South Africa's 1st Annual Climate Change Report

Near-Term Priority Climate Change Flagship Programmes

Theme H

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

IMPRINT

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The seven Themes of this Report are:

- **Theme A:** A Synopsis of South Africa's 2015 Annual Report on Monitoring Climate Change Responses
- **Theme B:** South Africa's Climate Change Monitoring and Evaluation System
- **Theme C:** Climate Change Trends, Risks, Impacts and Vulnerabilities
- **Theme D:** Tracking South Africa's Transition to a Lower Carbon Economy
- **Theme E:** Monitoring the Adaptation Landscape in South Africa: *Desired Adaptation Outcomes, Adaptation Projects and the Intended Nationally Determined Contribution*
- **Theme F:** Climate Finance
- **Theme G:** Climate Change Adaptation Governance and Management
- **Theme H:** Near-Term Priority Climate Change Flagship Programmes
- **Theme I:** Key Outcomes of COP 21

Published in South Africa - August 2016

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FOREWORD BY MS. EDNA MOLEWA

MINISTER OF THE DEPARTMENT OF ENVIRONMENTAL AFFAIRS

Climate change is one of the greatest challenges of our time. As part of the global community, we know we shoulder an immense responsibility to deal with climate change and its impacts. The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts. That said - we do indeed have the means to limit climate change and build a more prosperous, sustainable future for our country and world, and all who live in it.

South Africa has endorsed the National Climate Change Response Policy as a vision and a framework for an effective climate change response, and the long-term, just transition to a climate-resilient economy and society. The policy is the product of an extensive consultation process. It sets two high-level objectives:

- ***Firstly***, to effectively manage the inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity; and
- ***Secondly***, to make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

South Africa's approach towards an effective climate change response is both developmental and transformational. It is developmental in that we are prioritising climate change responses that have significant mitigation or adaptation benefits, AND have significant economic growth, job creation, public health, risk management and poverty alleviation benefits. It is transformational in that we are seeking to address climate change at a scale of economy that supports the required innovation and finance flows needed for a transition to a lower carbon, efficient, job creating, equitable and competitive economy. In essence, it is about sustainable development.

Work is well advanced in implementing this National Climate Change Response Policy. One of the key elements of the climate change response is a country-wide monitoring and evaluation system that tracks South Africa's transition to a lower carbon and climate resilient economy and society.

The main output of the climate change monitoring and evaluation system is South Africa's annual climate change report. This year, the Department will publish its first annual climate change report. This report focusses on (i) quantifying and profiling the impact of ongoing or recently completed mitigation actions (ii) updating the information on climate finance that was reported in South Africa's

first Biennial Update Report (iii) providing latest available information on climate change risks together with describing ongoing adaptation projects (iv) presenting progress in establishing a credible tracking system for key climate change actions in the country (v) updating the roadmap on climate change flagship programmes (vi) recognising and profiling climate change actions that have been taken by the local government sphere of government and (vii) setting out key outcomes of the 21st Conference of Parties (COP 21) which took place in Paris in December 2015.

Internationally, South Africa submitted its own Intended Nationally Determined Contribution (INDC) to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat in September 2015. Our INDC encompasses three distinct components namely mitigation, adaptation and the means of implementation. The main aim of the next annual report (2016/17) is to initiate an in-depth annual process of reporting progress against South Africa's INDC.

Lastly, there is vast potential for co-operation in producing these annual reports. We recognise and thank all those that have assisted us to produce the first report. For this report, we received contributions from all three spheres of government, the private sector, civil society, foreign embassies, and academia. In addition, I would like to thank the German government for the extensive support that we have received through GIZ. We invite many others to continue the collaboration with us as we contribute towards the identification of opportunities for further climate change actions and management of current and future climate risks with the view to consolidating the gains that this country has attained so far by improving peoples' livelihoods, conserving biodiversity, and improving human well-being. We believe that by working together; we can save our tomorrow today.

Thank you

MS. EDNA MOLEWA

Minister of the Department of Environmental Affairs

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LIST OF ABBREVIATIONS

AFOLU	agriculture, forestry and other land use
BMUB	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BRT	bus rapid transport
CC	climate change
CDM	Clean Development Mechanism
CERs	Certified Emission Reductions
CCS	carbon capture and sequestration
CMA	Catchment Management Agency
COP	Conference of the Parties
CSLF	Carbon Sequestration Leadership Forum
CSP	concentrated solar power
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DOE	Department of Energy
DMR	Department of Mineral Resources
DNA	Designated National Authority
DPW	Department of Public Works
DRDLR	Department of Rural Development
DST	Department of Science and Technology
dti	Department of Trade and Industry
	and Land Reform
DWS	Department of Water and Sanitation
EE	energy efficiency
EEEDM	Energy Efficiency and Energy Demand Management Flagship Programme
EEPBP	Energy Efficiency in Public Buildings Programme
EPWP	Expanded Public Works Programme
ESCO	energy savings company
GHG	greenhouse gas
GIZ	Gesellschaft für Internationale Zusammenarbeit
GWh	gigawatt-hours
IDC	Industrial Development Corporation
IGCCC	Inter-Governmental Committee on Climate Change
IKI	International Climate Initiative
IMCCC	Inter-Ministerial Committee on Climate Change
INDC	intended nationally determined contribution
IPAP	Industrial Policy Action Plan
IPCC	Intergovernmental Panel on Climate Change
IPP	independent power producer
IPPU	industrial processes and product use
IRPTN	integrated rapid public transport networks
ISO/SANS	International Organisation for Standardisation / South African National Standard
IWA	International Water Association
IWMP	industry waste management plans
KPI	key performance indicator
LFG	landfill gas
LTAS	Long Term Adaptation Scenarios
M&E	monitoring and evaluation
M&V	measurement and verification
MDS	Market Demand Strategy

MRV	measurement, reporting and verification
MTSF	Medium-term Strategic Framework
MWh	megawatt-hours
MWTP	municipal wastewater treatment systems
NAMA	nationally appropriate mitigation action
NCCC	National Committee on Climate Change
NCCRP	National Climate Change Response Policy
NIP	National Infrastructure Plan
NDP	National Development Plan 2030
NEES	National Energy Efficiency Strategy
NMT	non-motorised transport
PCSP	Pilot CO_2 Storage Project
PICC	Presidential Infrastructure Coordinating Commission
PRASA	Passenger Rail Agency of South Africa
PV	photovoltaic
RE	Renewable Energy Flagship Programme
REDZ	Renewable Energy Development Zones
REIPP	renewable energy independent power producer
REI4P	Renewable Energy Independent Power Producer Procurement Programme
REFIT	renewable energy feed-in-tariffs
RWH	rainwater harvesting
SACCCS	South African Centre for Carbon Capture and Storage
SANEDI	South African National Energy Development Institute
SEA	strategic environmental assessment
SFRA	stream flow reduction activity
SHS	solar home system
S-INDC	support component of South Africa's INDC
SIP	Strategic Integrated Project
SWH	solar water heater
TWG	Technical work group
TWh	terawatt-hours
UNFCCC	United Nations Framework Convention on Climate Change
V-NAMA	Vertically Integrated Nationally Appropriate Mitigation Actions
WASA	Wind Atlas for South Africa
WARMS	Water Authorisation and Registration Management System
WCWDM	water conservation and water demand management
WELS	water efficiency labelling and standards
WSA	water services authority
WtE	waste-to-energy
WUE	water use efficiency

1. INTRODUCTION

1.1 Framing the Challenge

Climate change poses significant social, economic and environmental risks and challenges, on an unparalleled scale, to developed and developing countries alike. Simultaneously curbing climate change and responding to the unavoidable impacts of historic greenhouse gas (GHG) emissions timeously, requires "substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change risks".[1]

The opportunities to implement high ambition and high impact climate change response measures that will realise considerable mitigation, adaptation and broader socio-economic benefits pre-2020 are immense. A range of well-established policies, measures and actions is available, that can be replicated and scaled immediately to accelerate pre-2020 climate action and that will lay the foundation for a prosperous and leading, resilient and low carbon economy and society beyond 2020.

South Africa already has a well-developed base for mitigating climate change and building climate resilience. *The National Climate Change Response White Paper* (NCCRP), approved by Cabinet in October 2011, identifies a set of Near-term Priority Flagship Programmes that are frontrunners or 'game-changers' in South Africa's climate action in key sectors. These Climate Change Flagship Programmes, by and large, respond to the challenges identified above. However, the current level and speed of action is insufficient to mitigate national GHG emissions and enhance climate change resilience on the scale required.

Key Messages

- Urgent and appropriate climate action offers South Africa a clear pathway towards a more prosperous, inclusive, equitable and secure future.
- South Africa already has a well-developed base for mitigating climate change and building climate resilience in the Near-term Priority Flagship Programmes.
- The Near-term Priority Flagship Programmes are the game-changers in South Africa's climate change response landscape.
- The required focus from now on is concrete mitigation and adaptation actions that are substantial, scalable and replicable.

1.2 Overview of the Near-Term Priority Flagship Programmes

The Near-term Priority Flagship Programmes are implementation programmes and represent the leading actions that have been committed to and that are underway, which are advancing South Africa's climate change response efforts.[2] The programmes include both the scaling up of existing climate change initiatives and new initiatives that are ready to come on stream by 2020.

1 IPCC, *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. [Core writing team, R.K. Pachauri and L.A. Meyer (eds.)]. (Geneva: IPCC, 2014), 56.

2 Republic of South Africa, *National Climate Change Response White Paper*. (Pretoria: Government Printer, 2011) 31–33.

1. Introduction

The Near-term Priority Flagship Programmes are described in detail in Section 8 of the NCCRP as:

1. The Climate Change Response Public Works Flagship Programme
2. The Water Conservation and Demand Management (WCWDM) Flagship Programme
3. The Renewable Energy (RE) Flagship Programme
4. The Energy Efficiency and Energy Demand Management (EEEDM) Flagship Programme
5. The Transport Flagship Programme
6. The Waste Management Flagship Programme
7. The Carbon Capture and Sequestration (CCS) Flagship Programme
8. The Adaptation Research Flagship Programme

These Near-term Priority Flagship Programmes focus on action. They have been implemented in recognition of the urgency of action and the level of ambition required in responding to climate change. They also take into account the need to build on the experience of key sectors in implementing policies and measures that are, in effect, climate change responses. They anchor, and potentially accelerate, the next phase of South Africa's transition to a lower carbon and climate resilient society and economy, providing the basis for more ambitious and far-reaching climate actions.

The Near-term Priority Flagship Programmes are strategic, large-scale measures of national significance. They incorporate actions which directly reduce greenhouse gas emissions or increase climate resilience. These are combined with a suite of regulatory measures, market-based instruments, tax incentives and fiscal subsidies, and information and awareness building initiatives. Ideally, they are led by the relevant national line department or departments (in cases where projects or groups of projects with climate change adaptation and/or climate change mitigation impact span multiple line departments).

The Near-term Priority Flagship Programmes provide the necessary infrastructure to enable climate action at scale. They provide a robust management infrastructure, and a suite of tested processes and policy measures coupled with the ability to deliver interventions which have systemic implications. These features make the Near-term Priority Flagship Programmes an attractive launch pad for the development of additional measures for South Africa to address climate change at the required scale, while attracting further resources and investment to support programme delivery.

Irrigated field

The Flagship Programmes can spur efforts to limit climate change and realise solutions to enhance South Africa's adaptive capacity and resilience. The social, economic and environmental benefits delivered through implementing the Flagship Programmes advance the overarching objectives of the *National Development Plan: Vision for 2030* (NDP), namely to: "eliminate poverty and reduce inequality by 2030 through uniting South Africans, unleashing the energies of its citizens, growing an inclusive economy, building capabilities, enhancing the capability of the state and leaders working together to solve complex problems", driven particularly by the Industrial Policy Action Plan (IPAP) and the New Growth Path.[3]

Key Messages

- Flagship programmes represent the low-hanging fruits that can potentially catalyse South Africa's long-term climate action.
- The social, economic and environment benefits delivered through Flagship Programme implementation advance the overarching objectives of the NDP.
- The Near-term Priority Flagship Programmes provide the necessary infrastructure to enable climate action at scale

1.3 Purpose of the Theme on Flagship Programmes

The primary purpose of this theme is to profile Near-term Priority Flagship Programmes, and to demonstrate and communicate the value and benefits of the Flagship Programmes approach to South Africa's climate change response.

As a step towards restoring the flagships to their rightful place in South Africa's climate change response, the theme on Flagship Programmes aims to achieve four objectives (**Figure 1**).

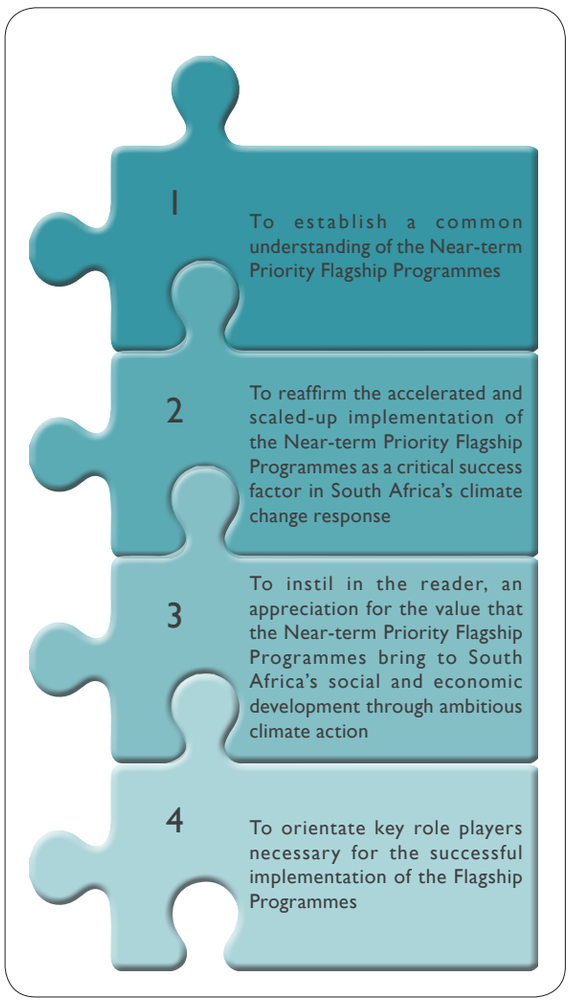


Figure 1: Overview of the objectives of the theme on Flagship Programmes

3 National Planning Commission. *National Development Plan: Vision for 2030*. (Pretoria: Government Printer, 2011) 1. http://www.gov.za/sites/www.gov.za/files/devplan_2.pdf (Accessed 5 January 2016)

1.4 Structure of the Theme on Flagship Programmes

The theme on the Near-term Priority Flagship Programmes is divided into five sections (**Table 1**), each focusing on a core set of issues.

Table 1: Overview structure and approach of the theme on Flagship Programmes

Section	Core issues
1. Introduction	• A high level overview of the key issues discussed • Structure and organisation of the theme
2. Positioning the Flagship Programmes going forward	• Elaborating on the NCCRP vision for Flagship Programmes • Linking the Flagship Programmes with the National Development Plan, South Africa's Intended Nationally Determined Contribution (INDC) to the UNFCCC, the National Infrastructure Plan's Strategic Integrated Projects and nationally appropriate mitigation actions
3. Unpacking the Near-term Priority Flagship Programmes	• Broad outline of individual Flagship Programmes • Key lessons learnt to date
4. Scaling up climate action	• Flagship Programmes criteria and priority areas • Building and operationalising Near-term Priority Flagship Programmes at scale by 2020 • Understanding key role players
5. Conclusion	• Flagship Programmes as integrators of South Africa's climate change response

2. POSITIONING THE NEAR-TERM PRIORITY FLAGSHIP PROGRAMMES

2.1 Overview

This section aims to clearly and firmly situate the Near-term Priority Flagship Programmes in South Africa's climate change response policy landscape and to understand the vision for these programmes and their contribution to the *National Development Plan: Vision for 2030*, to *South Africa's Intended Nationally Determined Contribution* (INDC) to the *United Nations Framework Convention on Climate Change* (UNFCCC) and their relation to nationally appropriate mitigation actions (NAMAs).[4]

The section begins by setting out what the programmes are meant to achieve and the policy drivers they respond to; and goes on to extracting and understanding the value of Flagship Programmes in the national response. This forms the basis for positioning the programmes into the future.

2.2 Locating the Near-Term Priority Flagship Programmes in South Africa's Climate Change Response: The National Climate Change Response Policy

The Near-term Priority Flagship Programmes stem from the NCCRP, which establishes the Flagship Programme approach as a fundamental component of the national climate change response. The NCCRP positions the Near-term Priority Flagship Programmes as the primary mechanism for reconciling and integrating South Africa's national social, economic and environmental development imperatives into a unitary and cohesive course of action.

The NCCRP describes the Near-term Priority Flagship Programmes as:

- an integral component of the NCCRP
- informed by the urgency of acting on mitigation and adaptation responses as soon as possible
- building on the work done by many sectors researching and implementing policies and measures that address the challenges of climate change
- forming the foundation for the next phase in the transition to a lower-carbon and climate-resilient economy and society
- programmes that will include both the scaling up of existing climate change initiatives and new initiatives that are ready to come on stream.

The strategic approach for the implementation of South Africa's climate change response policy rests on six pillars. These pillars are the basis for ensuring that the twin objectives of South Africa's climate change response are achieved, namely making a fair contribution to global efforts to mitigate climate change and effectively managing climate change impact, while maintaining or enhancing South Africa's economic competitiveness and social, economic and environmental resilience (**Figure 2**).

The NCCRP distinctly locates the Near-term Priority Flagship Programmes as the champion of the 'dynamic and evidence-based' aspect of national climate change policy. The programmes respond to the action focused aspect of the NCCRP and constitute the major climate change response immediately following the publication of the policy.

4 Republic of South Africa. *South Africa's Intended Nationally Determined Contribution (INDC)*. (Pretoria: Government Printer, 2015). https://www.environment.gov.za/sites/default/files/docs/sanational_determinedcontribution.pdf (accessed 5 January 2016).
United Nations. *United Nations Framework Convention on Climate Change*. (Geneva, United Nations, 1992) https://unfccc.int/resource/docs/convkp/conveng.pdf (accessed 5 May 2016).

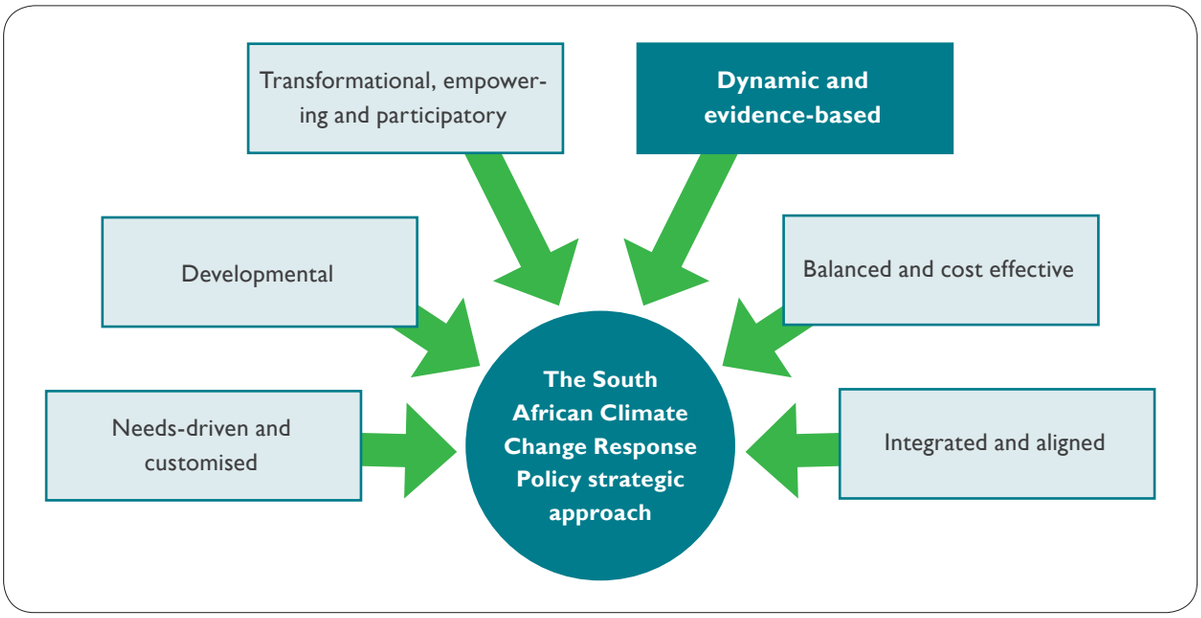


Figure 2: Pillars of the South African Climate Change Response Policy strategic approach

The Near-term Priority Flagship Programmes respond to the three key challenges facing South Africa and other countries as global efforts to address climate change intensify:

- **Demonstrating the course of actions needed to respond to climate change effectively and efficiently** is not only possible, but highly beneficial, unlocking and realising significant social, economic and environmental benefits.
- **Attracting resources at the scale required to enable meaningful transformation**, namely transformation at a scale that effectively limits atmospheric GHG emissions and/or enables adaptation to the impacts of unavoidable climate change.
- **Igniting national-scale action at the speed required to respond to climate change**, namely limiting GHG emissions and/or enabling adaptation to the impacts of unavoidable climate change with the necessary urgency.

These Near-term Priority Flagship Programmes facilitate a cohesive transition to a resilient, low-carbon future and a more diverse and inclusive economy in the following ways:

- **Providing a national governance/coordination mechanism:** Through the identification of the relevant line ministry and subsequent linkages to recognition and fiscal support, relevant staff, political support/champions, policies/strategies and other relevant elements and the establishment of a steering body for Flagship Programmes comprising programme implementers across government.
- **Realising sustainable development benefits:** Incorporating proposals for realising local sustainable development benefits, including employment, poverty alleviation, industrial development, reduction in local air pollution and other relevant elements in all Flagship Programmes.
- **Making the climate change benefits of response measures transparent and quantifiable:** The Near-term Priority Flagship Programmes are required by the NCCRP to develop and incorporate

climate change as a key programme success metric, with a set of relevant indicators and well-defined linkages in the form of the National Climate Change Monitoring and Evaluation System.

- **Identification of anchor points for priority areas both for adaptation and mitigation:** The Near-term Priority Flagship Programmes components and specific activities are cross-referenced in both Sections 4 and 5 of the NCCRP, which focus on adaptation and mitigation respectively. In both cases, the NCCRP describes and demonstrates how policy can be implemented and built around a strategic set of actions, as represented by the Near-term Priority Flagship Programmes.

The NCCRP provides guidance on the development and the implications of the Near-term Priority Flagship Programmes in five key areas (**Figure 3**).

2.2.1 Approach to developing and implementing the Near-Term Priority Flagship Programmes

The Near-term Priority Flagship Programmes address key mitigation and adaptation imperatives. The NCCRP provides a high-level description of each these programmes, broadly outlining the key programme components and indicating the key role-players involved in their implementation.

