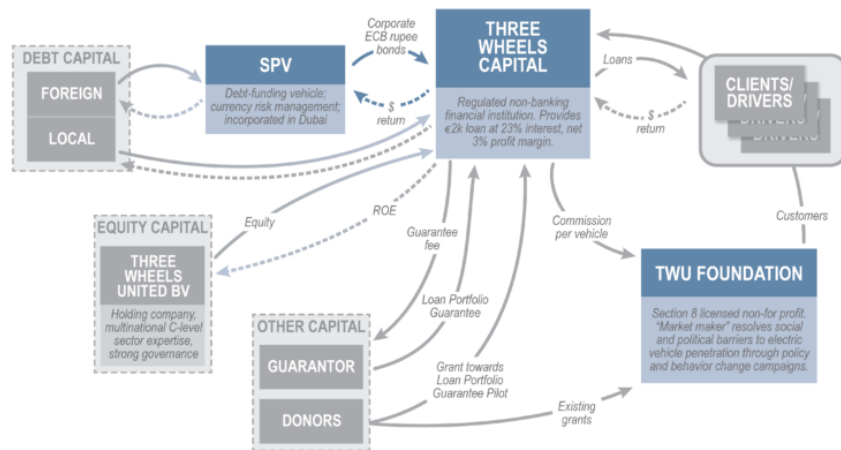
Key features:

- SCBF sets-up an investment fund or SPV (GEPAR) with different classes of investors. GEPAR will own and be responsible for the long-term sustainable agroforestry investments and crops made in smallholders’ lands.
- GEPAR also plays the role of ‘aggregator’, facilitating the sale of crops to buyers. Proceeds are used to pay smallholder farmers for labour and for leasing their land to GEPAR. The balance is used to repay capital providers.

Low-Carbon Transit

**Financing for Low-Carbon Auto Rickshaws:** “Financing for Low-Carbon Auto-Rickshaws provides loans to drivers, to enable ownership of electric auto-rickshaws. This will lower carbon emissions in Indian cities and enhance the livelihoods of drivers.”

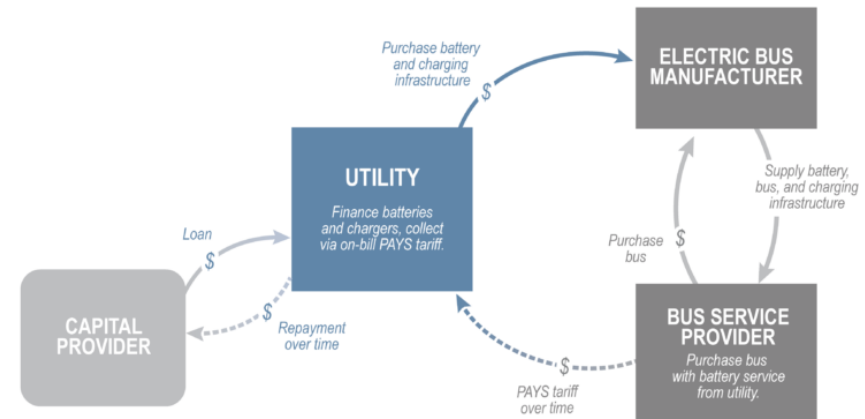
Proposed structure:



Key features:

- Addresses barriers such as the poor credit profiles of auto-rickshaw drivers, and high investment and/or collateral requirements
- Low cost finance - competitive rates of interest.
- Long tenor for repayments – option for no down payment.
- Economic inclusion – auto rickshaw ownership transfer within four years.
- Community-based collection system that uses the elements of behavioural sciences.

**Pay-As-You-Save for Clean Transport** “PAYS® for Clean Transport aims to accelerate clean transit adoption in cities by lowering the upfront costs of electric buses with a utility service agreement for the batteries and charging stations. This provides the customer with a path to ownership of the assets while also assuring the utility accelerated electricity sales and full cost recovery.”

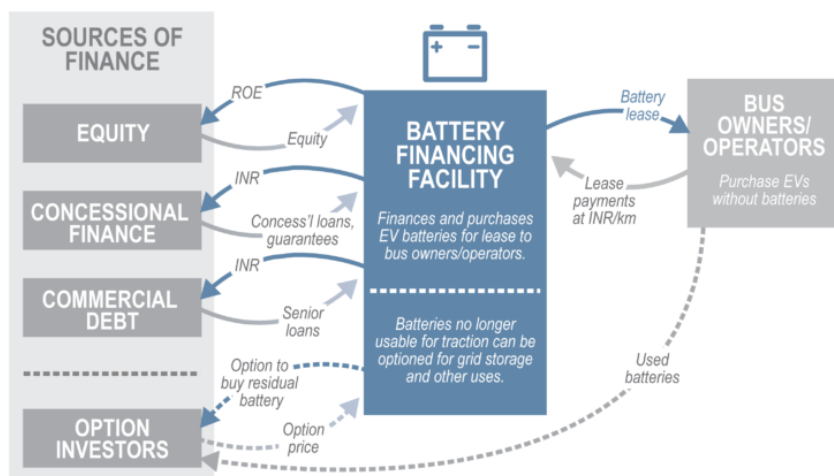


Key features:

- Bus service providers are able to buy the electric buses, excluding the batteries and charging infrastructure, resulting in reduced upfront costs that are similar to the cost of fossil fuel buses.
- Bus service providers enjoy operating cost savings from day one.
- Utilities obtain capital to finance the investment in battery and charging infrastructure and recover investment + return from bus service providers via regular billing (based on an opt-in tariff).
- The capital providers are able to fund lower risk borrowers (Utilities) resulting in acceptable risk-return parameters.

**The Long-Term Debt Facility for Traction Batteries** “The Long-Term Debt Facility for Traction Batteries is a battery financing mechanism which will reduce the upfront cost of electric buses by 30-40%, by separating the cost of the battery from the cost of ownership of an electric bus, and providing the battery on an operating expenditure basis.”

Proposed structure:



Key features:

- Bus owners or operators purchase EV buses without batteries, reducing upfront costs.

- Battery Finance Facility (BFF) obtains finance (Equity and Debt and concessional debt for initial phase) to fund the purchase of batteries, which are leased to bus owners or operators.
- BFF also takes care of disposal of post-traction batteries and targets utility companies for grid storage of electricity, battery cell manufacturers, battery OEMs and recycling companies who has option to buy batteries.

Further details of the nine short-listed climate finance vehicles being incubated by The Lab can be accessed via the respective links above.<sup>118</sup>

<sup>118</sup> All the infographics included in this annexure are unaltered and obtained directly from the Lab’s website (<https://www.climatefinancelab.org>). The Lab welcomes the use of its material for non-

commercial purposes, such as policy discussions or educational activities, under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

The table below summarises the initial eight near-term Priority Flagship Programmes (2011) and Sub-programmes under development by the South African Government.

Flagship Programme	Description	Sub-programmes
Climate Change Response Public Works	Consolidate and expand the Expanded Public Works Programme and its sector components. These sector components include the Non-State Sector's Community Works Programme and the suite of Environment and Culture Sector programmes.	<ul style="list-style-type: none"> <li>Working for Water</li> <li>Working for Wetlands</li> <li>Working for Land</li> <li>Working on Fire</li> <li>Working for Energy</li> <li>Working for Ecosystems</li> <li>People and Parks</li> <li>Greening and Open Space Management</li> <li>Working on Waste</li> <li>Working for the Coast</li> <li>Working for Fisheries</li> <li>Comprehensive Agricultural Support Programme</li> <li>Land use (Conservation agriculture, Soilcare, Veldcare, Watercare)</li> </ul>
Water Conservation and Water Demand Management (WCWDM)	Accelerate implementation of the National Water Conservation and Water Demand Management Strategy in the industry, mining, power generation, agriculture, and water services sectors. It also includes the provision of rainwater harvesting tanks in rural and low-income settlements.	<ul style="list-style-type: none"> <li>The Water Conservation and Development and implementation of WCWDM strategies</li> <li>War on Leaks Project</li> <li>The Accelerated Community Infrastructure Programme</li> <li>The National Rainwater Harvesting Programme</li> <li>WC/WDM target setting for metropolitan municipalities</li> <li>The No Drop Assessment and Certification Programme</li> </ul>
Renewable Energy	Scale-up the deployment of renewable energy technologies, based on the country's 2010 Integrated Resource Plan (IRP)	<ul style="list-style-type: none"> <li>Renewable Energy Independent Power Producer Procurement Programme</li> <li>National Solar Water Heating Programme</li> <li>Eskom renewable energy projects (100MW Solar PV, 100MW wind project and Ingula Scheme pumped storage hydro projects)</li> <li>Off-grid household electrification</li> <li>Green industries development (local manufacturing RE manufacturing and building regulations for RE)</li> <li>Green Accord (Green economy renewable energy investments, Reduction of fossil-fuel open fire cooking and heating, promotion of localisation, youth employment, cooperatives and skills development, renewable energy sector financing)</li> <li>Strategic environmental assessment for RE resources and RE development zones</li> </ul>
EE and Energy Demand Management	Develop and facilitate an energy efficiency programme in the industrial and residential sectors.	<ul style="list-style-type: none"> <li>Integrated Demand Management Programme</li> <li>Industrial Energy Efficiency (Energy efficiency incentives 12 L; Green Energy Efficiency Fund (IDC))</li> <li>Residential Energy Efficiency Programme (National Housing Codes - environmentally efficient housing)</li> <li>Government Building Energy Efficiency Programme (Municipal energy efficiency &amp; demand management, National framework for green buildings &amp; green building construction standards)</li> </ul>