The NCCRP also details a set of steps to be taken to develop and operationalise the Near-term Priority Flagship Programmes, led by the relevant line ministry and overseen by the Inter-Ministerial Committee on Climate Change (IMCCC) and the Inter-Governmental Committee on Climate Change (IGCCC). The coordination and implementation of the Flagship Programme is linked to National Government's five year implementation plan, the Medium Term Strategic Framework (MTSF). The MTSF is structured around priority outcomes, with outcome 10, Protect and Enhance Our Environmental Assets and Natural Resources, focusing on South Africa's transition to a climate-change resilient, low-carbon economy and society.[5]

The steps to develop and operationalise the Flagship Programmes are detailed in **Figure 4**.

The immediate implementation of Near-term Priority Flagship Programmes comprises three scaling-up pathways shown in **Figure 5**.

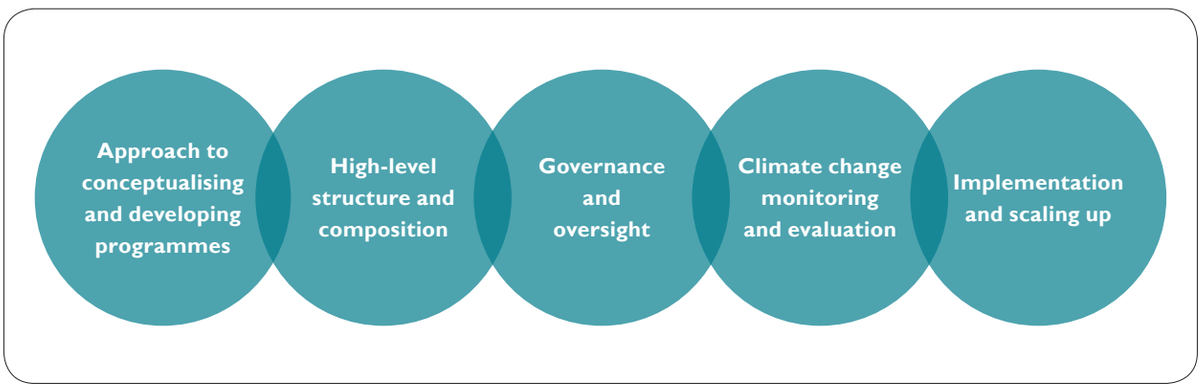


Figure 3: National Climate Change Response Policy guidance on the Near-term Priority Flagship Programmes

5 The Presidency, *Medium Term Strategic Framework (MTSF) 2014–2019*, (Pretoria: The Presidency, 2013) 28. http://www.dpme.gov.za/news/MTSF/MTSF%202014-2019.pdf

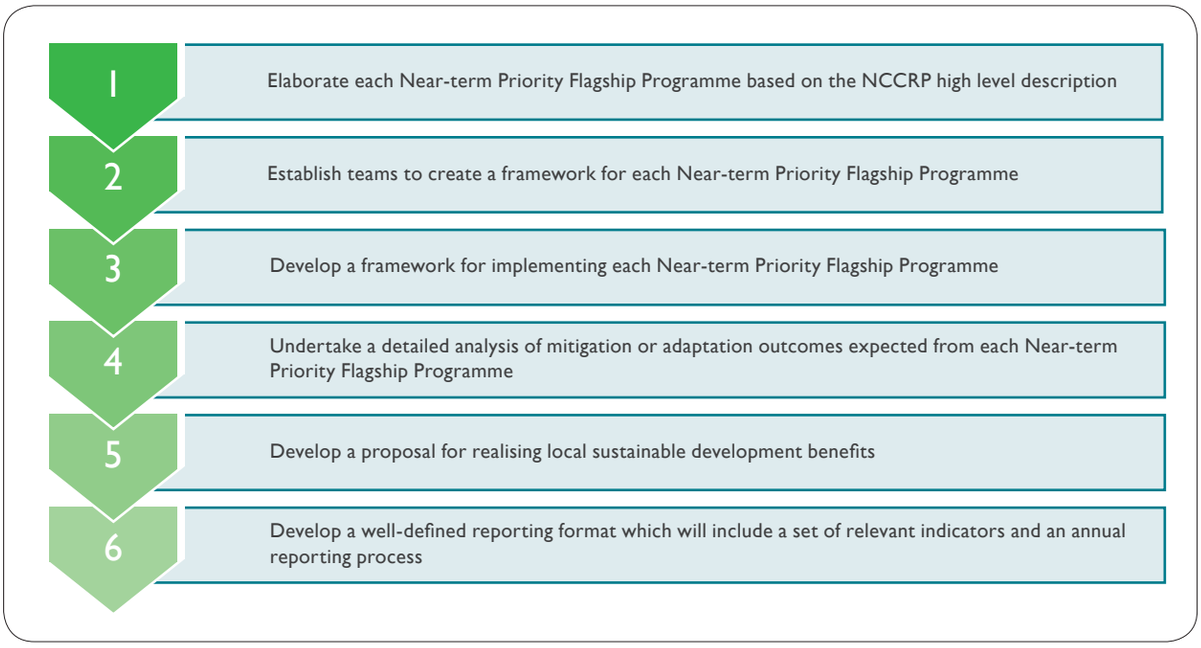


Figure 4: Steps detailed in the National Climate Change Response Policy on implementing the Near-term Priority Flagship Programmes

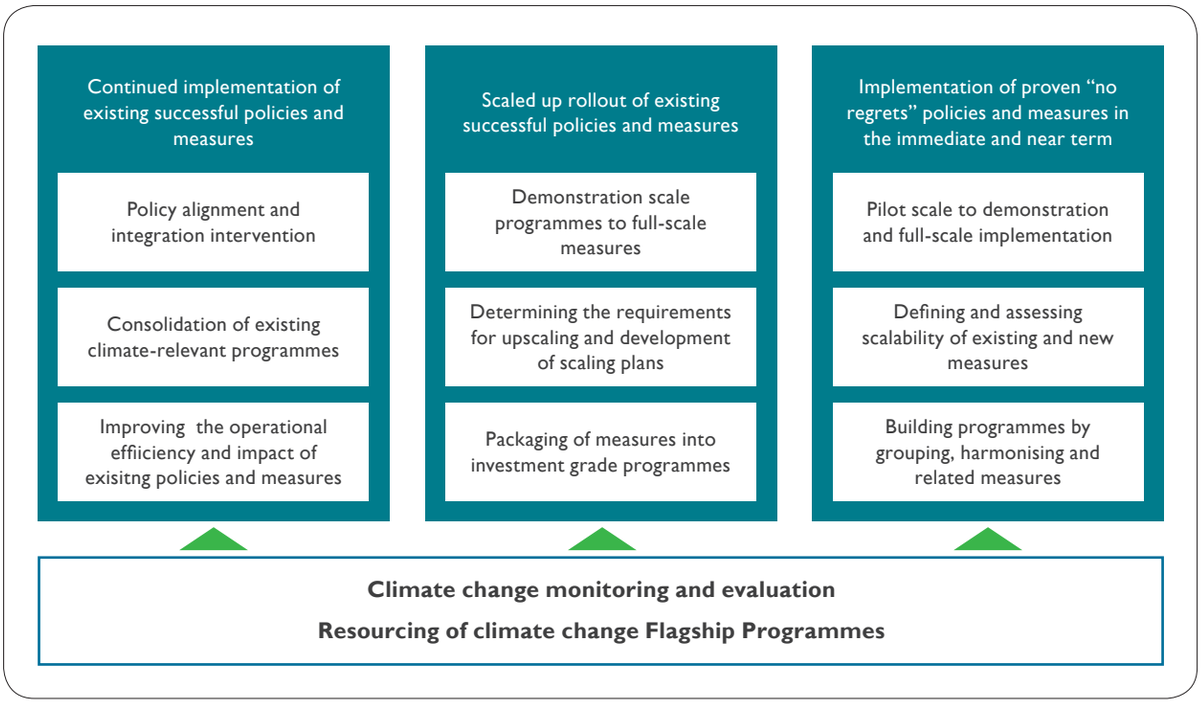


Figure 5: Implementation and scaling up pathways for Near-term Priority Flagship Programmes

Key Messages

- The Near-term Priority Flagship Programmes are strategic, large-scale measures of national significance.
- The National Climate Change Response Policy gives effect to the Flagship Programmes and recognises them as an integral part of South Africa's climate change response policy.
- The Near-term Priority Flagship Programmes respond to the three key challenges facing South Africa:
  - demonstrating the course of actions needed to respond to climate change effectively and efficiently
  - attracting resources at the scale required to enable meaningful transformation
  - igniting national-scale action at the speed required to respond to climate change.
- The Flagship Programmes facilitate a cohesive transition to a resilient low-carbon future and a more diverse and inclusive economy in the following ways:
  - Providing a national governance/ coordination mechanism
  - Realising sustainable development benefits
  - Making the climate change benefits of response measures transparent and quantifiable
  - Identifying anchor points for priority areas both for adaptation and mitigation.

2.3 Locating the Near-Term Priority Flagship Programmes in the National Development Plan 2030

The NDP constitutes South Africa's framework for economic and social development and aims to accelerate growth to eliminate poverty and reduce inequality by 2030.[6]

The NDP recognises that bold, but realistic, strategies are required to achieve South Africa's developmental goals and it identifies and provides guidance on three ways to do this:

- The NDP provides a set of guiding principles for the transition to a low emissions and climate resilient economy and society.
- The NDP proposes a specific suite of measures to achieve environmentally sustainable, climate resilient and low carbon economic growth and social development.
- The NDP provides a consolidated plan of action for South Africa's development integrating all aspects of the South African economy and society.

In line with one of the guiding principles of the NDP, the Near-Term Priority Flagship Programmes represent a managed transition from an unsustainable carbon intensive trajectory to a lower carbon trajectory, building on existing processes and capacities to enable an organised and phased transition that allows society to adapt accordingly.

The NDP does not refer to the Near-term Priority Flagship Programmes, however, the suite of measures identified as necessary to realising the NDP vision include most of the programmatic elements of individual Near-term Priority Flagship Programmes (**Table 2**).

6 National Planning Commission. *National Development Plan.*

Table 2: Sustainable development targets included in the NDP

Focus	Target	Corresponding/relevant Near term Priority Flagship Programme
Environment	• Achieve the peak, plateau and decline trajectory for greenhouse gas emissions, with the peak being reached around 2025. • By 2030, an economy-wide carbon price should be entrenched. • Implement zero emissions building standards by 2030. • Absolute reductions in the total volume of waste disposed to landfill each year. • Improved disaster preparedness for extreme climate events. • Increased investment in new agricultural technologies, research and the development of adaptation strategies for the protection of rural livelihoods and expansion of commercial agriculture.	• RE Flagship Programme • EEEDM Flagship Programme • Waste Management Flagship Programme • Adaptation Research Flagship Programme
Expanded Public Works Programme	• Expand public employment programmes to 1 million participants by 2015 and 2 million by 2020.	• Climate Change Response Public Works Flagship Programme
Energy	• At least 20 000MW of energy capacity should come from renewable sources. • Reduce carbon emissions from the electricity industry from 0.9kg per kilowatt-hour to 0.6kg per kilowatt-hour. • Improve the energy efficiency of mining and mineral processing by 15%.	• RE Flagship Programme • EEEDM Flagship Programme
Water	• Ensure that all people have access to clean, potable water and that there is enough water for agriculture and industry, recognising the trade-offs in the use of water.	• WCWDM Programme
Transport	• The proportion of people who use public transport for regular commutes will expand significantly. • By 2030, public transport will be user friendly, less environmentally damaging, cheaper and integrated or seamless.	• Transport Flagship Programme
Human Settlements	• A strong and efficient spatial planning system, well integrated across the spheres of government. • Upgrade all informal settlements on suitable, well located land by 2030. • More people living closer to their places of work. • Better quality public transport is available. • There are more jobs in, or close to, dense, urban townships.	• Integrated implementation of multiple Flagship Programmes

2.4 Locating the Near-Term Priority Flagship Programmes in Nationally Appropriate Mitigation Actions

NAMAs are one of the cornerstones of international climate negotiations. The term was first introduced in the Bali Action Plan of 2007. The UNFCCC defines NAMAs, as "any action that reduces emissions in developing countries and is prepared under the umbrella of a national governmental initiative". NAMAs are increasingly becoming a prominent climate policy instrument for developing countries, covering planned, voluntary GHG mitigation action undertaken as part of a country's sustainable development objectives.[7]

The UNFCCC NAMA Registry has been set up to facilitate the matching of finance, technology and capacity building support with these actions, and to recognise other

7 UNFCCC, 2014. "Focus: Mitigation - NAMAs, Nationally Appropriate Mitigation Actions." http://unfccc.int/focus/mitigation/items/7172.php (accessed 5 May 2016)

NAMAs formally submitted to the UNFCCC NAMA Registry by the designated national NAMA approver. In essence, NAMA notification indicates that a UNFCCC-backed label is assigned to national development activities with mitigation effects and seeks to do the following:

- showcase a country's unilateral mitigation activities
- attract international support for the implementation of such activities via financial, technical or capacity building assistance

NAMAs cover many sectors and can take numerous forms. They range from cross-sectoral policies and strategies, to specific policy instruments and actions at both programme and project level. A NAMA can be specified at any point during the development of a programme, from the conceptualisation and scoping stage through to the development of a full investment grade proposal and ultimately implementation. A unifying concept across all NAMAs, no matter of what type, is that the GHG emission impact meets the requirements for measurement, reporting and verification.[8]

In the South African context, there is a complete overlap in the thematic areas included in NAMAs and those comprising the mitigation Flagship Programmes. As a result, South Africa's NAMAs are nested and developed within the Near-term Priority Flagship Programmes and are the building blocks or components of these programmes.

The Flagship Programmes are complex undertakings. Designating specific components of programmes as NAMAs allows for greater agility and speed in programme development. This targeted development approach addresses specific programme objectives systematically and facilitates more efficient use of the limited human resources available. Subdividing a Flagship Programme along these lines simplifies the complexity and demands of measurement, reporting and verification (MRV).

The ultimate objective is to build mitigation Flagship Programmes with strong governance and sufficiently robust MRV to register as NAMAs in their entirety.

Figure 6 provides an overview of the Flagship Programmes/NAMA linkages in South Africa.

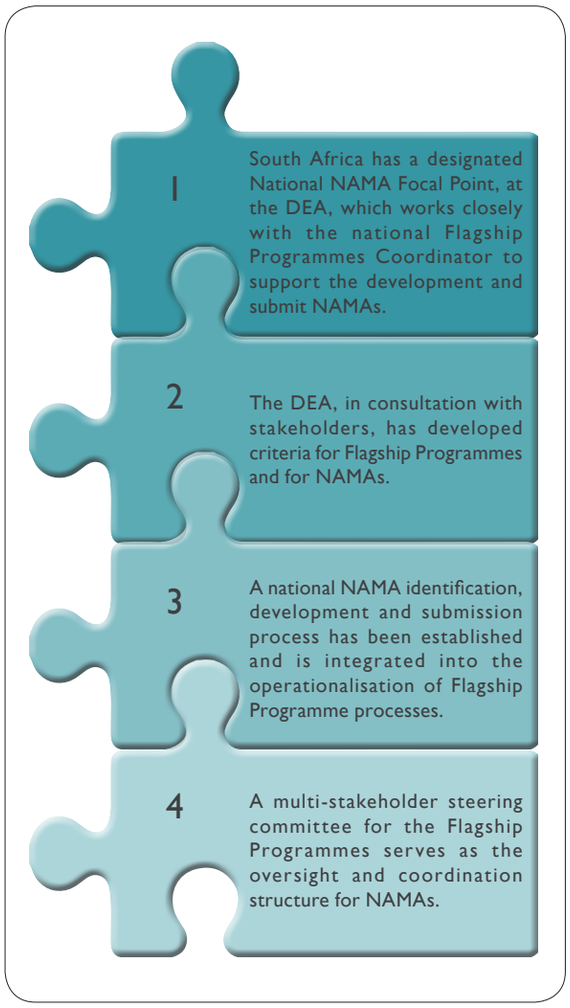


Figure 6: Enabling NAMA development and submission through the Near-term Priority Flagship Programmes

8 International Renewable energy Agency (IRENA). *IRENA Handbook on Renewable Energy Nationally Appropriate Mitigation Actions (NAMAs) – 2nd edition*. (Abu Dhabi: IRENA, 2014). Available at: http://www.irena.org/DocumentDownloads/Publications/IRENA_NAMAs_handbook_2014_EN.pdf (accessed 10 May 2016).

The Near-term Priority Flagship Programme mechanism is well placed to link national priority measures with climate finance and other climate support mechanisms, however the maturity of the current flagship programme governance framework and structure, makes it difficult to provide the necessary MRV that is core to the NAMA approach.

Thus the current approach to NAMAs is to focus on measures which have a sufficiently well-developed governance framework and well-defined activity boundaries to allow for quantification of the GHG emission reductions resulting from the measures, using globally-recognised and scientifically rigorous methods. This is one of the core areas of focus of the support that the Department of Environmental Affairs (DEA) is providing to relevant line departments within the context of the Near-term Priority Flagship Programmes and the overall climate change response more broadly.

The DEA is providing dedicated MRV support, guidelines and tools to NAMA developers to improve this aspect of programme development and ultimately to increase the climate change benefits of response measures. The quality and efficacy of the climate change MRV aspects of response measures has been enhanced by the establishment of the National Climate Change Monitoring and Evaluation (M&E) System.

The mitigation Near-term Priority Flagship Programmes are not necessarily the sole source of NAMAs for South Africa. However, they do represent the country's de facto portfolio of NAMAs which are built on a solid foundation of policy interventions, projects and initiatives anchored within key departments with political support and for which public sector funding can be leveraged.

Table 3 provides an overview of the differences and similarities between NAMAs and the Near-term Priority Flagship Programmes.

The Near-term Priority Flagship Programmes provide the ideal opportunity to use the NAMA Registry to attract funding and technical support for the full implementation

Table 3: Differences and similarities between the Near-term Priority Flagship Programmes and NAMAs

Aspect	Near-term Priority Flagship Programmes	Nationally Appropriate Mitigation Actions
Coverage	Adaptation and mitigation focus	Mitigation only
Approach	Programme approach	Project or programme approach
Core measures	Actions with a direct mitigation or adaptation impact	Policies, strategies, programmes, and projects
Implementation readiness	Pilots and demonstration scale measures	Research, proof of concept, pilots and demonstration scale measures
Scope	Complex undertaking focusing on multiple aspects of a set of mitigation or adaption measures	Narrow undertaking typically focusing on one aspect or objective of a programme
Scale	National scale	National scale and subnational scale (if scalable)
MRV complexity and demands	Highly complex due the composite nature of programmes	Fewer and less complex MRV requirements due to relatively narrow scope and limited objectives
Governance complexity	Highly complex due the composite nature of programmes	Simpler governance structure and coordination requirements as NAMAs typically focus on a specific aspect of a mitigation programme

of the NAMAs, as well as recognition and showcasing of NAMAs already implemented by South Africa.

A prime example of these efforts, is the development of the Energy Efficiency in Public Buildings Programme (EEPBP) NAMA, integrating energy efficiency measures at a national, provincial and local government level.

2.4.1 An example of a NAMA: South Africa's Energy Efficiency in Public Buildings Programme vertically integrated NAMA

The EEPBP scales up the practical implementation of the Energy Efficiency and Energy Demand Management Near-term Priority Flagship Programme by:

- Integrating the efforts of all spheres of government in the implementation of energy efficiency measures, with the overall goal of all South African spheres of government (national, provincial and municipal) contributing to the national GHG mitigation, energy efficiency and energy security targets.
- Unlocking private sector expertise and resources, particularly within the provincial and municipal government spheres, through the use of shared savings contracting with energy savings companies (ESCOs).
- Introducing consistent and transferrable MRV practices within all three spheres of government in the measurement of the climate change benefits of energy efficiency.

The Department of Energy (DOE), Department of Public Works (DPW) and the DEA have jointly developed the EEPBP Flagship Programme and have actively steered the development of the EEPBP during the last three years. The development of the EEPBP is supported by the International Climate Initiative (IKI) of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) funded Vertically Integrated Nationally Appropriate Mitigation Actions (V-NAMA) programme on NAMA proposal development in the public buildings sector, implemented by GIZ. Selected provinces and municipalities were involved in the preparation of EEPBP proposals during the last three years and have formalised this partnership within the V-NAMA programme through council resolutions or equivalent mechanisms. The lead departments, the DPW, the DoE and the DEA, have submitted a funding proposal for the implementation of the EEPBP Programme to the NAMA Facility.

The EEPBP, which overlaps considerably with the Green Energy Strategic Integrated Project (SIP 8),[9] in the *South African National Infrastructure Plan*, is an excellent example of how climate finance and other climate support mechanism can contribute to the implementation of the NDP through the Flagship Programmes and SIPs. A similar process is underway to develop waste NAMAs as part of scaling up the Waste Management Near-term Priority Flagship Programme.

An overview of the EEPBP key elements and the envisaged impact is shown in **Figure 7**.

Solar panels and wind turbine generating electricity for the electricity offices in Buffalo City Municipality

9 Presidential Infrastructure Commission. *A summary of the South African National Infrastructure Plan*. (Pretoria: Presidential Infrastructure Commission, 2012) 20. Available at: http://www.gov.za/sites/www.gov.za/files/PICC_Final.pdf (accessed 10 May 2016).

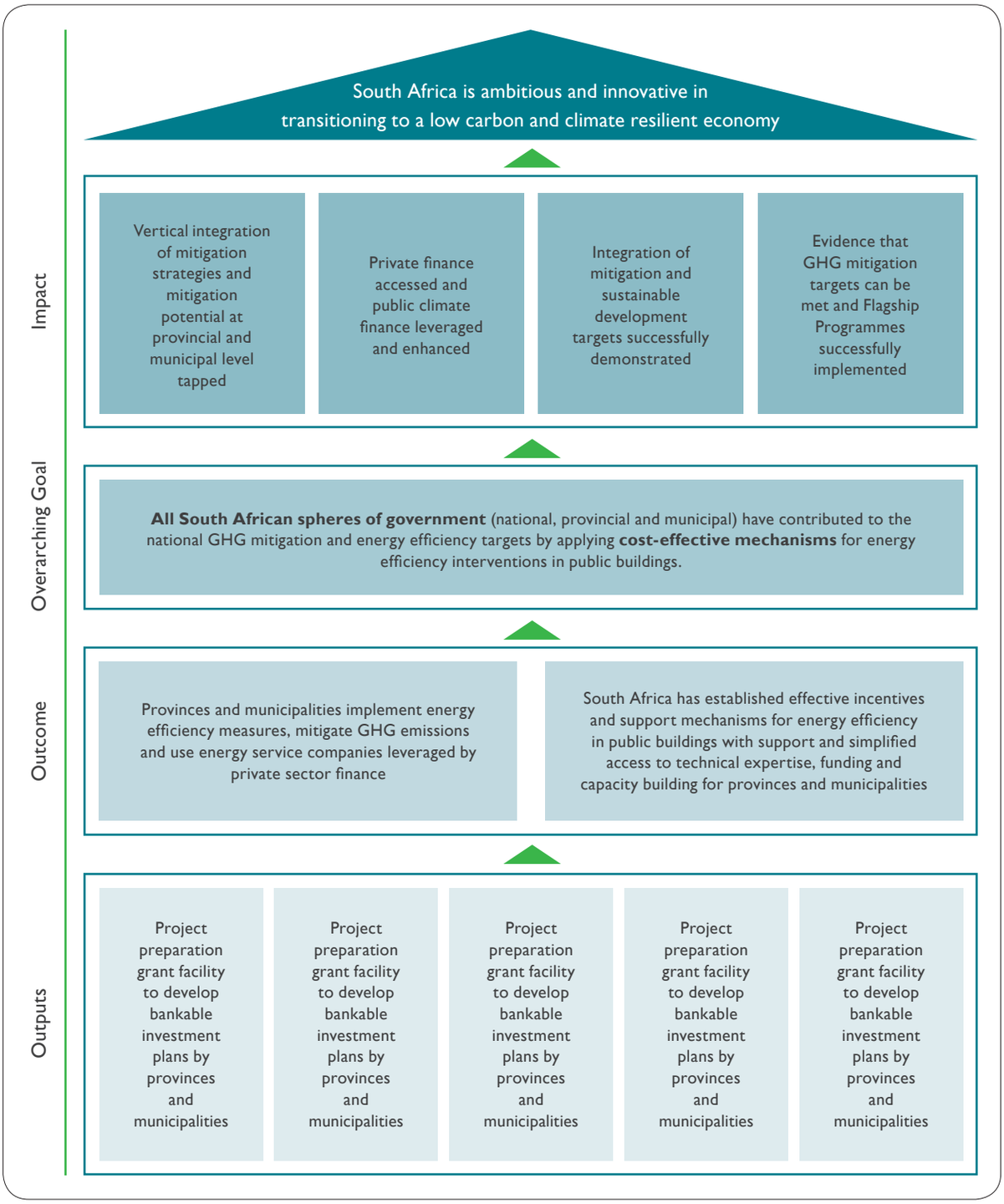


Figure 7: Theory of change for the Energy Efficiency in Public Buildings Programme – Vertically Integrated Nationally Appropriate Mitigation Action

2.5 Locating the Near-Term Priority Flagship Programmes in South Africa's Intended Nationally Determined Contribution (INDC)

For the first time in the history of the UNFCCC, the Conference of the Parties (COP) agreed at COP 19 in Warsaw in 2014 that all countries would prepare and submit their contribution to global efforts to mitigate and adapt to climate change prior to the COP 21 meeting in Paris in 2015.

South Africa submitted its intended nationally determined contribution (INDC) to the UNFCCC in September 2015.[10] The scope of the INDC covers adaptation and mitigation as well as finance and investment requirements for both (**Figure 8**).

South Africa's INDC provides significant insights into the direction that the country's climate change response will take into the future. It is, therefore, useful to describe the role and importance of the climate change Flagship Programmes in achieving the INDC.

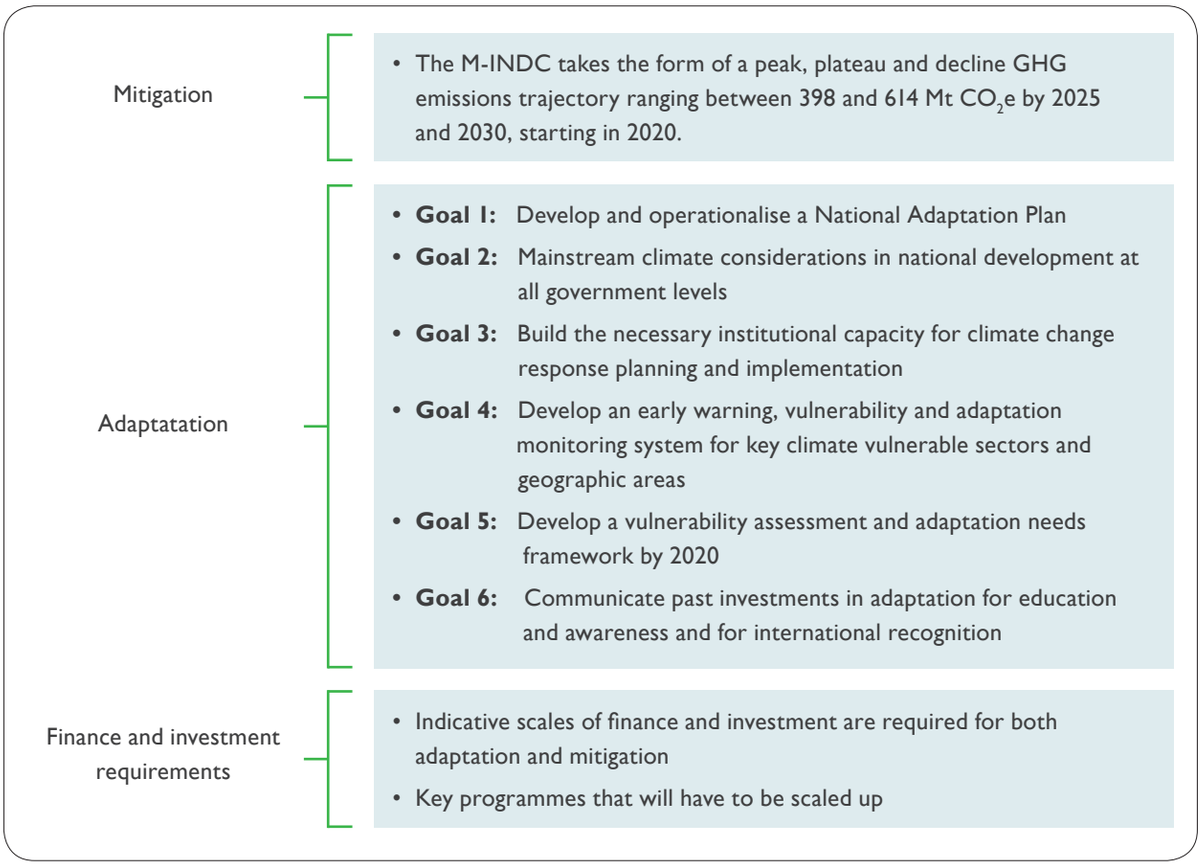


Figure 8: South Africa's Intended Nationally Determined Contribution[11]

10 Republic of South Africa. South Africa's Intended Nationally Determined Contribution (INDC).

11 Ibid.

Table 4: Key programmes and climate change response measures for scaling in the support component of South Africa's INDC

Component	Key Programmes and Measures to be Scaled Up	Corresponding Climate Change Near-term Priority Flagship Programme
Adaptation	• Working for Water, Working on Fire, Working on Wetlands and land restoration • Water conservation and demand management	• The Climate Change Response Public Works Flagship Programme • The WCWDM Flagship Programme
Mitigation	• Renewable Energy Independent Power Producer Procurement Programme • Solar photovoltaics, solar water heaters and wind • Decarbonised electricity by 2050 • Carbon capture and storage • Energy efficiency and advanced bio-energy • Investment in public transport infrastructure and electric vehicles	• The RE Flagship programme • The EEDSM Flagship Programme • The Carbon Capture and Sequestration Flagship Programme • The Transport Flagship Programme

The support component of the INDC (S-INDC) identifies some of the key programmes that will have to be scaled up to enable South Africa to transition to a low carbon and climate resilient economy and society, thus making a contribution to the global climate change response effort.

The key elements of the (S-INDC) are shown in **Table 4**.

There is a significant overlap between the S-INDC programmes identified for scaling up and resourcing, and the current set of climate change response Flagship Programmes. This means that, in many ways, the Flagship Programmes form the basis for South Africa's INDC.

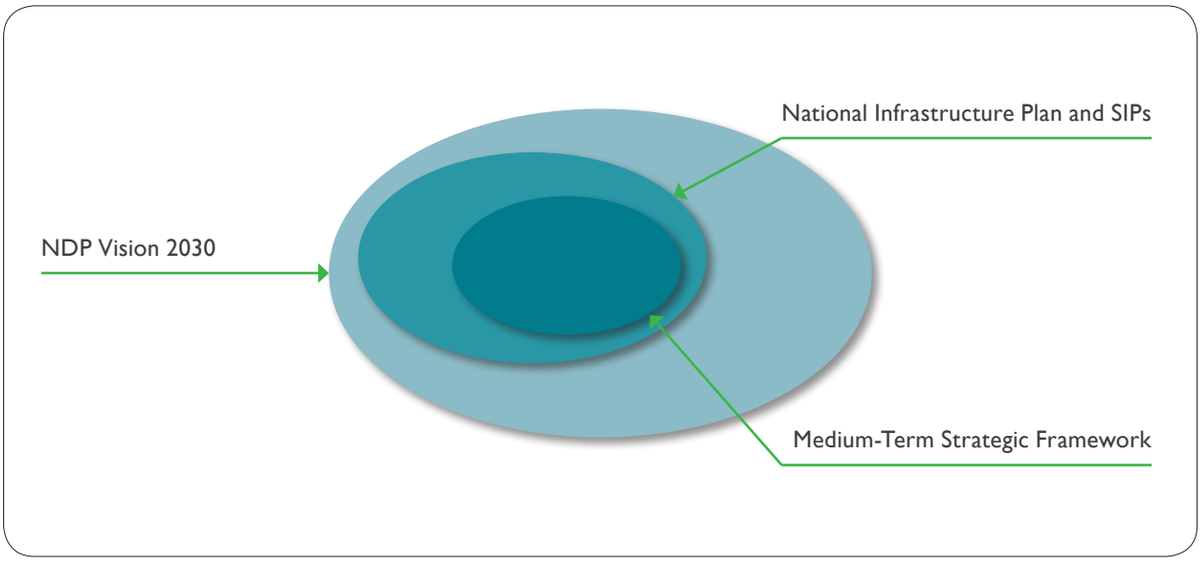


Figure 9: Linking the NDP, the National Infrastructure Plan's Strategic Integrated Projects and the MTSF 2014–2019

2.6 Locating the Near-Term Priority Flagship Programmes in the Strategic Integrated Projects (SIPs)

The South African Government has identified large scale infrastructure investment and development as the primary vehicle for realising the NDP vision.[12] The NDP feeds into the National Infrastructure Plan (NIP) and in turn into the Medium-term Strategic Framework, as illustrated in **Figure 9**.

The NIP was adopted by Cabinet in 2012 and guides the infrastructure drive through the implementation of 18 prioritised strategic integrated projects (SIPs). Each SIP comprises a large number of specific infrastructure projects and is coordinated by the Presidential Infrastructure Coordinating Commission (PICC), chaired by the President of South Africa.[13]

The SIPs merit closer examination in relation to the Near-term Priority Flagship Programmes for two main reasons:

- The SIPs are essentially the implementation of the NDP and thus the key drivers of economic growth, social development and reducing social inequality.
- There is considerable overlap in the coverage and focus of the SIPs and the Near-term Priority Flagship Programmes.

There is notable overlap in the coverage and focus of the SIPs and the Near-term Priority Flagship Programmes, and they often include the same set of measures, though neither the NIP nor the SIPs mention the term "Near-term Priority Flagship Programme" or make any reference or links to the Near-term Priority Flagship Programme (**Table 5**).

Solar Panels at the Black River Park

12 National Planning Commission. *National Development Plan 2030*.

13 Presidential Infrastructure Commission. *A summary of the South African National Infrastructure Plan*.

Table 5: An overview of the current set of Strategic Integrated Projects

Type of SIP	Description of the SIP	Corresponding/ relevant flagship programme
Geographic SIP	• **SIP 1:** Unlocking the northern mineral belt with Waterberg as the catalyst • **SIP 2:** Durban-Free State-Gauteng logistics and industrial corridor • **SIP 3:** South-Eastern node and corridor development • **SIP 4:** Unlocking the economic opportunities in North West Province • **SIP 5:** Saldanha-Northern Cape development corridor	• The Transport Flagship Programme
Energy SIPs	• **SIP 8:** Green energy in support of the South African economy • **SIP 9:** Electricity generation to support socio-economic development • **SIP 10:** Electricity transmission and distribution for all	• The RE Flagship Programme • The EEEDM Flagship Programme
Spatial SIPs	• **SIP 6:** Integrated municipal infrastructure project • **SIP 7:** Integrated urban space and public transport programme • **SIP 11:** Agri-logistics and rural infrastructure	• Integrated implementation of multiple flagship programmes and in particular, the energy flagship programmes, water, waste, transport and public works flagship programmes
Social infrastructure SIPs	• **SIP 12:** Revitalisation of public hospitals and other health facilities • **SIP 13:** National school build programme • **SIP 14:** Higher education infrastructure	• Integrated implementation of multiple flagship programmes, of particular relevance are the energy, water, waste and adaptation flagship programmes
Knowledge SIPs	• **SIP 15:** Expanding access to communication technology • **SIP 16:** SKA and Meerkat	• Implications and benefits for the implementation of multiple flagship programmes, particularly in the areas of data management and monitoring and evaluation
Regional SIPs	• **SIP 17:** Regional integration for African cooperation and development	• Implications and benefits for the implementation of multiple flagship programmes and in particular renewable energy,
Water and sanitation SIPs	• **SIP 18:** Water and sanitation infrastructure	• The WCWDM Flagship Programme

The 2014–2019 MTSF chapter on Outcome 10, which aligns all five-year strategic plans and annual plans across government, provides further guidance on the crafting of the vision and mission of the Near-term Priority Flagship Programmes.

Outcome 10 of the MTSF identifies the period leading up to 2020 as an opportunity to pilot and test concepts and ideas to determine if these can be scaled up, with a view to attaining full-scale implementation of these programmes from 2019.[14]

Climate change mitigation is addressed extensively through SIP 8, which focuses on the rollout of renewable energy as per the Integrated Resource Plan (IRP 2010).[15] There is, however, signification opportunity to expand and deepen the climate change benefits of SIP 8 beyond its current extent. Currently the SIPs do not explicitly incorporate adaptation as a core theme of infrastructure rollout.

Building climate resilient infrastructure is important for safeguarding South Africa's development vision. Explicitly incorporating adaptation themes, such as climate resilient infrastructure helps ensure that the risks posed by climate change are identified early and plans made to limit any detrimental impact.[16]

The Flagship Programmes represent national-scale climate change programming, and focus on establishing a firm foundation for the next phase in the transition to a lower-carbon and climate-resilient economy and society. While the SIPs also represent national scale programming, they focus on infrastructure investment as the primary driver for development and job creation, and do not incorporate climate change related metrics as key success indicators.

As the primary implementing mechanism for the NDP Vision 2030, the SIPs represent the greatest opportunity to mainstream climate change into South Africa's economy and society. The climate change programmes are a well-defined and structured way of stimulating climate action, at scale and with the urgency required (**Figure 10**).

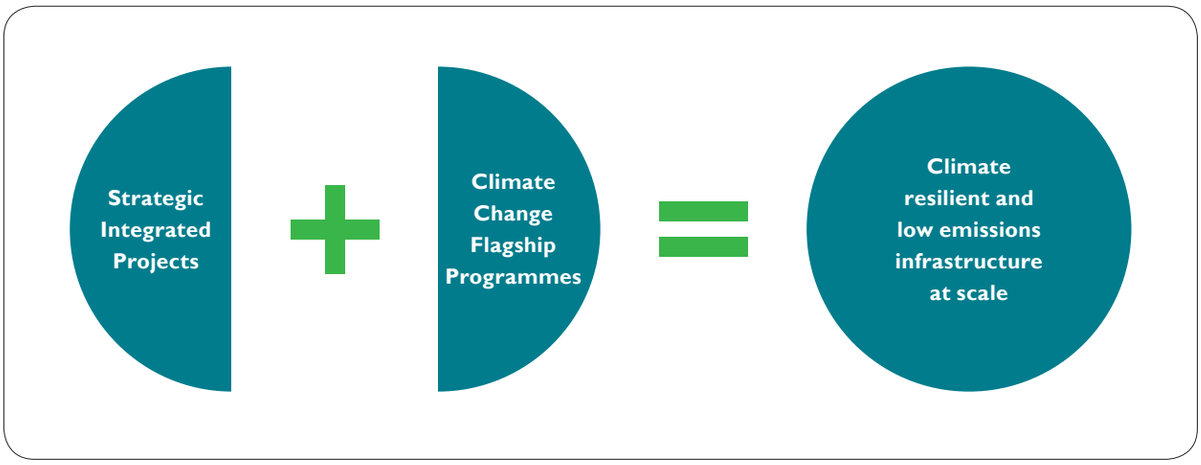


Figure 10: Mainstreaming climate change into South Africa's infrastructure drive through the Strategic Integrated Projects

14 Department of Planning, Monitoring and Evaluation. *The Medium-term Strategic Framework (MTSF) 2014-2019*. Appendix 10 Outcome 10: Protect and Enhance our Environmental Assets and Natural Resources. (Pretoria: DPME, 2013). Available at: http://www.dpme.gov.za/news/MTSF/MTSF%202014-2019.pdf (accessed 10 May 2016).

15 Department of Energy. *Integrated Resource Plan for Electricity 2010-2030: Update report 2013*. (Pretoria: DOE, 2013) Available at: http://www.doe-irp.co.za/content/IRP2010_updatea.pdf (accessed 9 May 2016)

16 Department of Environmental Affairs. Report No. 7 For The Long Term Adaptation Scenarios Flagship Research Programme (LTAS) (Pretoria: DEA, 2013)

Enhanced linkages and communication flows between the SIPs and the Flagship Programmes speak directly to the NDP's guiding principles for enabling environmental sustainability and an equitable transition to a low-carbon economy, namely:

- Early investment in low-carbon technologies that are least-cost and position South Africa to compete in a carbon-constrained world.
- An opportunity-focused approach which actively seeks synergies between sustainability, growth, competitiveness and employment creation.
- Transformative action that addresses system-wide and structural flaws of the economy and society with visionary thinking and innovative planning.
- Building on existing processes and capacities to enable a structured and phased transition.

The SIPs and the climate change Flagship Programmes are complementary and add significant value to South Africa's development and climate response when both are affiliated in an explicit and structured way.

The Flagship Programmes and SIPs, together, can yield significantly more benefits when they collaborate through the following actions:

- Explicitly considering climate change in implementing the SIPs.
- Recognising climate change metrics for adaptation and/or mitigation as key success metrics.
- Quantifying and widely recognising the climate change benefits of the infrastructure rollout, and wherever possible using them to strengthen South Africa's position internationally.
- Working to secure recognition of South Africa's national investments in adaptation as a contribution to the global climate change response effort.
- Establishing information flows between the sets of measures and supporting them with appropriate institutional arrangements.
- Leveraging public funding under the SIPs to enhance access to climate finance and other climate change support resources.

The SIPs, which overlap so closely with the Flagship Programmes in coverage, are the logical focus area for using the Flagship Programmes to attract the investment needed to drive the NDP through infrastructure development. The NAMAs and other forms of climate support have the additional advantage of attracting technical expertise and capacity building programmes in the basket of resources available for boosting South Africa's transition to a climate resilient society and economy and building economic competitiveness.

The Flagship Programmes provide an opportunity to use the NAMA Registry to attract funding and technical support for the full implementation of the NAMAs, as well as recognition and showcasing of NAMAs already implemented by South Africa.

A schematic of the implementation linkages and the value added through linking the SIPs and the climate change Flagship Programmes is provided in **Figure 11**.

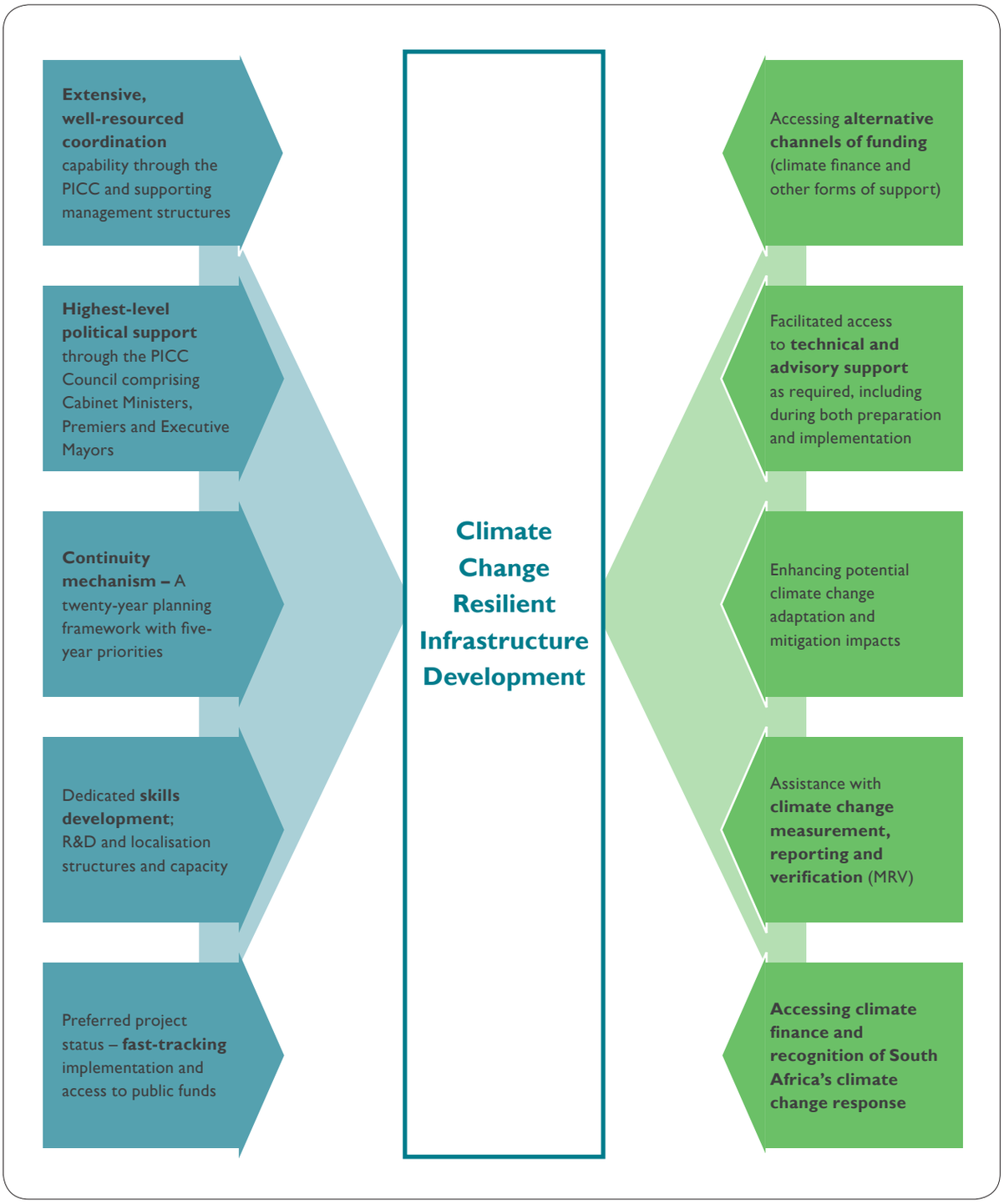


Figure 11: Value Added to South Africa's development and climate response by linking the SIPs and Climate Change Flagships

Key Messages

- Flagship Programmes are positioned to be a central point for further investment in South Africa's climate response, blending public and international climate finance.
- The suite of measures identified as necessary for realising the NDP vision include most of the programmatic elements of individual Near-term Priority Flagship Programmes.
- The Flagship Programmes can spur efforts to limit climate change and realise solutions to enhance South Africa's adaptive capacity and resilience. The social, economic and environmental benefits delivered through implementation of the Flagship Programmes advance the overarching objectives of the NDP.
- South Africa's NAMAs are nested and developed within the Near-term Priority Flagship Programmes.
- South Africa's approach to NAMAs is to focus on measures that have a sufficiently well-developed governance framework and well defined activity.
- The Flagship Programmes provide the ideal opportunity to use the NAMA Registry to attract funding and technical support for the full implementation of the NAMAs, as well as recognition and showcasing of NAMAs already implemented by South Africa.
- The Energy Efficiency in Public Buildings Programme (EEPBP) scales up the practical implementation of the Energy Efficiency and Energy Demand Management Near-term Priority Flagship Programme and is an excellent example of how climate finance and other support mechanisms can contribute to the implementation of the NDP through the Flagship Programmes and SIPs.
- NAMAs and INDCs emphasise transparency through robust climate change monitoring and evaluation.
- There is notable overlap in the coverage and focus of the SIPs and the Flagship Programmes.
- The SIPs represent the greatest opportunity to mainstream climate change into South Africa's economy and society, as the primary implementing mechanism for the NDP Vision 2030.
- Enhanced linkages and communication flows between the SIPs and Flagship Programmes speak directly to the NDP's guiding principles for enabling environmental sustainability and an equitable transition to a low-carbon economy.