Flagship Programme	Description	Sub-programmes
		<ul style="list-style-type: none"> <li>Energy Efficiency Labelling Standards Building energy performance labelling</li> <li>Biofuels Industrial Strategy &amp; Biofuels Mandatory Blending Regulations</li> </ul>
Transport	Develop an enhanced public transport programme to promote lower-carbon mobility in five metropolitans and ten cities. An Energy Efficient Vehicles Programme will also be created to improve the average efficiency of South Africa's vehicles by 2020.	<ul style="list-style-type: none"> <li>Integrated Rapid Public Transport Networks (Rapid bus transport in 13 cities)</li> <li>Non-Motorised Transport Networks</li> <li>Promote Fuel Efficiency Measures</li> <li>Transport Modal Shifts (road to rail for passenger and freight, Gautrain)</li> <li>Taxi Recapitalisation Programme</li> <li>Integrated Urban Planning and Transportation Planning</li> </ul>
Waste Management	Use the information of the mitigation potential analysis for this sector to identify key working areas, such as waste to energy. A pilot project is planned and will be implemented, showcasing that waste to energy reduces GHG emissions and serves as a source of energy for a municipality.	<ul style="list-style-type: none"> <li>Solid Waste Management (Diversion of waste from landfills and Landfill gas-to-energy projects)</li> <li>Municipal Wastewater Management (Biogas combined heat and power in wastewater treatment facilities)</li> </ul>
Carbon Capture and Sequestration	Develop a Carbon Capture and Sequestration Demonstration Plant to store the process emissions from an existing high carbon emissions facility.	<ul style="list-style-type: none"> <li>National CCS Roadmap Development, Implementation and Oversight</li> <li>Pilot CO<sub>2</sub> Storage Project &amp; Pilot CO<sub>2</sub> Capture Project</li> </ul>
Adaptation Research	Design and roll-out a national and regional research programme to scope sectoral adaptation requirements, strategies and costs.	<ul style="list-style-type: none"> <li>Phase 1: Climate modelling, sector-based impacts and adaptation scoping</li> <li>Phase 2: Development of adaptation scenarios for future climate conditions</li> </ul>

Source: CCAR, 2016

Name and designation	Entity	Sector and subsector	Role or area of activity
<p>Tlou Ramaru (Chief Directorate - Climate Change Adaptation)</p> <p>Deborah Ramalope (Chief Directorate - Climate Change Mitigation)</p> <p>Reitumetse Molotsoane (Director: Climate Change Response Near-term Priority Flagship Programme)</p>	The Department of Environmental Affairs (DEA)	Environmental (cross - sectoral oversight)	<p>Climate Change Adaptation</p> <p>Climate Change Mitigation</p> <p>Near-term Climate Change Flagship Programmes</p> <p>Climate Finance</p>
<p>Olympus Manthata (Head of Climate Finance)</p> <p>Mohamed Sayed (Specialist, Climate Finance Unit)</p>	Development Bank of Southern Africa (DBSA)	<p>Energy</p> <p>Energy Efficiency</p> <p>Water/Waste</p> <p>Other Infrastructure</p>	<p>Green Fund</p> <p>Small Scale Renewables Debt Fund</p> <p>Climate Finance Facility - GCF Proposal</p> <p>Credit enhancement debt fund - GCF proposal</p>
Anthony Costa (Investment Programme Lead)	<ul style="list-style-type: none"> <li>Industrial Development Corporation (IDC)</li> </ul>	<p>Industrial sector</p> <p>Manufacturing (Infrastructure/ Equipment)</p> <p>Energy</p>	Presidential Investment Mobilisation Programme
Many Barnett (Director)	<ul style="list-style-type: none"> <li>South African National Biodiversity Institute (SANBI)</li> </ul>	Biodiversity	<p>Adaptation/Biodiversity</p> <p>Small Grant Facility (Adaptation Fund and Global Environmental Facility)</p> <p>Accredited Entity - Green Climate Fund</p>
Gary Kendall (Strategy & Sustainability specialist)	<ul style="list-style-type: none"> <li>Nedbank Group</li> </ul>	Banking	Business sustainability
Jon Duncan (Head of Sustainability Research and Engagement)	<ul style="list-style-type: none"> <li>Old Mutual Investment Group</li> </ul>	Institutional Investments	<p>Business sustainability</p> <p>Responsible Investment</p>
Tine Fisker Henriksen (Senior Project Manager, Innovative Finance)	<ul style="list-style-type: none"> <li>Bertha Centre for Social Innovation, Graduate School of Business, University of Cape Town</li> </ul>	Academic/Research	<p>Social Innovation</p> <p>Innovative Finance</p> <p>Green Outcomes Based Fund</p>
Steve Nicholls (Head of Environmental Sustainability)	<ul style="list-style-type: none"> <li>National Business Initiative (NBI)</li> </ul>	Private Sector business Association (cross-sectoral)	<p>Private Sector sustainability</p> <p>Energy Efficiency</p> <p>Carbon Disclosure Project</p> <p>Water security</p>
Manfred Braune (Chief Technical Officer)	<ul style="list-style-type: none"> <li>Green Building Council of South Africa (GBCSA)</li> </ul>	Green Buildings	EE in Green Public Infrastructure and Buildings Programme (EPIBP)

<b>ABT</b>	Alternative Building Technologies
<b>AE</b>	Accredited Entity
<b>AF</b>	Adaptation Fund
<b>AFOLU</b>	Agriculture, Forestry and Other Land Use
<b>AMEU</b>	Association of Municipal Electricity Utilities
<b>BAU</b>	Business as Usual
<b>BEE</b>	Black Economic Empowerment
<b>BFF</b>	Battery Finance Facility
<b>BMUB</b>	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
<b>bn</b>	Billion
<b>BOOT</b>	Build Operate Own and Transfer
<b>BOT</b>	Build Operate Transfer
<b>BUR</b>	Biennial Update Report
<b>CAGR</b>	Compound Annual Growth Rate
<b>CBI</b>	Climate Bond Initiative
<b>CCAR</b>	Climate Change Report
<b>CCFPSC</b>	Climate Change Flagship Programme Steering Committee
<b>CDM</b>	Clean Development Mechanism
<b>CDP</b>	Carbon Disclosure Project
<b>CEA</b>	Controlled Environment Agriculture
<b>CFCM</b>	Climate Finance Co-ordination Mechanism
<b>CFF</b>	Climate Finance Facility
<b>CMA</b>	Catchment Management Agencies
<b>COP</b>	Conference of The Parties
<b>CPT</b>	Cape Town
<b>CSA</b>	Climate Smart Agriculture
<b>CSI</b>	Corporate Social Investment
<b>CSP</b>	Climate Support Programme
<b>CTF</b>	Clean Technology Fund
<b>DAFF</b>	Department of Agriculture, Forestry and Fisheries
<b>DBSA</b>	Development Bank of Southern Africa
<b>DEA</b>	National Department of Environmental Affairs
<b>DED</b>	Department of Economic Development
<b>DERO</b>	Desired Emissions Reduction Outcomes
<b>DFI</b>	Development Finance Institution
<b>DHS</b>	Department of Human Settlements
<b>DLRRD</b>	Department of Land Reform and Rural Development



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<b>DMR</b>	Department of Mineral Resources
<b>DMW</b>	Diversion of Municipal Waste
<b>DoE</b>	Department of Energy
<b>DoT</b>	Department of Transport
<b>DPE</b>	Department Public Enterprises
<b>dti</b>	Department of Trade and Industry
<b>DWS</b>	Department of Water and Sanitation
<b>ebA</b>	Ecosystem Based Approaches
<b>EDD</b>	Economic Development Department
<b>EDD</b>	Economic Development Department
<b>EE</b>	Energy Efficiency
<b>EPC</b>	Engineering Procurement and Construction
<b>ESCO</b>	Energy Services Company
<b>FAO</b>	The Food and Agriculture Organization of The United Nations
<b>GBCSA</b>	Green Building Council of South Africa
<b>GCF</b>	Green Climate Fund
<b>GDP</b>	Gros Domestic Product
<b>GEF</b>	Global Environment Facility
<b>GHG</b>	Greenhouse Gas
<b>GIZ</b>	The Deutsche Gesellschaft Für Internationale Zusammenarbeit GmbH
<b>GOF</b>	Green Outcomes-based Fund
<b>HCV</b>	Harvest Contract Vehicle
<b>IAP</b>	Integrated Approach Pilot
<b>ICT</b>	Information, Communication and Technology
<b>IDC</b>	Industrial Development Corporation
<b>IDM</b>	Integrated Demand-Side Management
<b>Imbewu</b>	Imbewu Sustainability Legal Specialists (Pty) Ltd
<b>INDC</b>	Intended Nationally Determined Contributions
<b>IPAP</b>	Industrial Policy Action Plan
<b>IRP</b>	Integrated Resource Plan
<b>IRR</b>	Internal Rate of Return
<b>JHB</b>	Johannesburg
<b>JSE</b>	Johannesburg Securities Exchange
<b>KfW</b>	German Development Bank
<b>kWh</b>	Kilowatt Hour
<b>LoI</b>	Letter of Intent
<b>LTAS</b>	Long Term Adaptation Scenarios