3. UNPACKING THE NEAR-TERM PRIORITY FLAGSHIP PROGRAMMES

3.1 Overview

This section unpacks the current set of Near-term Priority Flagship Programmes taking a stepwise approach to unpacking the individual Flagship Programmes:

The purpose of this section is twofold:

- To provide an understanding of how the Near-term Priority Flagship Programmes have been implemented to date.
- To reflect on the key gaps and successes as the basis for enhancing implementation and impact going forward.

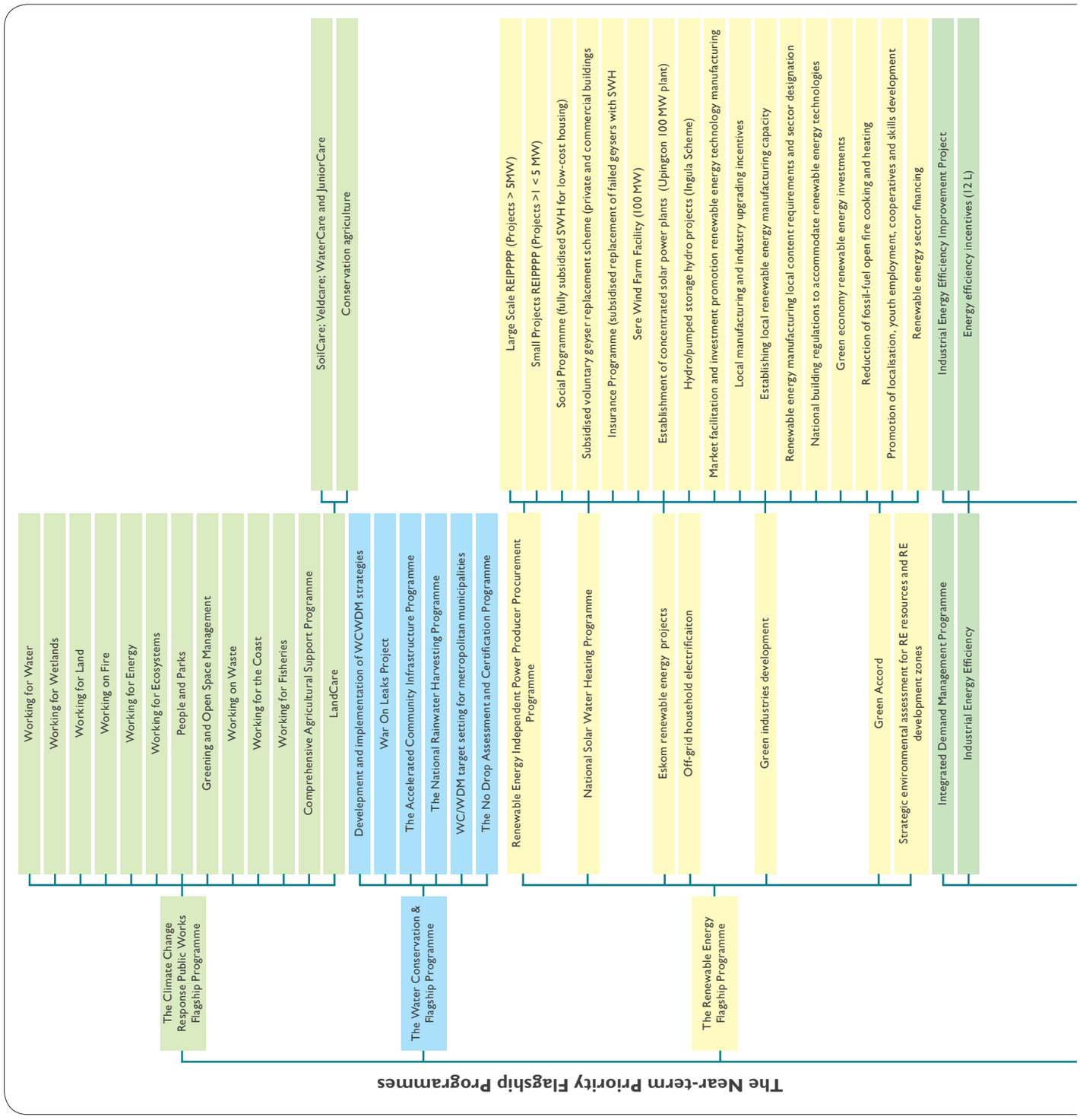

Concentrated solar plant at Bokpoort, Groblershoop

3.2 Building on the Guidance from the National Climate Change Response Policy – The Flagship Programmes Today

The initial set of Near-term Priority Flagship Programmes, which are described in the National Climate Change Response Policy, is made up of 39 distinct components in total. Each of these programmes is made up of sub-programmes, each of which can be disaggregated further into distinct projects, implemented typically at provincial and municipal scale.

The current form of the Near-term Priority Flagship Programmes (up to December 2015) includes the following individual components, arranged hierarchically from flagship programme level to distinct programme component and subcomponents in **Figure 12**.

The Individual Near-term Priority Flagship Programmes are discussed in detail in **Annexe I: Detailed Overview of Individual Near-term Priority Climate Change Flagship Programmes**.


The Near-term Priority Flagship Programmes
The Climate Change Response Public Works Flagship Programme
Working for Water
Working for Wetlands
Working for Land
Working on Fire
Working for Energy
Working for Ecosystems
People and Parks
Greening and Open Space Management
Working on Waste
Working for the Coast
Working for Fisheries
Comprehensive Agricultural Support Programme
LandCare
SoilCare; Veldcare; WaterCare and JuniorCare
Conservation agriculture
The Water Conservation & Flagship Programme
Development and implementation of WCWDM strategies
War On Leaks Project
The Accelerated Community Infrastructure Programme
The National Rainwater Harvesting Programme
WC/WDM target setting for metropolitan municipalities
The No Drop Assessment and Certification Programme
The Renewable Energy Flagship Programme
Renewable Energy Independent Power Producer Procurement Programme
National Solar Water Heating Programme
Eskom renewable energy projects
Off-grid household electrificaiton
Green industries development
Green Accord
Strategic environmental assessment for RE resources and RE development zones
Large Scale REIPPPP (Projects > 5MW)
Small Projects REIPPPP (Projects >1 < 5 MW)
Social Programme (fully subsidised SWH for low-cost housing)
Subsidised voluntary geyser replacement scheme (private and commercial buildings
Insurance Programme (subsidised replacement of failed geysers with SWH
Sere Wind Farm Facility (100 MW)
Establishment of concentrated solar power plants (Upington 100 MW plant)
Hydro/pumped storage hydro projects (Ingula Scheme)
Market facilitation and investment promotion renewable energy technology manufacturing
Local manufacturing and industry upgrading incentives
Establishing local renewable energy manufacturing capacity
Renewable energy manufacturing local content requirements and sector designation
National building regulations to accommodate renewable energy technologies
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
Integrated Demand Management Programme
Industrial Energy Efficiency
Industrial Energy Efficiency Improvement Project
Energy efficiency incentives (12 L)

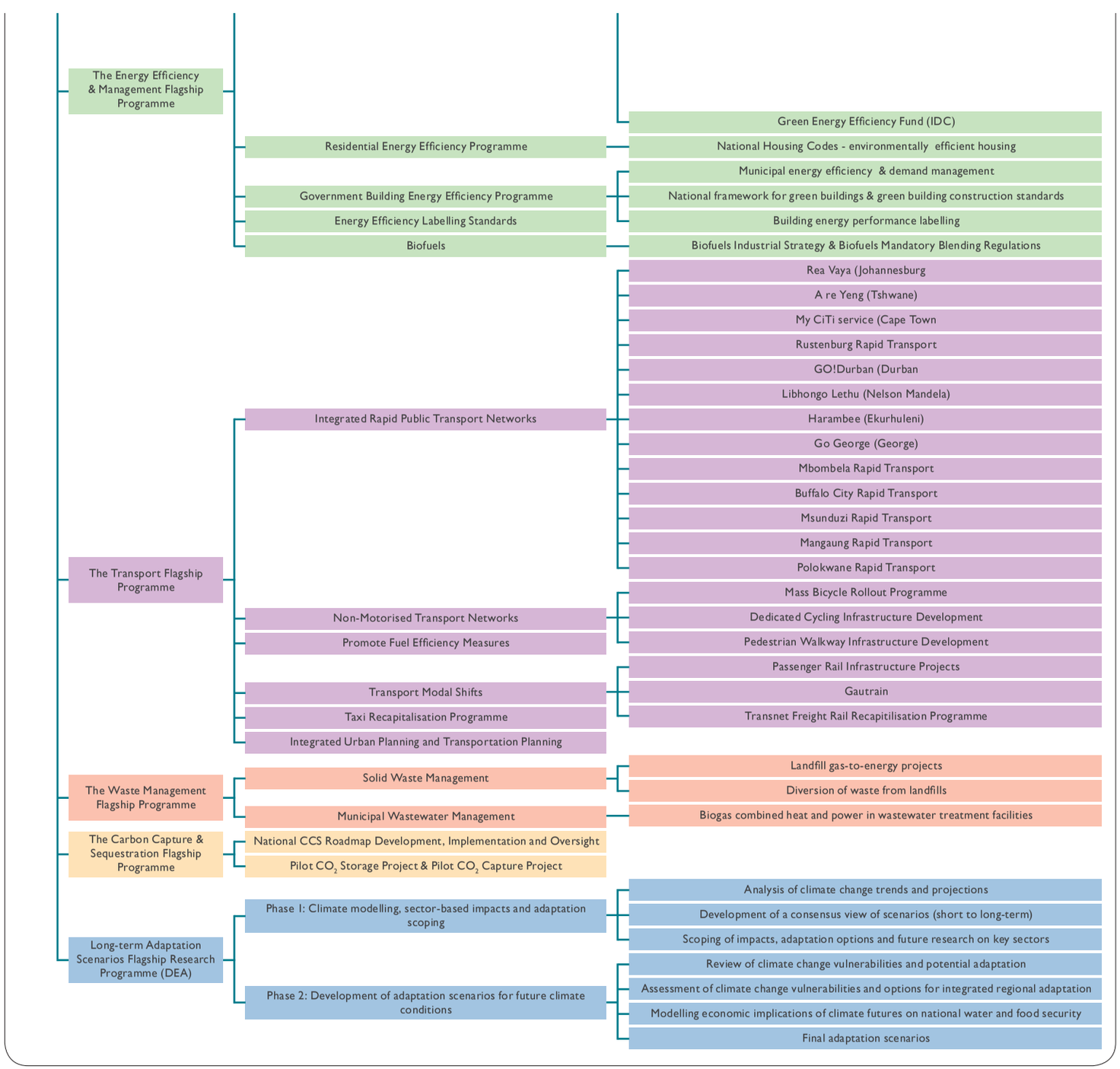


Figure 12: Overview of the Near-term Priority Flagship Programmes

3.3 Funding the Near-Term Priority Flagship Programmes

The vast majority of funding for implementing Flagship Programmes comes from public funds. Most Flagship Programmes do not have their own budgets and their realisation depends on effective coordination and management of different financial resources. In some cases Flagship Programme initiatives are supported by annual fiscal allocations in the form of specific conditional grants (for example Municipal Energy Efficiency and Demand-side Management Grants, the Expanded Public Works Programme (EPWP), integrated grants for municipalities and the Public Transport Infrastructure and Systems Grant (a mechanism for grant funding of public transport capital infrastructure).

A variety of internationally-supported climate financing mechanisms also exist and have been accessed to enable the implementation of different Flagship Programmes and/or individual components. Individual line ministries have successfully applied and used international funds. In 2010 The Clean Technology Fund, approved the investment plan, drafted under the leadership of the South African government in coordination with members of the World Bank Group and key South African stakeholders, and is now financing concentrated solar power (CSP), utility-scale wind power development and energy efficiency projects.[17]

A number of Development Finance Institutions (DFIs) have also collaborated with various South African stakeholders to develop renewable energy infrastructure and programmes including the African Development Bank (AfDB), Agence Française de Développement, and the International Bank for Reconstruction and Development, part of the World Bank Group. As part of the RE Flagship Programme, the Renewable Energy Independent Power Producer Procurement Programme (REI4P), the International Finance Corporation and the AfDB have directed resources to support REI4P's CSP projects. So far, this support has led to three CSP projects, totalling 250 MW of installed capacity.

The Industrial Development Corporation (IDC), a national development finance institution set up to promote economic growth and industrial development owned by the South African government, has supported renewable energy as the basis of a new industry with investment of over R6.6-billion in support of the REI4P.[18] Acting in partnership, the IDC and the German Development Bank (KfW) have established a R500 million facility available for energy efficiency and self-use renewable energy projects. To date R174 million in project finance has been made available.[19]

Due to the competitive nature of the REI4P programme, project developers have used climate finance mechanisms to submit lower prices (in ZAR/MWh terms) than their competitors while maintaining the bankability of projects. One of these instruments is the Clean Development Mechanism (CDM). The CDM recognises the positive contribution that can be made to mitigating climate change on a global level via the allocation of carbon credits, which can be commercialised and result in an additional revenue stream. Up to October 2014, approximately 79% of projects developed under the REI4P programme have been included under the CDM, which implies that at some level the revenue stream created from the sale of certified emission reductions (carbon credits) has been factored

17 International Finance Corporation (IFC). Blended Finance at IFC: *Blending Donor Funds for Impact. Spotlight: South Africa, South Africa's CTF Private Sector Renewable Energy Program*. (Washington DC: IFC, 2012). Available at: http://www.ifc.org/wps/wcm/connect/886715804d9df4e9ba7bbf48b49f4568/CTF+South+Africa.pdf?MOD=AJPERES (accessed 10 May 2016).

18 Industrial Development Corporation (IDC). Africa, partnerships key to IDC's vision, 18 September 2014. http://www.idc.co.za/home/media-room/articles/727-africa,-partnerships-key-to-idc-s-vision.html (accessed 10 May 2016).

19 N. Odendaal. South Africa's energy-saving initiatives gain momentum. *Engineering News*. 11 June, 2013. Available at: http://www.engineeringnews.co.za/article/south-africas-energy-saving-initiatives-gain-momentum-2013-06-11

into the bidding prices of these projects under the REI4P.[20]

Some of the individual municipal projects implemented under the Waste Management Flagship Programme have also used the CDM to improve the bankability of waste-to-energy mitigation projects. The Durban Landfill gas-to-electricity project at the Mariannhill and La Mercy landfills was registered as a CDM project in 2006 and issued with 3 3431 certified emission reductions (CERs) in 2013, and the Bisasar Road project was registered in 2009 and issued with 65 711 CERs in 2011. The Ekurhuleni Landfill Gas Recovery Project was registered as a CDM project in 2010 and the Nelson Mandela Bay Metropolitan's Landfill Gas Project, which involves methane recovery for flaring and electricity generation, was registered as a CDM project in 2012.[21]

South Africa accounts for over 30% of the registered CDM projects in Africa.[22]

The DEA has also supported various line ministries to access a range of resources available to mitigation or adaptation programmes in the form of capacity building, technical expertise and in some cases finance. The DEA is the custodian of the Green Fund, which is managed by DBSA to support low carbon growth initiatives and climate resilience. The fund was set up with an initial allocation of R800 million from Treasury in 2012. In addition, The South African National Biodiversity Institute (SANBI), under the DEA, is an accredited National Implementing Entity for the Adaptation Fund of the UNFCCC.

Generation unit at Mariannhill landfill site

20 H. Sa, and L. Nell. REIPPP projects under the Carbon Tax. *Ecometrix On*, 6 October 2014

21 Department of Energy. *South African CDM Projects Portfolio* (Up to 28 February 2014). (Pretoria: DOE, 2014). Available at: http://www.energy.gov.za/files/esources/kyoto/2014/South-African-CDM-Projects-Portfolio-up-to-28February2014.pdf (accessed on 10 May 2016)

22 Carsten Warnecke, Thomas Day, Noémie Klein. *Analysing the status quo of CDM projects: Status and prospects*. (Cologne: Ecofys, NewClimate Institute, May 2015). Available at: https://newclimateinstitute.files.wordpress.com/2015/05/newclimate_cdm_evaluation_summary_2015.pdf (accessed 10 May 2016).

3.4 Reflecting on the Near-Term Flagship Programmes

The vast majority of the Flagship Programme components have been implemented with notable success. The seeds for remarkable and bold transformative action have been sown; what is required now is a shift in focus to concrete mitigation and adaptation actions that are substantial, scalable and replicable.

Flagship Programmes need to be operationalised as climate change response actions to a greater extent. Operationalising the programmes entails actually effecting the necessary actions to implement each of the programmes according to the programme of action informed by the NCCRP with specific reference to programme level governance structures and climate change M&E.

Responding to the NCCRP's brief for Flagship Programmes going forward can be addressed by ensuring the following:

- Clearly defined and identifiable governance structures operating at an appropriate level to enable coordinated programme implementation.
- A common set of visible and easily understandable processes to put into operation each Flagship Programme as per the programme plan of action informed by the NCCRP.
- An easily identifiable focal point and programme coordinator for each Flagship Programme located at a sufficiently strategic level to have a holistic overview of each Flagship Programme, and able to coordinate the different programme components.
- Self-identification, branding and communication

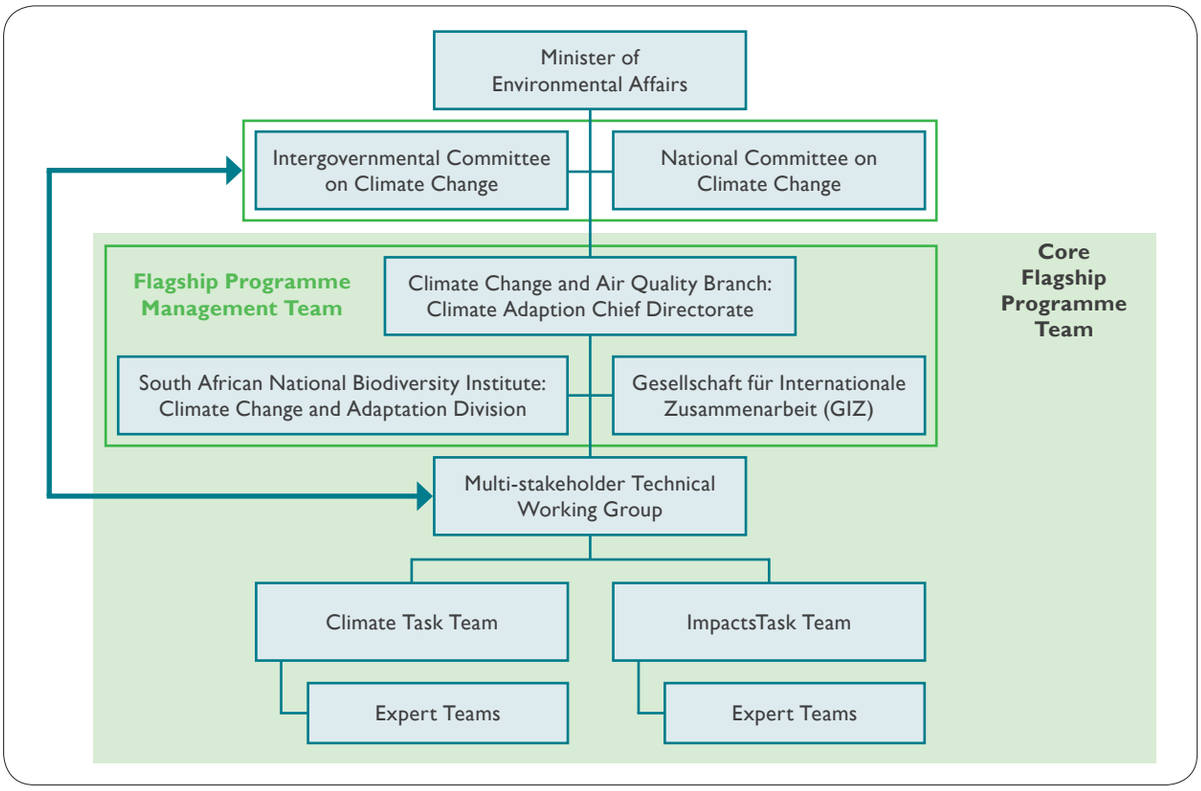


Figure 13: Long-Term Adaptation Scenarios Flagship Research Programme organisation and governance

of the respective programmes' components, as belonging to a Near-term Flagship Programme.

- The inclusion and communication of climate change as a key programme success metric.

Flagship Programme governance is one of the most important challenges and has serious implications for the operationalisation and scaling up of the Near-term Priority Flagship Programmes. These programmes are implementation programmes as defined by the Department of Planning Monitoring and Evaluation (DPME), however, the majority of Flagship Programmes are governed as National Treasury budget programmes. It is very seldom that the institutional structures for budget programmes align exactly with those of an implementation programme resulting in poor alignment, and compromised planning and coordination capability.

Figure 13 and **Figure 14** present an overview of the Adaptation Research Flagship Programme and the WCWDM Flagship Programme governance structures respectively. The Adaptation Flagship Programme has implementation level coordination structures, while the WCWDM Flagship Programme coordination is based on the Department of Water and Sanitation's (DWS's) budget level programming.

Of the eight Flagship Programmes, only three have implementation programme level governance structures, namely: the Waste Management Flagship Programme, the CCS Flagship Programme and the Adaptation Research Flagship Programme.

The WCWDM Flagship Programme, in contrast, uses departmental level budget programme structuring to coordinate the Flagship Programme; thus the programme

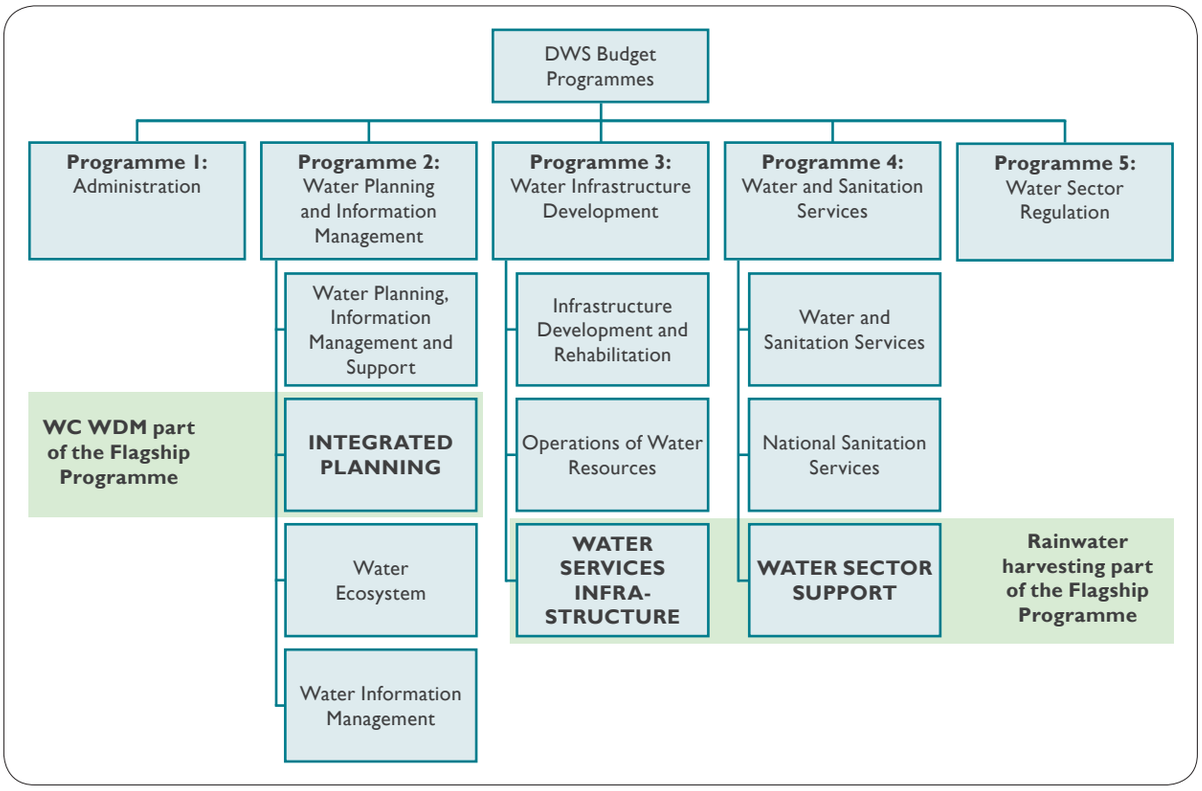


Figure 14: The Water Conservation and Water Demand Management Flagship Programme governance structure

spans three different line function units within the DWS. In addition some rainwater harvesting projects are coordinated by the Department of Agriculture, Forestry and Fisheries (DAFF) and the Department of Rural Development and Land Reform (DRDLR).

Most Flagship Programmes do not have a designated, easily identifiable focal point and programme coordinator, significantly inhibiting the coordination potential and institutional readiness of programme implementers.

Most departments have the climate change function in their structures but this function may be placed at a relatively low level without the ability/mandate to exercise strategic leadership and decision-making, and limiting the possibility of a holistic overview of all activities within a sector or even a department that form part of any Flagship Programme.

Many of the individual Flagship Programme components do not recognise themselves as belonging to a Flagship Programme due to the fragmentation induced by governance structures that are too high level to drive implementation at operational level. As a result implementation measures are typically positioned or identified and communicated as stand-alone measures, rather than as part of the comprehensive, systemic and coordinated set of actions that Flagship Programmes were envisaged as.

Due to the governance and coordination challenges, most Flagship Programme components are neither clearly nor consistently defined, making the quantification of climate change benefits difficult as there is often no clear programme boundary. This also makes it difficult to name the various programme components appropriately such that they may be tracked over time, which hampers climate change M&E.

Climate change M&E is integral to Flagship Programme implementation and scaling up. Currently, Flagship Programmes are made up of initiatives that predate the NCCRP; and although they may be effective climate change responses in and of themselves, they were originally implemented in response to non-climate change drivers. Thus the existing M&E systems do not necessarily take into account the climate change benefits of programmes. M&E systems for individual Flagship Programmes will need to be developed further in order to take into account the climate change mitigation or adaptation outcomes that result from the programmes.

Strengthening the governance and climate change M&E aspects of the programmes, will assist them in championing South Africa's climate change response efforts to even greater heights going forward. Establishing a common set of visible and easily understandable processes to put into operation for each Flagship Programme is another important enabler for effectively implementing these programmes.

Flagship Programmes are funded primarily through public funds but are increasingly making use of different funding mechanisms as they have managed, with spectacular success in some cases, to leverage private and international climate finance. Programmes have used various climate funding opportunities in the form of the CDM, NAMA funding, clean technology investment funds and other multilateral funding mechanisms.

There are opportunities to improve the extent to which public sector funding is used to leverage the finance and investment flows needed to reap the full benefit of a transition to a lower-carbon, efficient, job-creating, equitable and competitive economy as envisaged in the NCCRP.

Table 6 provides a framework for reflecting on the operationalisation of the Near-term Priority Flagship Programmes and **Table 7** provides a high level reflection on various aspects of these programmes to date.

Table 6: Framework for reflecting on the operationalisation of the Near-term Priority Flagship Programmes

Key Concept	Indicator	Description	
Flagship Approach	Climate action leadership function	• Self-identification and branding as a National Climate Change Response Near-term Priority Flagship Programme in key departmental planning and communication products.	● Consistent reference made in various communication products (government-wide; departmental and popular media). ● Occasional reference made in various communication products. ● No reference made in any communication products.
	Communication and marketing	• Communication on programme implementation and profiling the climate and sustainable development benefits arising from implementation of the programme - Frequency: annual basis or more frequently - Extent: nationally and internationally - Variety of media products and platforms: Departmental strategies, reports, websites and other communication products or media platforms, popular media and research publications.	● Regular communication at Flagship Programme level (annual basis or more frequently) through a variety of media products and platforms, nationally and internationally. ● Occasional communication on Flagship Programme components (once a year or less) through a variety of media products and platforms, nationally or internationally. ● No communication products developed for the Flagship Programme as a whole nor for programme components.
Programme Approach	Consolidated Near-term Priority Flagship Programme implementation strategy	• Business case in the context of South Africa's national climate change response policy and objectives. • Detailed integrated plan (covering all programmes components) with implementation milestones and timeframes developed and documented.	● Consolidated Near-term Priority Flagship Programme implementation strategy developed. Programme components are integrated into a single master schedule. ● Departmental strategy developed that covers all flagship components in an integrated way but does not identify the strategy as a Flagship Programme strategy. Climate success metrics identified, defined and documented. ● No national strategy or strategies covering the Flagship Programme components. A fragmented view of the Flagship Programme where components are covered in different strategy documents without providing an integrated view of the Flagship Programme as a whole.
	Climate Change monitoring and evaluation	• Anticipated climate outcomes and benefits analysed, defined and documented. • Climate metrics identified, defined and documented and included as key programme success metrics.	● Climate change metrics identified, defined and documented and included as key programme success metrics. ● Some climate change metrics identified or defined in broad or qualitative terms. ● No climate change metrics identified or defined.

Table 6 continued...

Key Concept	Indicator	Description	
Programme Approach	Programme organisation	• Programme organisation defined, mandated, documented and operationalised. • Programme governance structure defined and documented. • Programme manager/coordinator mandated/ appointed. • Programme co-ordination steering committee terms of reference drafted and committee established.	● Defined and documented programme governance structure and mandated programme manager/coordinator; and project owners for each project component. ● No mandated programme manager/ coordinator for the Flagship Programme as a whole but some identifiable focal points for different programme components. ● No mandated programme manager/ coordinator.
	Programme reporting	• Reporting on programme implementation and climate change to the Inter-Ministerial Committee on Climate Change (IMCCC) and the Inter-Governmental Committee on Climate Change (IGCCC).	● Regularly: more than once a year over the lifetime of the programme. ● Occasionally: once a year over the lifetime of the programme. ● Rarely: less than once a year over the lifetime of the programme.
	Programme architecture	• Programme architecture defined, mandated, documented and operationalised. • Projects within the programme identified, defined and documented. • Outline and mapping of how the projects within the programme will deliver climate and broader sustainable development benefits.	● Programme and project scope, geographic location and implementation boundaries are well-defined and documented. Component projects are clearly and consistently named and easily identifiable as belonging to the Flagship Programme. ● Programme and project scope, geographic location and implementation boundaries are partially defined. Component projects are sometimes identifiable as belonging to the Flagship Programme. ● Programme and project scope, geographic location and implementation boundaries are not defined.

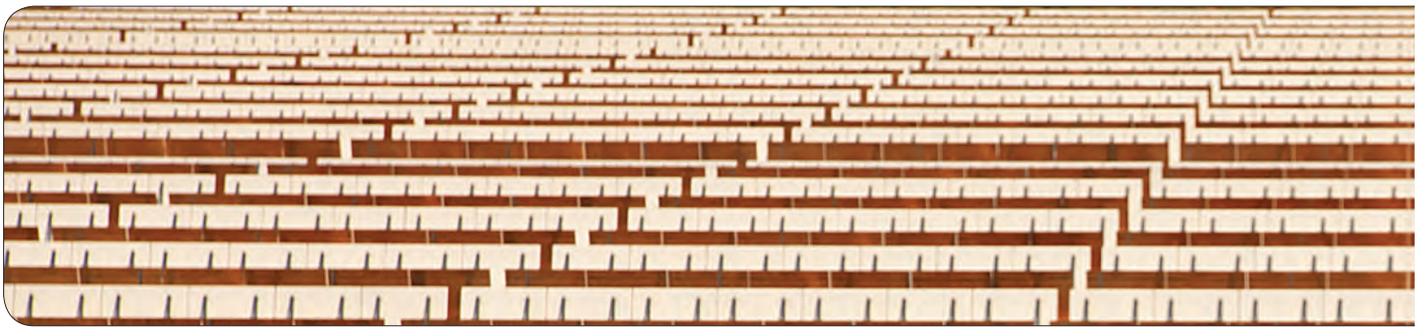
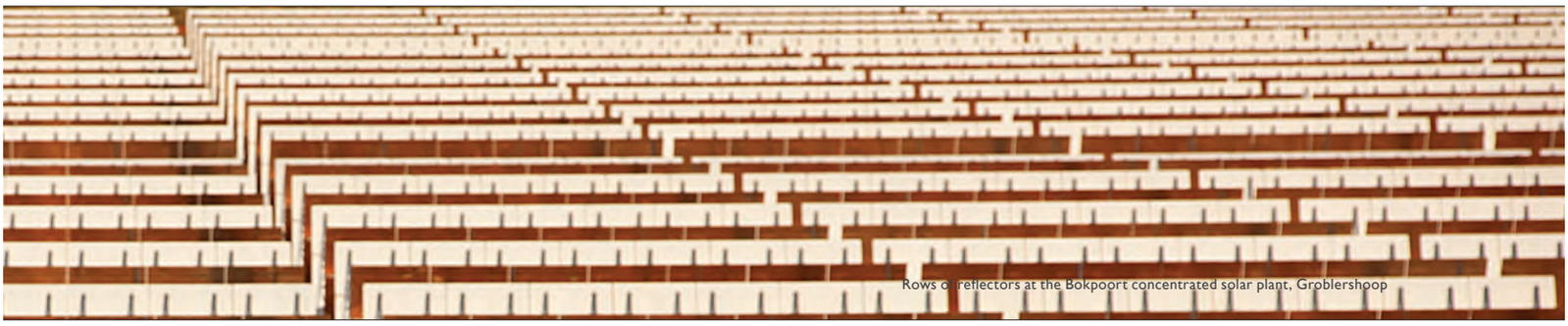


Table 7: Reflecting on the operationalisation of the Near-term Priority Flagship Programmes

Near-term Priority Flagship Programme	Flagship approach			Programme approach			
	Climate action leadership	Communication and marketing	Climate change M&E	Consolidated strategy	Programme organisation	Programme reporting	Programme architecture
The Climate Change Response Public Works Flagship Programme	🔴	🔴	🟠	🔴	🟠	🔴	🔴
The Water Conservation and Demand Management Flagship Programme	🔴	🔴	🟠	🔴	🟠	🔴	🔴
The Renewable Energy Flagship Programme	🔴	🔴	🟠	🟠	🟠	🔴	🔴
The Energy Efficiency and Energy Demand Management Flagship Programme	🟠	🔴	🟠	🟠	🟠	🔴	🔴
The Transport Flagship Programme	🔴	🔴	🟠	🟠	🟠	🟠	🟠
The Waste Management Flagship Programme	🟢	🟢	🟢	🟢	🟢	🟢	🟢
The Carbon Capture and Sequestration Flagship Programme	🟢	🟢	🟢	🟢	🟢	🟢	🟢
The Adaptation Research Flagship Programme	🟢	🟢	🟢	🟢	🟢	🟢	🟢



Rows of reflectors at the Bokpoort concentrated solar plant, Groblershoop

Key Messages

- The eight Near-term Priority Flagship Programmes are currently made up of 39 distinct components that can be regarded as sub-programmes, each of which can be disaggregated further into distinct measures.
- Many components of the Flagship Programmes have been implemented with notable success and signify remarkably bold steps towards a low carbon and climate resilient economy and society.
- The seeds for remarkable and bold transformative action have been sown. What is required now is a shift in focus to concrete mitigation and adaptation actions that are substantial, scalable and replicable.
- There are several critical improvement areas for Flagship Programmes going forward which can be addressed by ensuring the following:
  - Clearly defined and identifiable governance structures operating at an appropriate level to enable coordinated programme implementation.
  - Establishment of a common set of visible and easily understandable processes to put into operation each flagship programme as per the programme plan of action informed by the NCCRP.
  - An easily identifiable focal point and programme coordinator for each Flagship Programme, located at a sufficiently strategic level to have a holistic overview of each Flagship Programme and able to coordinate the different programme components.
  - Self-identification, branding and communication of the respective programmes' components, as belonging to Near-term Priority Flagship Programmes.
  - The inclusion and communication of climate change as a key programme success metric.
- Flagship programmes are funded primarily through public funds but are increasingly making use of different funding mechanisms as they have managed to leverage private and international climate finance.
- There are opportunities to improve the extent to which public sector funding is used to leverage finance and investment flows needed to scale up South Africa's climate change response.

4. SCALING UP SOUTH AFRICA'S CLIMATE ACTION

4.1 Flagship Programme Criteria

Section 1.2 of this theme provides a description of generic characteristics of a Near-term Climate Change Flagship Programme. The DEA, working through the Flagship Programmes Steering Committee, is in the process of formally recognising new climate change flagships.

To this end, the following characteristics have been identified for a climate change response measure to be recognised as a Flagship Programme:

- Be of national significance or impact, or have a national geographic footprint.
- Fall under government oversight.
- Have in place a well-defined institutional structure.
- Bring together projects/components that are aligned to a programme vision that, when implemented jointly, will have a clearly quantifiable impact on South Africa's greenhouse gas emissions, and/or a clearly quantifiable/qualifiable (in terms of the criteria set out in **Figure 15**) impact on South Africa's adaptation to current and expected future impacts of climate change.
- Include projects that can be implemented within five years of receiving Flagship Programme status.
- Have monitoring, evaluation and consolidated reporting of the primary climate change outputs/outcomes of the projects as an integral part of the programme, with reporting on an annual basis.

A detailed description of the Flagship Programme Criteria and guiding principles is provided in **Figure 15**.

Solar street lights at Doornkop, Steve Tshwete Municipality

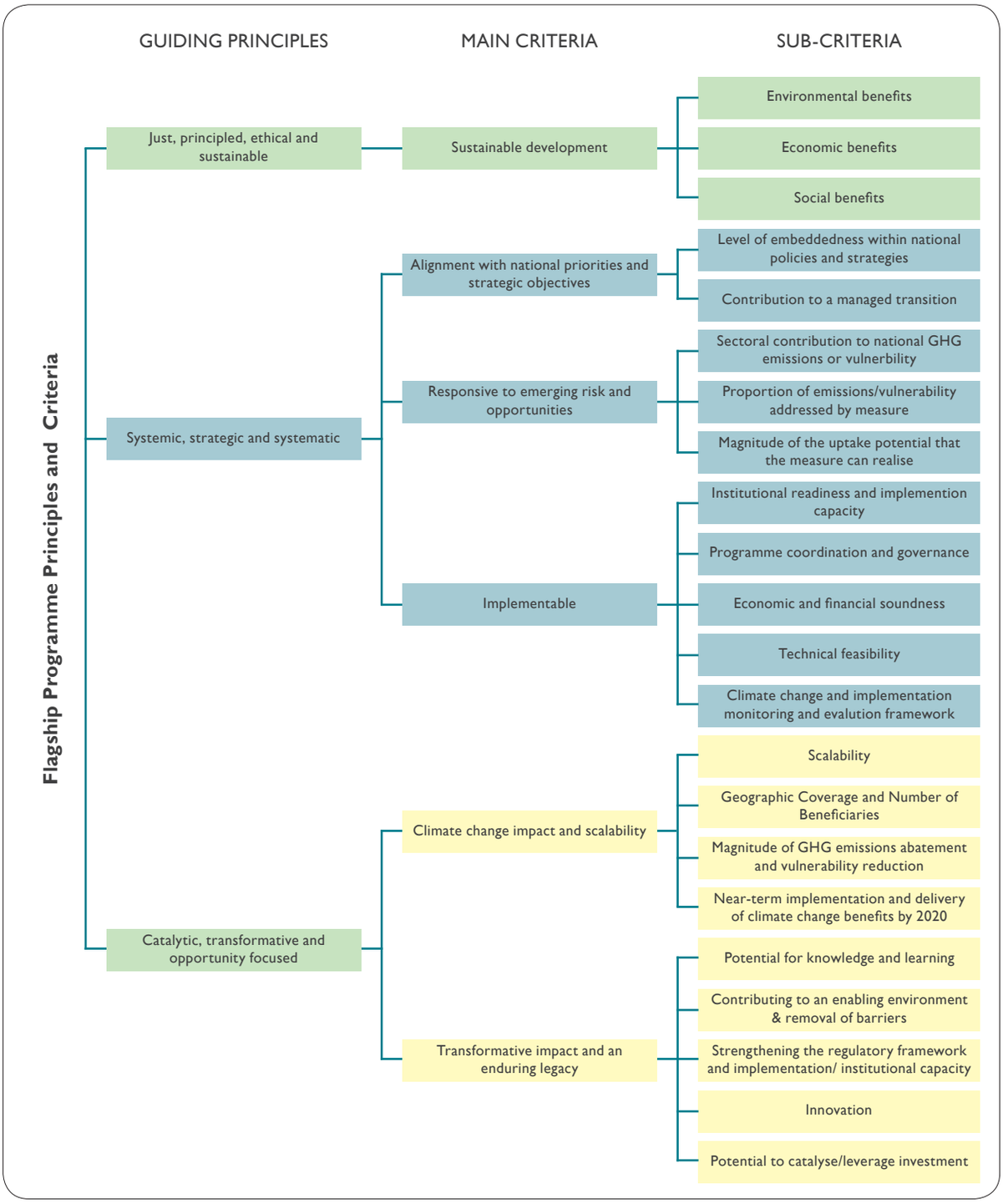


Figure 15: Climate change Flagship Programmes evaluation criteria and sub-criteria

4.2 Flagship Programme Priority Areas

The current approach to implementing and scaling up Near-term Priority Flagship Programmes in the run up to 2020 recognises the importance of both adaptation and mitigation as critical to South Africa's climate change response. Adaptation, in particular, has become increasingly recognised as a central component of South Arica's climate change response, as evidenced in the prominence of adaptation in South Africa's INDC. This speaks to the significant level of historical and future investments in this aspect of the national climate change response.

In this regard, the priority areas for the scaled-up implementation of Near-term Priority Flagship Programmes up to 2020 include an expanded list of adaptation focused measures. These have a greater emphasis on cross-cutting measures which leverage both the mitigation and adaptation benefits arising from implementing a set of actions. The focus areas for the call for new climate change Flagship Programmes are shown in **Figure 16**.