<b>m</b>	Million
<b>MDB</b>	Multilateral Development Bank
<b>MFMA</b>	Municipal Finance Management Act
<b>MTSF</b>	Medium Term Strategic Framework
<b>NAMA</b>	Nationally Appropriate Mitigation Actions
<b>NAS</b>	National Adaptation Strategy
<b>NATMAP</b>	National Transport Master Plan
<b>NBI</b>	National Business Initiative
<b>NBR</b>	National Business Regulations
<b>NBRBS</b>	National Business Regulations and Building Standards
<b>NCCRP</b>	National Climate Change Response Policy
<b>NCCRS</b>	National Climate Change Response
<b>NCCRWP</b>	National Climate Change Response White Paper
<b>NDA</b>	National Designated Authority
<b>NDC</b>	Nationally Determined Contributions
<b>NDME</b>	National Disaster Management Centre
<b>NDP</b>	National Development Plan 2030
<b>NEES</b>	National Energy Efficiency Strategy
<b>NERSA</b>	National Energy Regulator of South Africa
<b>NFCS-SA</b>	The National Framework for Climate Services South Africa
<b>NGHGIS</b>	National Greenhouse Gas Information System
<b>NGP</b>	New Growth Path
<b>NIBS</b>	National Industrial Biofuels Strategy
<b>NIE</b>	National Implementing Entity
<b>NIPS</b>	National Industrial Policy Framework
<b>NRCS</b>	National Regulator for Compulsory Specification
<b>NRW</b>	Non-Revenue Water
<b>NSSD1</b>	National Strategy for Sustainable Development and Action Plan
<b>NT</b>	National Treasury
<b>OECD</b>	The Organisation for Economic Co-operation and Development
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PEE</b>	Public Environmental Expenditure
<b>PEER</b>	Public Environmental Expenditure Review
<b>PICC</b>	Presidential Infrastructure Co-ordination Commission
<b>PSC</b>	Programme Steering Committee
<b>PSF</b>	Private Sector Facility
<b>PV</b>	Photo Voltaic
<b>REIPPPP</b>	Renewable Energy Independent Power Producers Procurement Programme

<b>R</b>	Rands
<b>RF</b>	Recipient Fund
<b>RFP</b>	Request for Proposal
<b>SABS</b>	South African Bureau of Standards
<b>SACFP</b>	Southern African Climate Finance Partnership
<b>SALGA</b>	South African Local Government Association
<b>SANS</b>	South African National Standards
<b>SAWS</b>	South African Weather Services
<b>SCBF</b>	Socio-Climate Benefits Fund
<b>SCCF</b>	Special Climate Change Fund
<b>SDC</b>	Swiss Agency for Development Cooperation
<b>SDG</b>	Sustainable Development Goals
<b>SEFA</b>	Small Enterprise Finance Agency
<b>SET</b>	Sector Emissions Targets
<b>SEZ</b>	Special Economic Zones
<b>SGB</b>	Small and Growing Businesses
<b>SIP</b>	Strategic Integrated Project
<b>SME</b>	Small and Medium Enterprises
<b>SMME</b>	Small Medium and Micro-Enterprises
<b>SONA</b>	State of The Nation Address
<b>SPV</b>	Special Purpose Vehicle
<b>SSN</b>	SouthSouthNorth
<b>TCTA</b>	Trans Caledon Tunnel Authority
<b>The Lab</b>	The Climate Finance Lab
<b>TIPS</b>	Trade and Industrial Policies Strategies
<b>UK</b>	United Kingdom
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>USAID</b>	United States Agency for International Development
<b>USD</b>	United States Dollars
<b>WCWDM</b>	Water Conservation and Water Demand Management
<b>WCWDM</b>	Water Conservation and Water Demand Management
<b>WEF</b>	World Economic Forum
<b>WL</b>	Water Loss
<b>WRC</b>	Water Research Commission
<b>WSA</b>	Water Services Agencies
<b>WUA</b>	Water Users Associations
<b>ZAR</b>	South African Rand