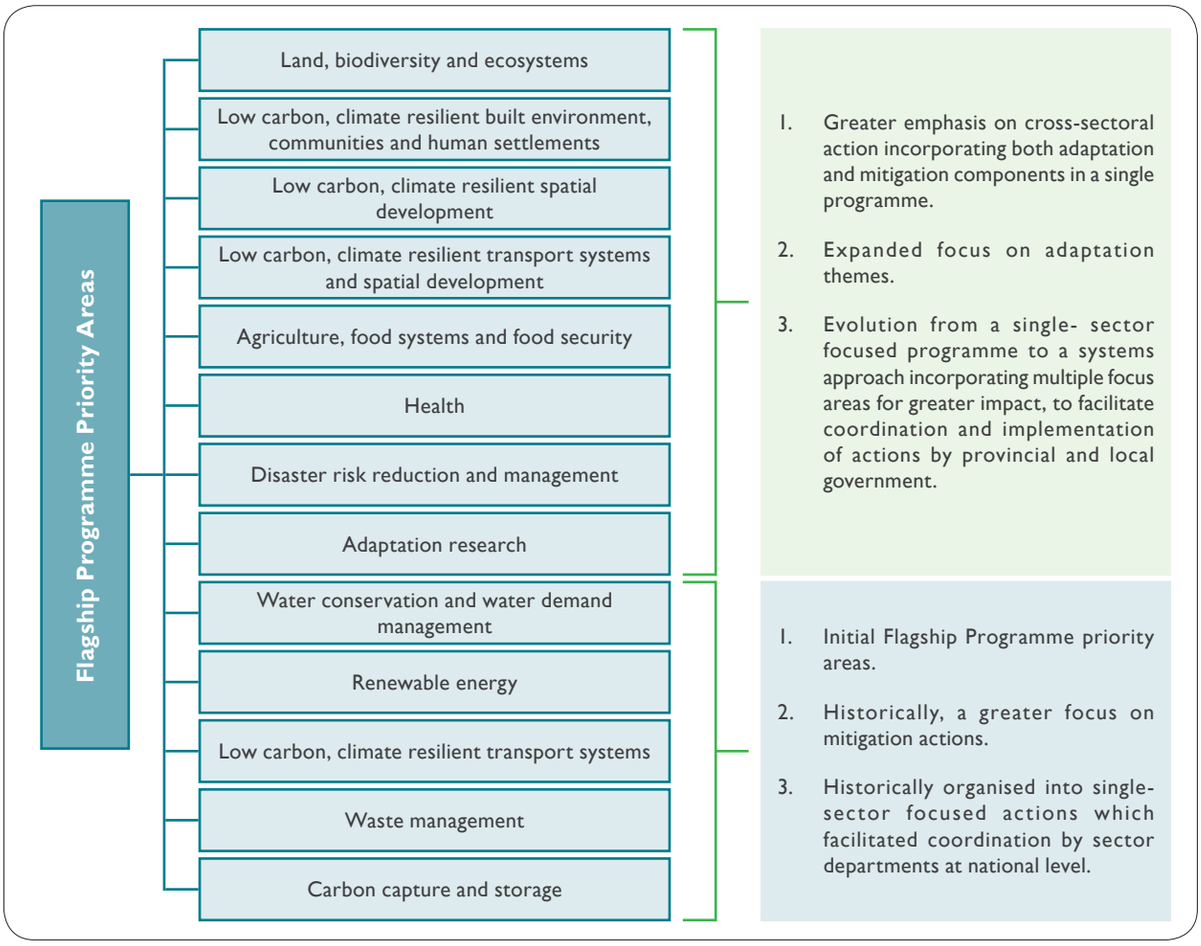


Figure 16: Climate change Flagship Programmes thematic areas

4.3 Building Flagship Programmes

The Near-term Priority Flagship Programmes are built on three key concepts (**Figure 17**) as a basis for achieving South Africa's climate change response objectives:

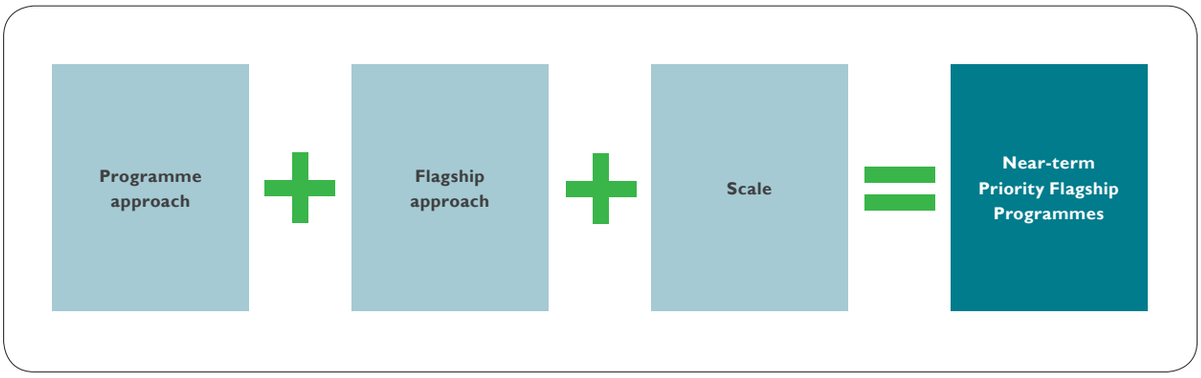


Figure 17: Key concepts underpinning the Near-term Priority Flagship Programmes

4.3.1 Programme Approach

A programme encompasses a series and set of related projects that in aggregate achieve an overarching set of objectives. A programme is considered to be a temporary flexible organisation set up to coordinate, deliver, or enable one or more benefits beyond the outputs or deliverables of any one constituent project or activity.[23]

In contrast, projects have specific and more singular objectives. Compared to traditional projects, programmes are more complex, wider in scope, strategic in nature and longer in duration.[24] In this sense, the difference is driven by scope and scale. Implementing a programme involves tackling large, complex change efforts that combine elements, new and changed business models, and overall changes to organisational structure and capabilities.

At project level, a Flagship Programme can include a single large project of national significance and/or many individual projects that alone, or jointly in the case of smaller projects, have significant climate change adaptation and/or mitigation impacts, and positive sustainable development impacts.

The grouping of projects under a single Flagship Programme may be as a consequence of being:

- housed in a single line department, and/or
- related to a single thematic area and/or
- suited to implementation through a coordinated approach

One line department can be involved in more than one Flagship Programme. For example, the DoE is involved in

23 Department for Business Innovation and Skills. *Guidelines for Managing Programmes: Understanding Programmes and Programme Management.* (London: BIS, November 2010). Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/31978/10-1256-guidelines-for-programme-management.pdf (accessed 10 May 2016)

24 P. Lehtonen and M. Martinsuo. Change program initiation: Defining and managing the program - organization boundary. *International Journal of Project Management* 26, 1 (2008) 21–29.

both the Renewable Energy and the Energy Efficiency and Demand Management Flagship Programmes.

Projects can only be included under one Flagship Programme. Projects that are eligible for inclusion under a Flagship Programme can range from large-scale projects to small local projects that can be rolled out to other locations.

A mechanism is required to monitor climate change adaptation and/or mitigation and sustainable development impacts of individual projects. The path to scaling of projects needs to be clear. In other words, the approach to a single project or a series of projects being expanded to achieve significant mitigation or adaptation impacts must be clear. For example, bus rapid transit (BRT) systems in one city may be expanded significantly in a single city, or the approach to implementing BRT in one city may be adopted in other cities.

The relationships between portfolios, programmes and projects are shown in **Figure 18**.

4.3.2. Scale

Scaling up, in the context of climate change Flagship Programmes, means taking successful projects, programmes, or policies and expanding, adapting, and sustaining them in different ways over time for greater development impact.[26]

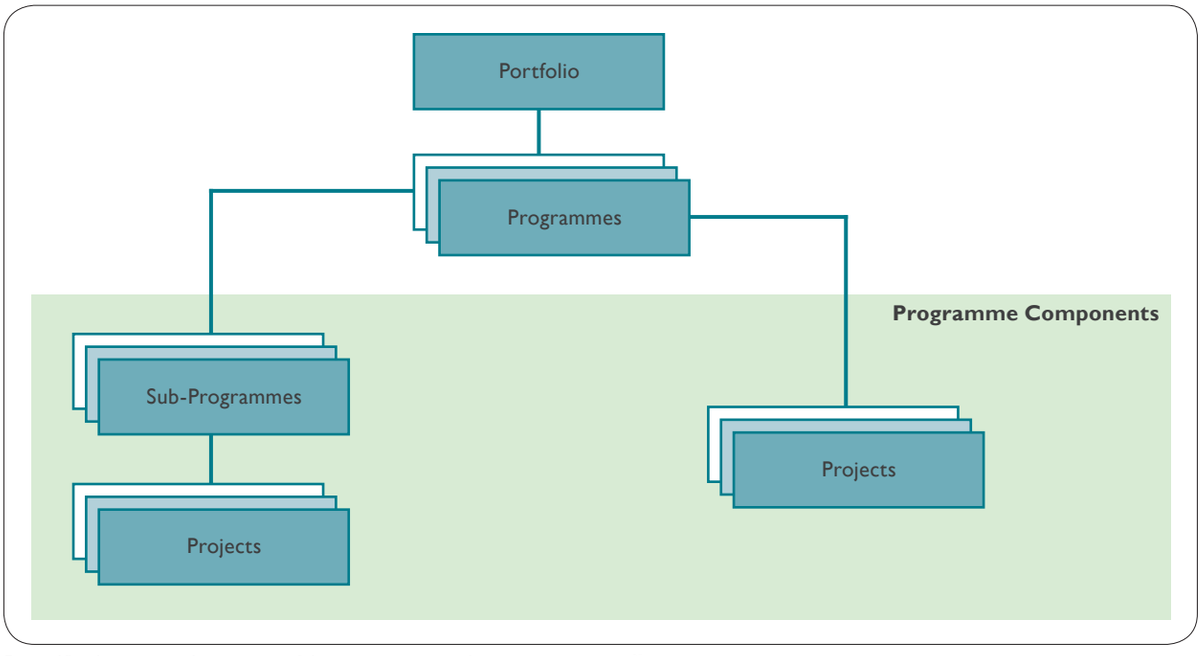


Figure 18: Interactions between portfolios, programmes and project management[25]

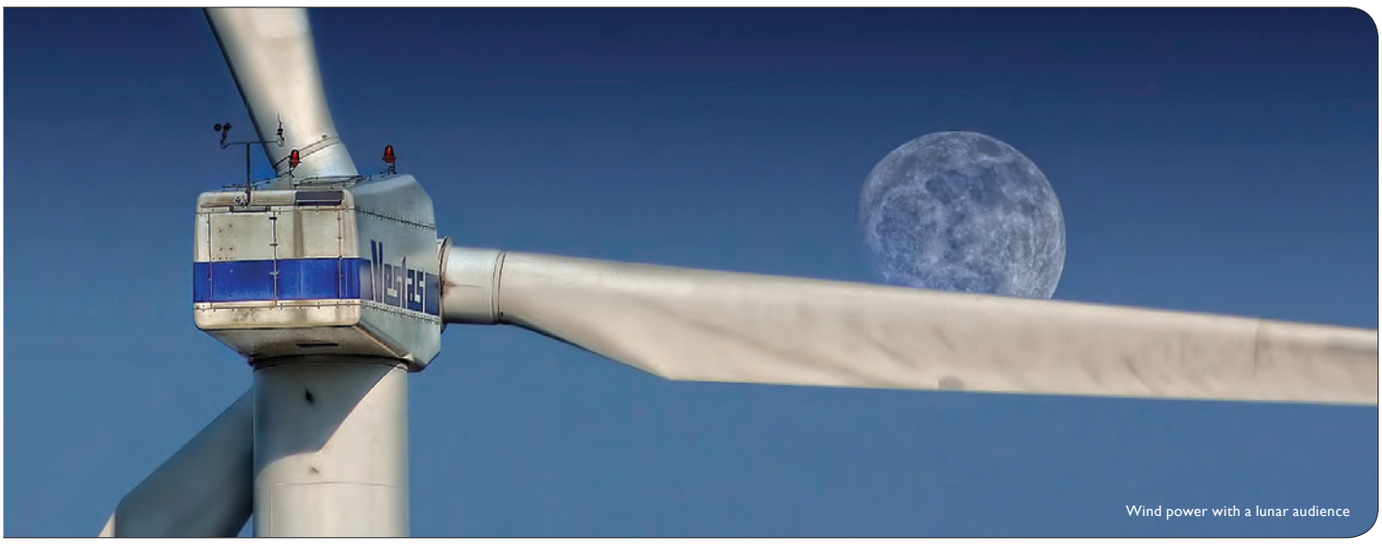
25 Project Management Institute. *A guide to the project management body of knowledge: (PMBOK guide), 5th edn.* (Newtown Square, Pa, Project Management Institute, 2013).

26 Arntraud Hartmann and Johannes F. Linn. *Scaling Up: A Path to Effective Development.* 2020 Focus Brief on the World's Poor and Hungry People. (Washington, DC: IFPRI, 2007).

There are different ways of thinking about scale and what achieving scale entails (**Table 8**).

Table 8: Approaches to scaling up Flagship Programmes

Dimension of scale	Description	Mechanism for scaling up
Quantitative	Growth or expansion and/or replication of existing measures.	• replication • adaptation
Functional	Increasing the level of coherence and the comprehensiveness of coverage of the programme components to increase the depth of impact.	• new dimensions/ new types of activities and programme areas • adding incentives or tools to reinforce existing components
Idea or innovation	Spreading an idea among individuals or organisations within a certain area or system (geographic, organisational, professional); ideas can be adapted to fit different purposes or contexts.	• communication • marketing • dissemination
Technology or skill	Increasing the number of people or places that use or apply a technology, practice, or approach.	• marketing • distribution • training
Policy	Moving towards institutional and structural changes – institutionalisation (mainstreaming). Ensuring that ideas expressed as policy are transformed into behaviour throughout a place.	• implementation



Wind power with a lunar audience

Scaling up typically involves working on several fronts at once and making a number of strategic choices, including about the nature and number of the interventions being scaled up; the roles of various partners; and the equity, financing, speed and sequencing of scaling up.[27]

4.3.3 The Flagship Approach

The term "flagship" is not limited to the Near-term priority programmes, but is a widely used and commonly understood term. Flagships are initiatives that take on strategic importance in a particular area of focus and are generally established for the specific purpose of leading change.[28] Thus a Flagship Programme is a game-changer, one that leads transformation in any particular area.

Flagship programmes are highly prominent, influential and catalytic in nature (**Figure 19**).

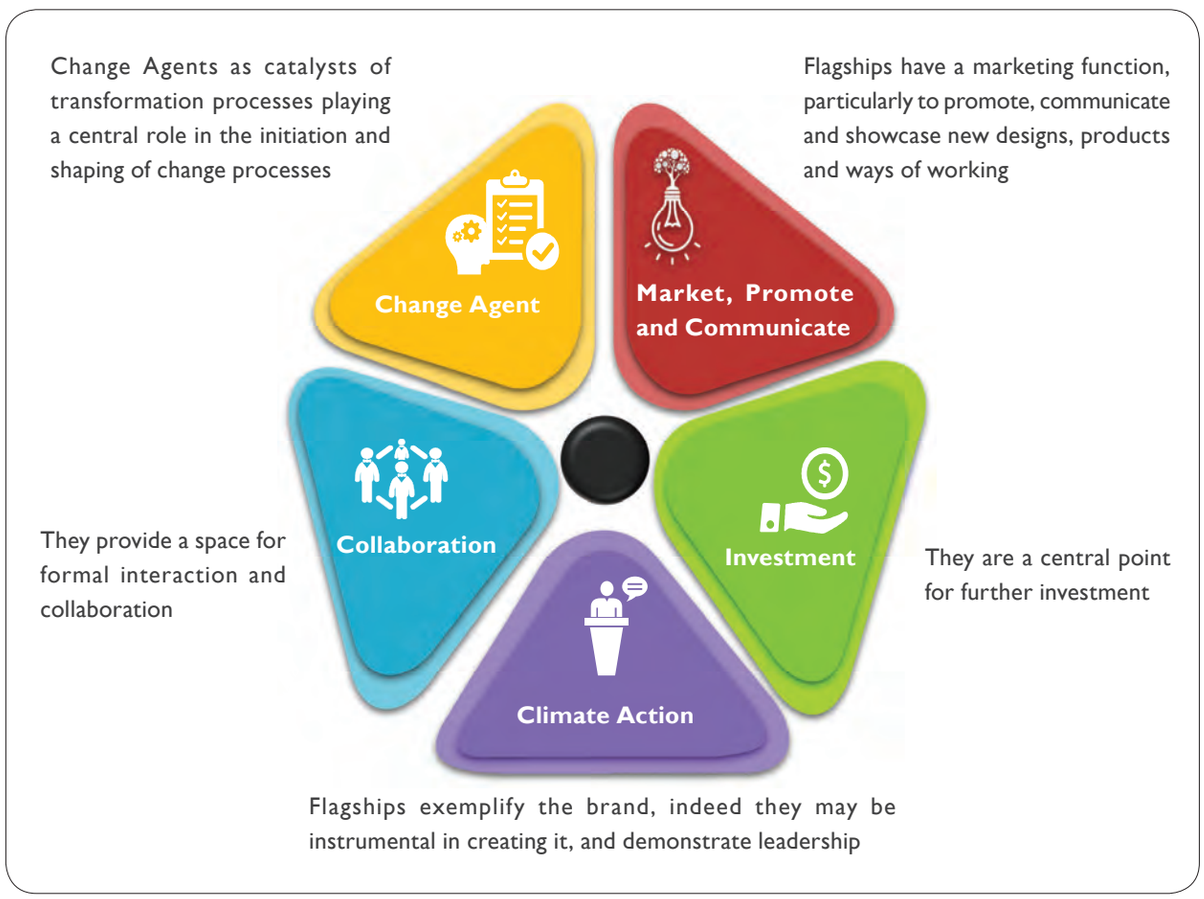


Figure 19: Understanding the flagship concept

27 WHO *Scaling Up Health Services: Challenges and choice.* (Geneva: WHO Technical Brief No.3 - Draft 3, 12 June 2008). Available at: http://www.who.int/healthsystems/topics/delivery/technical_brief_scale-up_june12.pdf (accessed 10 May 2016).

28 A. Rugman and D' Cruz. The Theory of the Flagship Firm. *European Management Journal*, Volume 15, 4 (1997) : 403–412

4.4 Operationalising Implementation and Scale

4.4.1 Process for proposing and approval of a climate change Flagship Programme

The process for proposing and approving a Flagship Programme is shown in **Figure 20**.

The following are the main incentives for participating in the Flagship Programmes:

- Elevation to the status of national climate change Near-term Priority Flagship Programme and formal recognition as such, nationally and internationally.
- Profiling as a national climate change Near-term Priority Flagship Programme nationally and internationally.

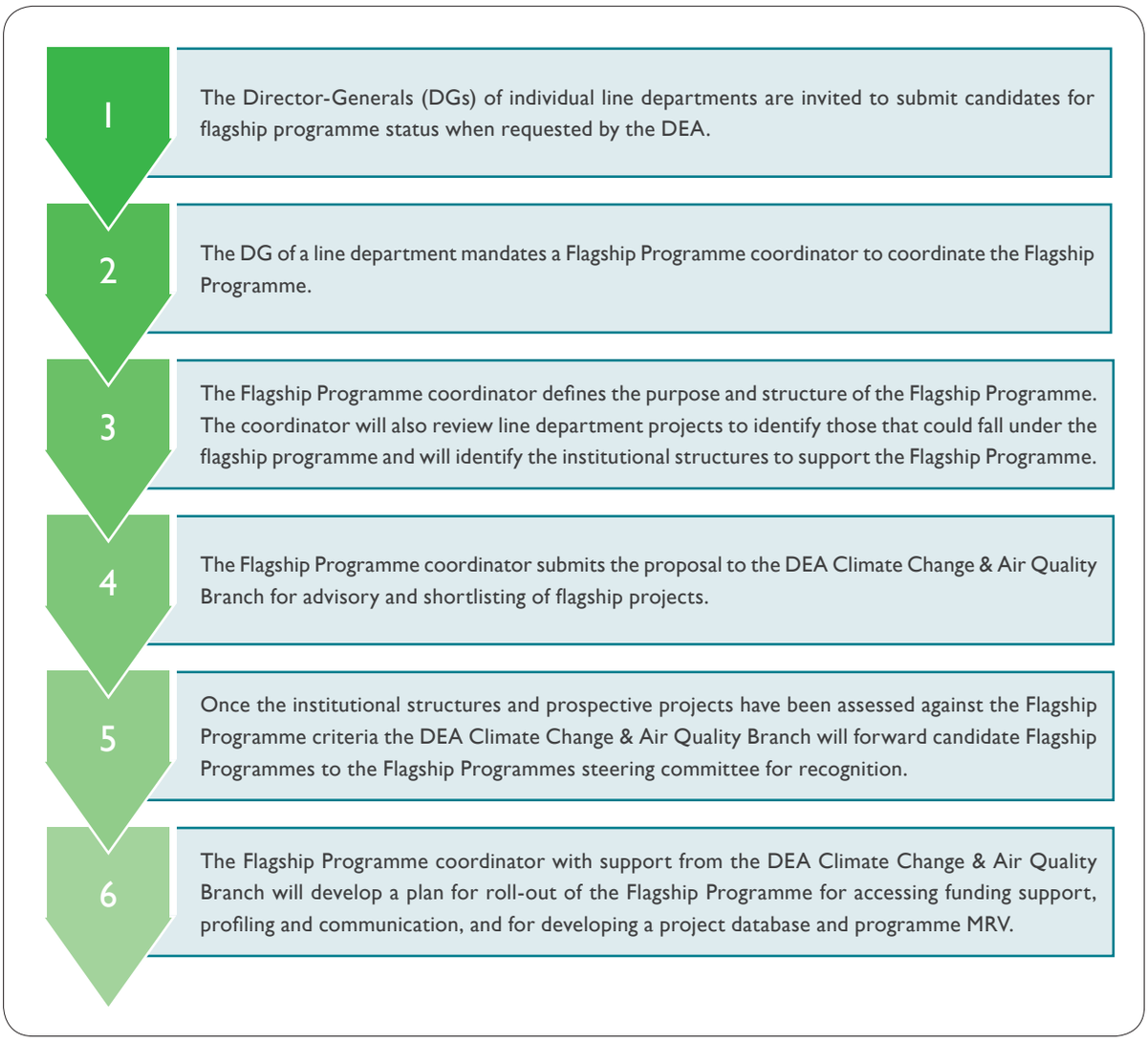


Figure 20: Process for proposing and approving a Flagship Programme

A Re Yeng, bus rapid transport system in Tshwane

- Potential for dedicated advisory and technical support in developing programme/project proposals and packaging them into bankable measures; accessing funding and climate support mechanisms.
- International and national recognition through South Africa's reports on climate change to the UNFCCC and domestically.
- Technical support for determining climate change M&E in the programme/project.

The Flagship Programme coordinator with support from the DEA Climate Change & Air Quality Branch will develop a plan for rollout of the Flagship Programme including accessing funding support, profiling and communication, and developing a project database and programme MRV.

4.4.2 Coordination of the Near-Term Priority Flagship Programmes

Implementing and scaling up the Near-term Priority Flagship Programmes responds to the urgent need for climate action in South Africa before 2020. Action to date has focused on putting in place the key building blocks for enabling climate action at scale.

The key outputs during this period include the establishment of an overarching governance structure for the Flagship Programmes and the development and piloting of programme preparation models for implementation for two sectors: energy efficiency and waste management. This period has also seen the integration of the Flagship Programmes and NAMA development, and the establishment of the coordination process to enhance impact and efficiency through the Flagship Programmes Steering Committee.

The objectives of the Flagship Programmes Steering Committee are as follows:

- Enhancing cooperation and collaborative action among all spheres of government, designated agencies and other stakeholders in the roll out and upscaling of the Climate Change Near-term Priority Flagship Programmes.
- Providing general strategic direction to develop and scale up implementation of the Near-term Priority Flagship Programmes.
- Streamlining project/programme pipeline processes with the aim of realising opportunities and accessing resources that will leapfrog South Africa towards her vision.

- Development of a funding and support mechanism for scaling up the Flagship Programmes.
- Facilitating the development/enhancement of a climate change monitoring and evaluation mechanism for the Flagship Programmes that will be implemented to monitor progress.
- Profiling the climate change flagships and developing a communication strategy for profiling flagships, drawing on information provided to the climate change M&E system, among other sources.

4.5 Key role players in Implementing and Scaling up the Near-Term Priority Flagship Programmes

4.5.1 The role of Flagship Programme Coordinator

All three spheres of government play important roles in addressing climate change. The NCCRP indicates that line function national departments will manage Near-term Priority Flagship Programmes to build climate resilience. Climate change is a concurrent function between provincial and national government. In the context of the Flagship Programmes, provinces are expected to coordinate provincial adaptation and mitigation responses across their own line departments, as well as among municipalities within the province.[29]

The Flagship Programme coordinators sit in national government departments and are the points of contact for individual Flagship Programmes. The programme coordinators are responsible for identifying projects, channelling support requirements and collating project and MRV data and undertaking the following activities:

- Coordinating the development of a Flagship Programme, including the programme's scope and boundary, programme architecture and components and the governance structures and institutional arrangements.
- Coordinating the development of the flagship framework with the following elements, a:
  - programme for implementation
  - detailed analysis of mitigation or adaptation outcomes expected to result from the programme
  - proposal for realising local sustainable development benefits, including employment, poverty alleviation, industrial development, reduction in local air pollution and other relevant issues
  - well-defined reporting format that will include a set of relevant indicators, and a proposal to establish an annual reporting process
- Identifying projects or groups of projects that meet Flagship Programme criteria within their line department/s and getting the department's approval.

4.5.2 The Role of Flagship Project Owner

The project owner sits within national government and is responsible for ensuring that the project is rolled out, and/or represents the government department within the governance structure of a project. A sub-project owner may also be found at the provincial or local government level or in another governmental position. The project owner may or may not be the same person as the project implementer, who is responsible for the day-to-day operation of the project.

The project owner undertakes the following activities:

- One project owner may oversee a number of similar projects being implemented by different implementers. The project owner may or may not

29 Republic of South Africa. *National Climate Change Response White Paper.*

be the same person as the project implementer, who is responsible for the day-to-day operation of the individual project(s).

- The project owner needs to put in place the structures related to communication and coordination regarding all matters related to the Flagship Programme.
- The project owner must ensure that flagship MRV reporting requirements are embedded in the monitoring systems of projects and is responsible for reporting to the Flagship Programme coordinator. Support on developing and implementing MRV systems can be provided by the Climate Change Branch at the DEA.
- The project implementer is responsible for collating climate change and sustainable development data for individual projects and providing this data to the project owner
- The project owners and implementers are required to send relevant promotional material to the Flagship Programme coordinators to use for promoting the specific Flagship Programme and for passing on to the Climate Change Branch at the DEA.

The DEA's role in implementing and scaling up the Flagship Programmes is discussed in more detail below.

Figure 21 provides an overview of the institutional structure and functional roles for the Flagship Programmes.

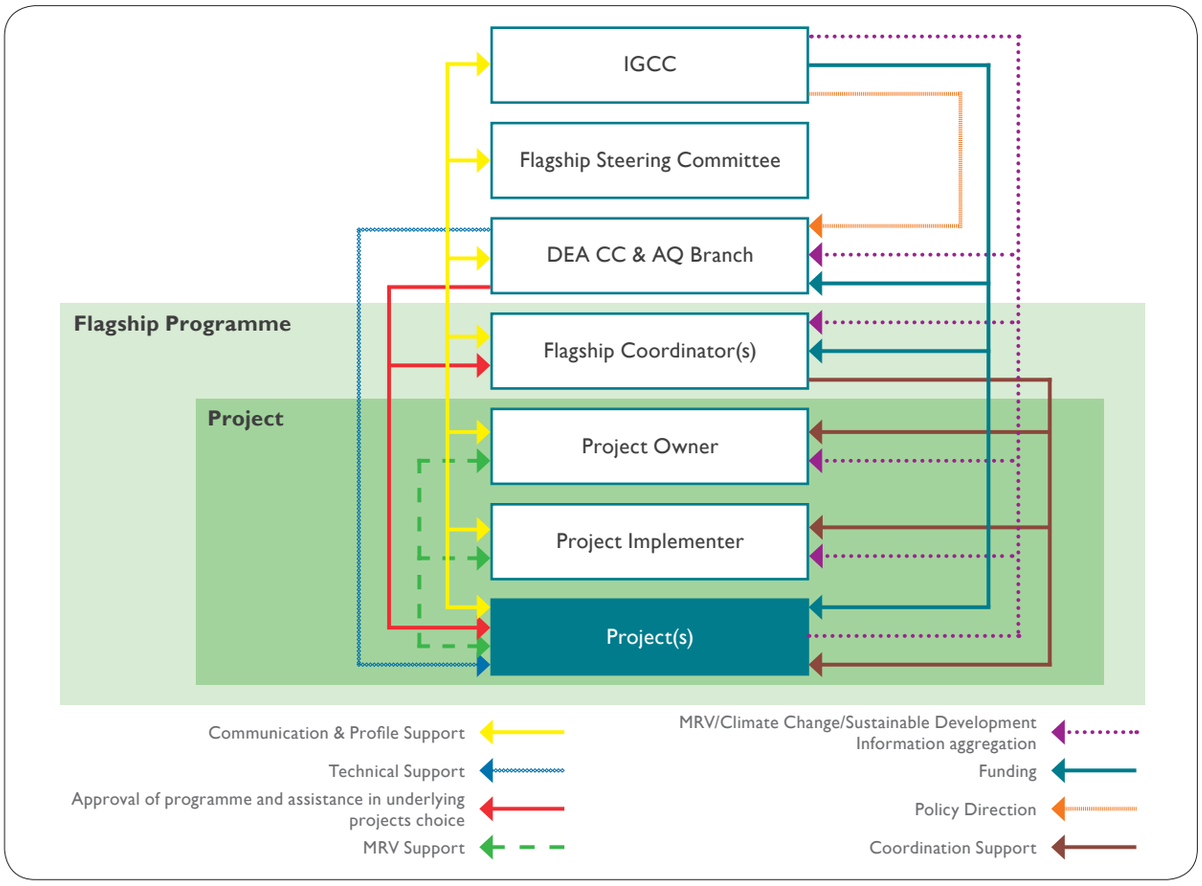


Figure 21: Overview of the institutional structure and functional roles for the Flagship Programmes

Staff at De Aar Solar Power, De Aar

4.5.3 The Role of the Department of Environmental Affairs

Policy maker and facilitator are the traditional roles the DEA has played in the climate change space. Up until recently, the DEA has not been required to go beyond these roles into managing change across a range of sectors or even playing an integral role in the actual implementation of programmes.

The key question here is why, and how, has the DEA's role evolved in South Africa's climate change response and where do the Near-term Priority Flagship Programmes fit within that evolution?

Over time, there has been a logical evolution for the DEA from that of mainly a policy maker developing and providing overall strategic direction in the implementation of South Africa's climate change response, to a more defined role in enabling change to take place by providing the support and leadership required by the sector leaders who are the true champions of change within their respective sectors and areas of focus.

The National Climate Change Response Policy framework has matured substantially since 2005, evidenced by the development of the NCCRP, also referenced in the NDP as South Africa's overarching framework and, more recently, a move towards a Climate Change Act. There has been a marked emphasis on implementation, manifesting as translation of policy into detailed action and effecting visible change.

The DEA, supported by international donors, is expanding its climate change team and has brought in additional personnel to focus specifically on supporting and enabling implementation of the national climate change response set of policies and other policies relevant to South Africa's climate change response.

The DEA's Flagship Unit, the Climate Change and Air Quality Branch, works under the leadership of the Chief Directorates for Mitigation, Adaption, Climate Change Monitoring and Evaluation and for International Climate Change Relations and Negotiations. The key role of the Flagship Unit is to support Flagship Programme coordinators in the implementation and scaling of the Flagship Programmes. This work includes supporting the process of approval of the Flagship Programmes, providing overall support to individual Flagship Programmes in response to requests (including supporting access to funding and communication/profiling), developing a pipeline of investment-grade climate change response programmes and projects and documenting progress in implementing the different Flagship Programmes. The unit is positioned as a change agent. A change agent is an individual or group undertaking the task of stimulating, facilitating, and coordinating the change effort within an organisation.[30]

30 Lunenburg, F.C. Managing Change: The Role of the Change Agent. *International Journal of Management, Business, And Administration*, 13, 1 (2010) p1.

Figure 22 provides an overview of DEA's role in the implementation and scaling up of the Flagship Programmes.

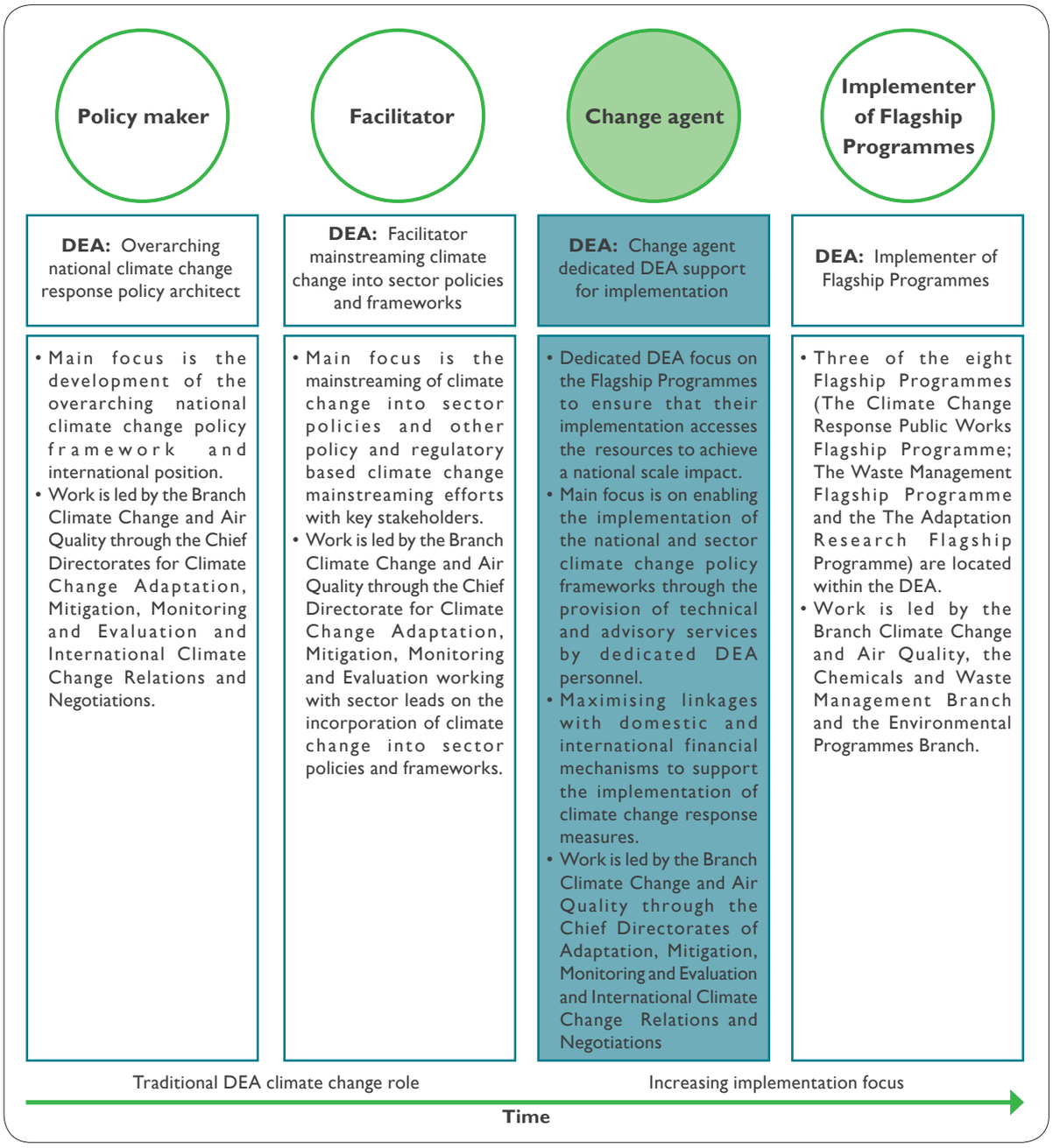


Figure 22: DEA's changing role over time

Key Messages

- There are three main drivers for the full implementation and scaling up of the Near-term Priority Flagship Programmes:
  - Insufficient climate action and ambition to limit global warming to 2°C internationally and South Africa's mitigation gap.
  - Heightened need for extensive national adaptation measures.
  - Dynamic and inclusive approach to scaling up South Africa's climate change response.
- The current approach to the Near-term Priority Flagship Programmes recognises the importance of both adaptation and mitigation as critical to South Africa climate change response and therefore includes more adaptation priority areas.
- Adaptation has become increasingly recognised as a central component of South Arica's climate change response.
- The Near-term Priority Flagship Programmes provide support to the implementation of projects or groups of projects that have climate change adaptation and/or climate change mitigation impacts.
- The Near-term Priority Flagship Programmes are of national significance and impact or geographic footprint, are led or sponsored by government and are implementable by 2020.
- All three spheres of government play important roles in addressing climate change and action must be coordinated:
  - National departments are mandated to coordinate Flagship Programmes.
  - Provinces are expected to coordinate provincial adaptation and mitigation responses across their own line departments, as well as between municipalities within the province.
- A governance and coordination structure for Flagship Programmes has been established comprising key implementation role players within government.
- Monitoring, evaluation and consolidated reporting of the primary climate change outputs/outcomes of the projects is an integral part of the programme, with reporting on an annual basis a key component.
- A process for identifying, developing and operationalising Flagship Programmes has been established.
- Dedicated capacity for supporting the implementation and scaling of Flagship Programmes has been established at the DEA.

5. THE NEAR-TERM PRIORITY FLAGSHIP PROGRAMMES: CONCLUSION

The Near-term Priority Flagship Programmes are integrative at heart, seamlessly linking South Africa's national climate change response, development agenda and vision, and the global climate change policy framework and associated efforts. The Flagship Programmes integrate the actions of different spheres of government and other key stakeholders in the private sector and civil society to achieve collective climate impact.

The Flagship Programmes provide a single cohesive and consistent narrative of South Africa's climate change response and showcase the maturation and growth in South Africa's climate change response ambition, capacity, and expertise over time. In this way the Flagship Programmes have a continuity function and demonstrate South Africa's long-standing commitment to sustainable economic growth and social development.

The Near-term Priority Flagship Programmes provide the necessary infrastructure to enable climate action at scale:

- Enabling a progression from single-project based climate action to programmes that have an economy or sector-wide transformative impact.
- Strengthening governance structures for coordinating climate action thus contributing to increased institutional readiness.
- Embedding enabling structures (see **Section 2.4** and **Section 2.5** for the international policy context).
- Enabling greater transparency and communication using robust climate change monitoring, reporting and verification (MRV) and well-understood metrics, and providing dedicated support to programme developers and implementers.

The Flagship Programmes provide an easily recognisable and locatable focal point for attracting and leveraging investment from both the private and public sectors. In


Ready for planting

addition they focus investment in priority areas by clearly articulating investment needs and value underpinned by robust climate change MRV. Flagship Programmes seek to enhance access to resources. Key targets for achieving this include the Green Climate Fund (GCF), the UNFCCC's NAMA Registry facilitated opportunities and the NAMA Facility, among others.

The value of Near-term Priority Flagship Programmes to South Africa's overall climate change response is summarised in **Figure 23**.

Inherent in the programme function is prioritising and consolidating action in priority areas. The Flagship Programmes play a crucial role in consolidating South Africa's vast and increasingly complex climate change response landscape, and provide an organising framework for bold climate action using a more strategic approach driven by a clear vision. A more strategic approach to South Africa's climate action has the benefit of providing a bird's-eye view of what is often a fragmented landscape, enabling a good understanding of the drivers, key interlinkages, dependencies and opportunities of the various response measures to improve effectiveness and deepen climate impact.

The Near-term Priority Flagship Programmes have an enormous role to play in creating excitement around climate actions and in profiling South Africa's climate action successes to gain recognition for national investments to date, and to attract the additional resources required to drive increasingly ambitious climate action.

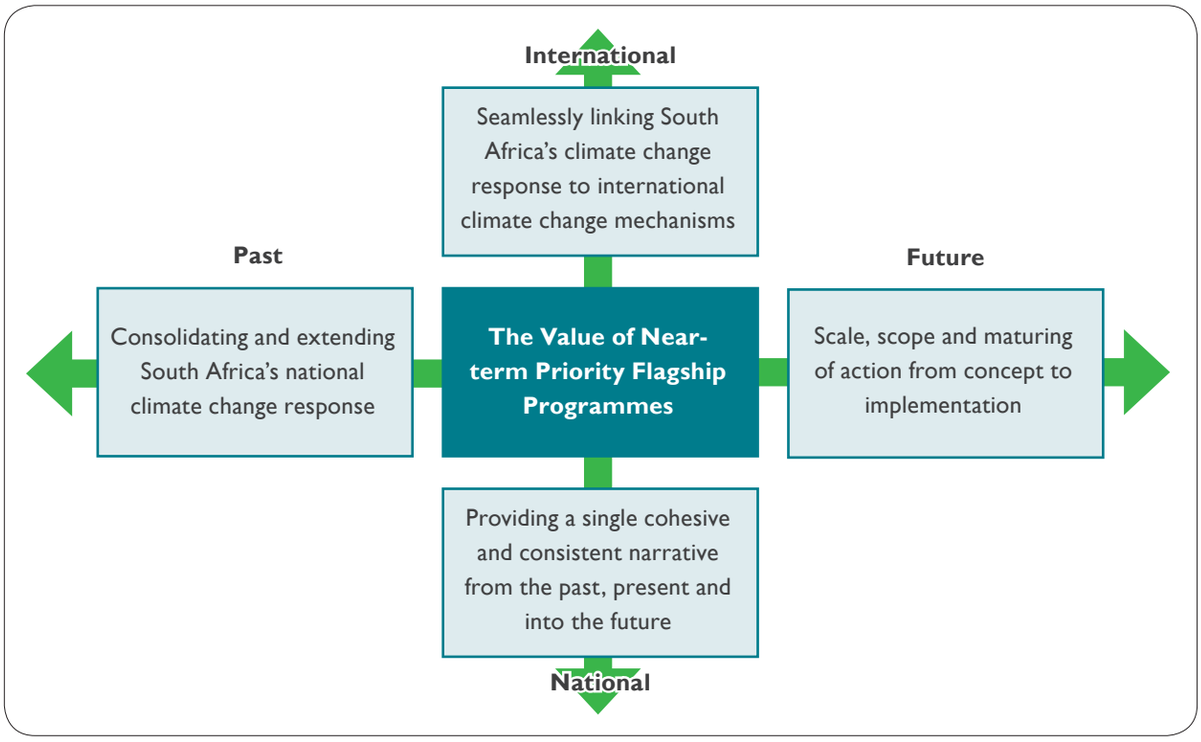


Figure 23: Understanding the value of Near-term Priority Flagship Programmes

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ANNEXES

ANNEXE I DETAILED OVERVIEW OF INDIVIDUAL NEAR-TERM PRIORITY CLIMATE CHANGE FLAGSHIP PROGRAMMES

The Climate Change Response Public Works Flagship Programme

What does the Programme Address?

The Climate Change Response Public Works Flagship Programme is one of the most complex and longstanding of the Flagship Programmes, made up of multiple component (sub) programmes which in themselves are massive undertakings. The Flagship Programme builds on the immense experience of the various measures implemented under the Expanded Public Works Programme (EPWP). The EPWP was introduced in 2003 to address severe unemployment through the creation of job opportunities in various sectoral programmes by re-orientating line function budgets and government expenditure to support job creation.[31]

South Africa's natural systems are under immense pressure due to increasing demand for resources and ecosystem services, and increased generation of pollution and waste. This has resulted in high levels of land degradation. Thus, the key aim of the Flagship Programme is to build and protect South Africa's natural resources and cultural heritage.

The broad programme objectives are as follows:

- protect, restore and preserve the physical environment and promote the green economy initiatives
- integrate sustainable rural development and urban renewal

The Flagship Programme is implemented using a variety of implementation arrangements. Some programmes are implemented by the national or provincial departments themselves. Others are implemented through partnership arrangements with other spheres of government or implementing agents, such as procured service providers, public entities or community based organisations.

What are the Programme Components and Key Activities?

Table 9 provides an overview of the components of the Climate Change Response Public Works Flagship Programme and **Figure 24** provides an overview of the programme implementation roadmap.[32]

31 Departments of Public Works and Environmental Affairs. *EPWP Phase III Environment & Culture Sector Plan 2014/15–2018/19: For the National Departments of Environmental Affairs and Public Works*. (Pretoria, Environmental Affairs and Public Works, June 2014.) Available at: https://www.environment.gov.za/sites/default/files/reports/epwpphase3environment_culturesector.pdf

32 Ibid.

Table 9: Components and key activities of the Climate Change Response Public Works Flagship Programme

Programme Component	Goal	Responsible Entity/ Owner	Main Activities
Working for Water	To improve the integrity of natural resources by managing the impact of established invasive alien species through labour intensive, mechanical and chemical control.	Department of Environmental Affairs (DEA)	• Preventing new and emerging invasive alien plant problems • Reducing the impact of existing priority invasive alien plants • Follow-up and annual maintenance control
Working for Wetlands	To enhance the restoration of ecological infrastructure through water flow management.	DEA (managed by the South African National Biodiversity Institute), and the Departments of Water and Sanitation (DWS) and Agriculture Forestry and Fisheries (DAFF)	• Removing invasive alien/undesirable plant species • Plugging artificial drainage channels and constructing structures (gabions, berms, weirs) to divert or redistribute water to restore its natural flow • Training and enterprise development/capacity building
Working for Land	To rehabilitate degraded land using indigenous as well as advanced technologies to increase its productivity.	DEA	• Land rehabilitation and tree planting • Gabion construction • Small scale removal/treatment of invasive shrubs, weeds or grasses
Working on Fire	To prevent and minimise the impact of wildfires.	DEA but is implemented by the FFA Group of Companies	• Prevention and control of wildfires • Implementation of integrated fire management, including supporting the development of the Fire Protection Association structures • Training and capacity building as veld and forest fire fighters
Working for Ecosystems	To have intact ecological infrastructure, goods and services.	DEA	• Restoration of watersheds, riparian zones and wetlands • Revegetation/restoration of degraded habitats and denuded land • Promotion of economic development in rural areas
Greening and Open Space Management	To enhance and provide access to open spaces for recreational purpose.	DEA	• Rehabilitation of parks and landscaping/planting of indigenous trees • Installation of irrigation systems, bore-holes and alternative energy sources • Development of Open Space Management Plans for municipalities

Table 9 continued...

Programme Component	Goal	Responsible Entity/ Owner	Main Activities
People and Parks	To invest in infrastructure development and biodiversity conservation for economic benefits, ensure that local communities are involved in the management of protected and surrounding areas and ensure the promotion of biodiversity values.	DEA	• Removal of alien invasive plants, rehabilitation of wetlands and degraded land and reforestation • Fire break management • Development/upgrading of infrastructure in/around protected areas • Supporting ancillary industries and SMME development initiatives
Working on Waste	To enable less waste that is better managed.	DEA	• Diversion of municipal waste from landfill sites for recycling • Construction of waste transfer stations, buy-back/recycling centres, material recovery facilities and composting facilities • Development of municipal integrated waste management plans
Working for the Coast	To create and implement programmes to ensure sustainable and equitable maintenance of the coast¬al environments.	DEA	• Removal of invasive alien vegetation • Rehabilitation of degraded areas • Cleaning of the coast and removal of illegal/abandoned structures
Working for Fisheries	To have fishing communities and individuals adopt ecologically sustainable approaches to the management of fisheries resources, while improving their livelihoods.	DAFF	• implementing an ecosystem approach for fisheries management • Implementing small-scale fisheries/community-based aquaculture • Marine anti-poaching measures and combating illegal/unregulated fishing
Comprehensive Agricultural Support Programme	To provide effective agricultural support services, to promote and facilitate agricultural development.	DAFF	• Financial, technical and advisory assistance, and regulatory services • Training, capacity building, marketing and business development • On-farm and off-farm infrastructure and production inputs
LandCare	To develop and implement integrated approaches to natural resource management that are efficient, equitable, and consistent with the principles of ecologically sustainable development.	DAFF	• Improving the ability of land users to manage their natural resources • Addressing the causes of environmental and resource degradation, • Demonstrating innovative approaches to natural resource management

2014 - 2019 **Phase 3**

- Focus on: income transfer and work opportunities, creating a common platform for all programmes, and streamlining M&E.
- Overall targets set at 1 151 504 million work opportunities and training adopted as a key component of projects.
- New projects initiated and replication of existing national programmes incentivising provinces as partners.
- Key focus areas include:
  - rural development, land reform programmes, land management strategies and services
  - green jobs including the integration of a greening programme with housing programmes and landscape rehabilitation integrated with community nurseries
  - municipal waste programmes linked to community contracting procurement
  - developing sustainable cooperatives in the process of promoting sustainable, land-based livelihoods.

2009 - 2014 **Phase 2**

- Main focus on increasing the number of job creation outputs, mobilising technical support, nongovernment participation and incentives for expansion.
- Formally-located, clear political and administrative accountability across all spheres of government.
- Mainstreamed programme criteria and outputs within the core mandates and work of implementing public bodies.
- Programme incentives introduced for different spheres and sectors including an earmarked budget allocation to national government departments and grants for implementation for provincial and municipal government departments.
- An expansion of the national programmes, and their provincial counterparts, an increasing number of activities implemented by local government agencies.

2004 - 2009 **Phase 1**

- Main focus on skills development, employment and exit opportunities; growing diverse sectors and work opportunities; and mainstreaming the programmes.
- During Phase 1 the programmes achieved the creation of 200 000 work opportunities; 2 005 000 total person days of training, clearing of over 200 000 [hectares, tons ?] of alien vegetation; supporting 20 fire protection associations and rehabilitation of over 10 000 hectares of land.
- The Working for Water programme contributed 40% to the sector's achievements in the main focus areas followed by LandCare, and also contributed to establishing Implementation capacity in the sector.

Figure 24: Climate Change Response Public Works Flagship Programme

The Water Conservation and Water Demand Management Flagship Programme

What does the Programme Address?

South Africa is a water-scarce and water-stressed country with annual average rainfall of less than 500 mm a year, compared with the world average of about 860 mm. South Africa is among the top 30 driest countries in the world and is prone to extreme rainfall fluctuations and erratic, unpredictable extremes in the form of droughts and floods. In addition to this, South Africa has a highly variable and low runoff rate, with only some 9% of rainfall reaching the rivers as runoff and in all but a few isolated areas the average annual potential evaporation is higher than the rainfall.[33]

This makes the country particularly vulnerable to climate change impacts on water security, and water is the primary medium through which the impacts of climate change are felt in South Africa.[34] South Africa is already experiencing water restrictions on a fairly large scale, exacerbated by one of the worst droughts to hit the region in the past 30 years. Current water usage already exceeds reliable yield, a situation which is likely to persist to 2030.[35] Analysis by the Department of Water and Sanitation's (DWS's) Water Authorisation and Registration Management System (WARMS) database indicates that total registered water usage has already reached the estimated 2025 high water requirement of 17.3 billion m^3/annum. South Africa's water resources are not distributed evenly and many rural settlements still have insufficient water resources to meet their basic water needs.

The National Water Resource Strategy of South Africa second edition (NWRS2), approved by Cabinet and published in the Government Gazette in August 2013, identifies the implementation of water conservation and water demand management (WCWDM) as a top priority and core strategy to ensure sufficient water to meet South Africa's social, economic and environment requirements.[36]

WCWDM refers to the minimisation of loss or waste of water through efficient and effective control of the supply of, and demand for, water. WCWDM is increasingly expected to play a crucial role in ensuring environmental sustainability, social equity and economic development.

Rainwater harvesting is defined as the concentration, collection and storage of rainwater for use either on-site or at a different location, immediately or at a later time.[37] Rainwater harvesting can augment conventional water sources and contribute towards more efficient use of water resources, particularly in rural areas. In such cases, rainwater harvesting can greatly increase agricultural productivity, improve food security and alleviate poverty.

The DWS piloted a domestic rainwater harvesting project in 2006 with the objective of improving food security

33 Department of Water and Sanitation. "Strategic overview of the water services sector in South Africa 2015: Version 4". (Prepared by The DWS Directorate: Water Macro Planning, Pretoria, 20 January 2015.)

34 Department of Water Affairs. *National Water Conservation and Demand Management Strategy 2nd Edition*. (Pretoria: Department of Water Affairs, 2013.)

35 C. Douglas (ed.). *Charting our water future: Economic frameworks to inform decision-making.* (Washington DC: 2030 Water Resources Group, 2009.) vii +185. Available at: http://www.mckinsey.com/client_service/sustainability/latest_thinking/charting_our_water_future

36 Department of Water Affairs. *National Water Resource Strategy: Water for an Equitable and Sustainable Future, second edition*. (Pretoria: Department of Water Affairs, June 2013.) Available at: https://www.dwa.gov.za/nwrs/LinkClick.aspx?fileticket=CIwWyptzLRk%3D&tabid=91&mid=496

37 K. Siegert. "Introduction to water harvesting: Some basic principles for planning, design, and monitoring water harvesting for improved agricultural production." (Proceedings of the FAO Expert Consultation, Cairo, 21-25 November 1993. Rome: FAO, 1994.)

in rural areas. This later became the national Rainwater Harvesting Programme.[38] The national Rainwater Harvesting Programme provides water storage tanks to improve food sufficiency and for other productive water uses with a continued focus on rural households and subsistence scale agricultural activities. Other institutions such as clinics, schools and hospitals have now been included as beneficiaries to some extent. The provision of rainwater harvesting tanks is also driven through the Accelerated Community Infrastructure Programme.[39]

Both WCWDM measures and rainwater harvesting have multiple benefits in terms of the postponement of infrastructure, augmentation, mitigation against climate change, support to economic growth and ensuring that adequate water is available for equitable allocation.

Together WCWDM measures and rainwater harvesting comprise the WCWDM Near-term Priority Flagship Programme.

What are the Programme Components and Key Activities?

The NWRS2 sets out how the DWS will achieve its own core objectives and those of the water sector going forward. It is aligned with the National Development Plan (NDP) and sets a target of a 15% reduction in the average water demand by 2030 which is important for the Water Conservation and Water Demand Management Near-term Priority Programme.

The DWS is currently implementing a suite of measures to achieve the water demand reduction target by 2030. The interventions provide support to local government to refurbish the existing infrastructure of prioritised schemes, and to WCWDM programmes.[40]

The WCWDM Near-term Priority Flagship Programme is informed by four pillars (**Figure 25**).[41]

South African municipalities are extremely vulnerable to climate change impacts on water resources. Approximately half of South Africa's 278 municipalities are water services authorities (WSAs). Approximately 10% of municipal WSA's are already experiencing significant water supply challenges and are unable to meet the needs of communities and businesses.[42] Common to the WCWDM programmes in metropolitan municipalities is the implementation of enhanced metering, pressure management, leak detection and repair programmes and education and awareness programmes.

Figure 26 provides an overview of the WCWDM Near-term Priority Flagship Programme by water-use category.

38 Department of Water and Forestry. "Programme Guidelines for Intensive Family Food Production and Rainwater Harvesting." (Pretoria, Department of Water Affairs and Forestry, 2007.)
Available at: http://www.iwrm.co.za/resource%20doc/iwrm2/homestead_farming_and_rainwater_harvesting_guidelines/DWAF_Rainwater_Harvesting_Guidelines_082007.pdf

39 National Treasury Republic of South Africa. "Estimates of National Expenditure 2015." (Pretoria, National Treasury, 25 February 2015)

40 Department of Water Affairs. "Compulsory Briefing Session: Tenders: WP0485 WTE and W1014 WTE 07 - 19 January 2015."
Available at: https://www.dwa.gov.za/.../Presentation%20WP0485%20and%20W1014

41 Herbst, P. "South Africa WCWDM Strategic Overview." (4th Regional African Water Leakage Summit 2014. African Water Summit, 2014, Midrand South Africa.)

42 Department of Water Affairs. "Municipal Services Strategic Assessment (MuSSA) for South Africa 2013/2014." (Prepared by Water Services: Planning and Information: Business Intelligence Team September 2014)

Social Pillar	Economic Pillar	Technical Pillar	Regulatory and Legislative Pillar
• Formal recognition of leaders in WCWDM • Education and Awareness Programmes • Training materials & capacity building	• Incentives: • National WCWDM Fund • Economic charge for WCWDM • WCWDM Pricing Strategy • WCWDM guidelines on tariff structures • Potential subsidies	• National Water Use Efficiency (WUE) Information System • Investigations on the compulsory use of water efficient devices • Drive for universal metering of actual use • Establishment of WCWDM key performance indicators (KPIs) and benchmarks	• WCWDM regulations • WCWDM Water Management Area level strategies • WCWDM conditions, guidelines, etc. WCWDM national standards & water efficiency and labelling standards (WELS) • Development of guidelines

Figure 25: Pillars of Water Conservation and Demand Management Near-term Priority Flagship Programme *(Modified from Herbst, 2014)*

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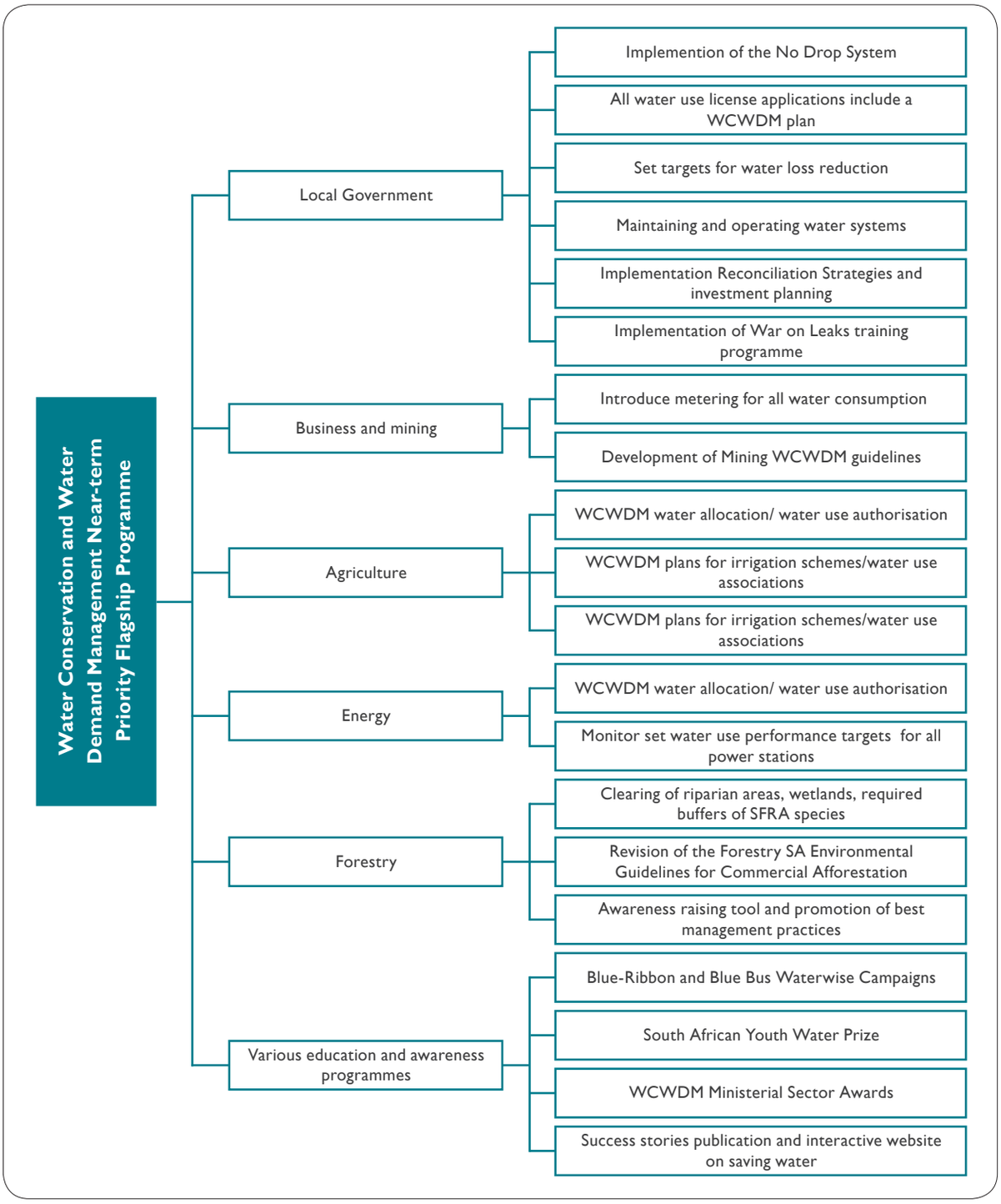


Figure 26: Components of the Water Conservation and Water Demand Management Near-term Priority Flagship Programme by water-use category

The Renewable Energy Near-Term Priority Flagship Programme

What does the Programme Address?

South Africa is a significant contributor of GHG emissions, globally and, by far the highest emitter on the African continent. The country is responsible for nearly half the CO_2 emissions for the entire continent of Africa. The energy sector in South Africa is the main contributor of GHG emissions contributing approximately 80% in 2010. The majority of emissions were from fossil fuel combustion to produce electricity.[43] Thus the energy sector provides the greatest opportunity to significantly reduce South Africa's contribution to global GHG emissions and to assist South Africa to play its part in mitigating climate change.

South Africa's location, geography and size all play a role in providing the country with multiple renewable energy (RE) resources. There are large areas of flat terrain with high irradiation, making it ideal for solar power. South Africa has some of the best solar resources in the world: the annual 24-hour global solar radiation average for South Africa is about 220 Watts per square metre (W/m^2) compared to about 150 W/m^2 for the USA and 100 W/m2 for Europe and the UK. Most areas of the country averages more than 2 500 hours of sunshine per year with average direct solar radiation levels ranging between 4.5 and 6.5 kilowatt hours per square metre (kWh/m^2) per day, giving it one of the highest solar energy resources in the world.[44] A coastline of approximately 3 000 km, provides favourable conditions for wind power in coastal areas. The east coast is tropical with large wood and sugar plantations creating biomass opportunities. Although a water scarce country, opportunities for small-scale hydropower do exist and have been exploited over the years.[45]

South Africa has made remarkable strides over the past five years, establishing renewable energy as a vital contributor to the country's economic infrastructure and climate change response. Prior to 2010, RE technology options played a minimal role in South Africa's energy mix, mainly in the form of demonstration or pilot projects. The electricity mix at this time included less than 0.5% capacity from renewables when excluding the existing large-scale hydro capacity (2.1GW).[46]

In 2008, South Africa initiated a process to introduce renewable energy feed-in-tariffs (REFIT) in order to facilitate the introduction of RE into the power system. Ultimately, actual implementation was done through a competitive tendering system in 2011, the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) with REFIT rates used as caps. The REIPPPP has propelled RE into the South African mainstream and, within the short space of four years, South Africa was catapulted into a world leadership position in RE investment and development.

RE technologies have a critical role to play in advancing transformation of the energy sector and social equity and

43 Department of Environmental Affairs. *GHG Inventory for South Africa: 2000 – 2010.* (Pretoria, Department of Environmental Affairs, 2014.) Available at: https://www.environment.gov.za/sites/default/files/docs/greenhousegas_invetorysouthafrica.pdf

44 Department of Energy. *State of Renewable Energy in South Africa.* (Pretoria: Department of Energy, September 2015). Available at: http://www.energy.gov.za/files/media/Pub/State-of-Renewable-Energy-in-South-Africa.pdf

45 Department of Energy. *State of Renewable Energy in South Africa.* (Pretoria: Department of Energy, September 2015).

46 A. Eberhard, J. Kolker, and J. Leigland. *South Africa's Renewable Energy IPP Procurement Programme: Success Factors and Lessons.* (Washington DC, PPIAF and World Bank, 2014.) Available at: http://www.gsb.uct.ac.za/files/PPIAFReport.pdf

South Africa has come to regard it as a critical success factor for economic growth and social development. RE will contribute towards creating green economy jobs, diversification of our energy mix and universal access to modern energy services, an aspiration based on the express commitment to expand the current 85% household electrification rate to 97% by 2025.[47] Renewables are expected to contribute both to grid and off-grid electrification, transport fuels and electricity demand-side management through fuel switching, for example, from electric geysers to solar water heaters.[48]

Table 10 provides an overview of South Africa's main renewable energy targets to 2030 and informs the programme components of the Renewable Energy Flagship Programmes.

Table 10: South Africa's renewable energy targets

Technology	Targets
Utility scale renewable energy	• Three ministerial determinations, for the procurement of 3 725 MW by 2016, 3 200 MW by 2020 and 6 300 MW by 2025, have been issued. • The allocated quantities are derived from the IRP 2010–2030 target of 17 800 MW new generation capacity set aside for renewables.[49] • The IRP 2010-2030 confirmed 2 600 MW of large-scale hydro to be imported from the southern African region and Eskom's 100 MW each for solar and wind plants. • The Renewable Energy White Paper (2003) targeted 10 000 GWh of RE by 2013.[50]
Roll-out of solar water heaters	The NDP has set a target of 5 million solar water heater installations by 2030.[51]

47 The Department of Trade and Industry. *IPAP in Brief: A User's Guide*. (Pretoria, dti, 2015.) Available at: http://www.dti.gov.za/industrial_development/industrial_development.jsp

48 Department of Energy. *State of Renewable Energy in South Africa*. Pretoria, Department of Energy, 2015.) Available at: http://www.gov.za/sites/www.gov.za/files/State%20of%20Renewable%20Energy%20in%20South%20Africa_s.pdf

49 Department of Energy. *Integrated Resource Plan for Electricity 2010–2030: Update report 2013*. (Pretoria, DOE, 2013). Available at: http://www.doe-irp.co.za/content/IRP2010_updatea.pdf

50 Department of Minerals and Energy. *White Paper on Renewable Energy Policy of South Africa*. (Pretoria, DME, 2003)

51 National Planning Commission. *National Development Plan: Vision for 2030*. (Pretoria, Government Printer, 2011). Available at: http://www.gov.za/sites/www.gov.za/files/devplan_2.pdf

What are the Programme Components and Key Activities?

The Renewable Energy Flagship Programme components and key activities are described in **Table 11**.

Table 11: Renewable Energy Flagship Programme components and key activities

Programme Description	Responsible Entity/Owner	Description
Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)	Department of Energy (DOE)	• Implementation of the IRP 2010–2030 is carried out through Ministerial Determinations, three Ministerial Determinations for the procurement of 3 725 MW by 2016, 3 200 MW by 2020 and 6 300 MW by 2025, have been issued • From the completed four bid windows, a total number of 92 independent power producers (IPPs) have secured contracts. Wind and solar photovoltaic (solar PV) power plants have been the first power plants from the RE portfolio to start operations • Since November 2013, the growing number of operational REIPPs supplied 4.3 TWh of electricity to the grid, 15% of which contributed to the system peak periods.
Solar water heater rollout	DOE	• The solar water heater (SWH) programme aims to roll out SWHs to both low-income and mid-to-high income households. • From the initial target of 1 million SWH installations to be achieved by March 2015, the government has been able to install 407 463 SWH by February 2015. • The programme is being re-designed to address some shortcomings observed during implementation.
Off-grid electrification	DOE	• Solar home systems (SHSs) were introduced in 2001 to provide electricity to remote rural areas that could not be connected to the national grid. SHSs were implemented primarily in the Limpopo, Eastern Cape and KwaZulu-Natal provinces. • To date, more than 96 000 SHSs have been installed under the rural off-grid electrification programme, which began in 2001. The South African government has invested in excess of R350 million in this programme, with other significant contributions coming from the off-grid concession companies responsible for actual implementation.
Green Economy Accord[52]	Economic Development Department (EDD)	• The Green Accord commitments cover the scaled up implementation of SWHs and RE through various undertakings involving government, the private sector and civil society. • The Industrial Development Corporation (IDC) has set aside a capital allocation of R22 billion for green projects over the next five years and a further R3 billion will be made available for manufacturing of green products and components. • The funding will aim to provide co-funding and industrial finance for commercially viable green economy projects.

52 Economic Development Department. *New Growth Path: Accord 4: Green Economy Accord.* (Pretoria, EDD, 2011.) Available at: http://www.gov.za/sites/www.gov.za/files/Accord_GREEN.pdf

Table 11 continued...

Programme Description	Responsible Entity/Owner	Description
Green industries development	Department of Trade and Industry (dti)	• The Industrial Policy Action Plan (IPAP) is the practical implementation of the National Industrial Policy Framework adopted in 2007 led by the dti.[53] Solar and wind energy, solar water heating and energy efficiency have specifically been included in IPAP since 2011 as a priority area. • In an effort to establish a local industry and create long-term sustainable employment prospects, the revised Preferential Procurement Regulations, 2011 in terms of the Preferential Procurement Policy Framework Act, 2000 (Act no. 5 of 2000) empower the dti to designate industries, sectors and sub-sectors for local production at a specified level of local content. In terms of the regulations solar water heater components have minimum local content requirements and the REIPPPP places a significant weighting on 'local content' in the project evaluation scorecard.
Strategic environmental assessment for renewable energy resources and renewable energy development zones in South Africa	DEA	• The DEA, in collaboration with the CSIR, has conducted Strategic Environmental Assessments (SEAs) for renewable energy resources, in particular for wind and solar photovoltaic (PV). • The SEA process is aimed at integrating environmental, economic and social factors to identify geographical areas (Renewable Energy Development Zones (REDZs)) where, in the medium to long term, wind and solar PV development will have the lowest possible impact on the environment while yielding the highest possible social and economic benefit to the country. • The REDZs also provide priority areas for investment into the electricity grid. • The wind assessment domain for this first iteration of the SEA is based on the Wind Atlas for South Africa (WASA) coverage available at the time of commencing the SEA (namely, parts of Northern Cape, Western Cape and Eastern Cape provinces).[54] The solar PV assessment domain was informed by the location of the majority of existing solar PV project applications at the commencement of the SEA and includes the five provinces of the Northern, Western and Eastern Cape, the Free State, and the North West. • The assessment of these areas led to the identification of eight proposed REDZs with a combined size of approximately 80 000 km2 and comprising about 17 000 farm portions.

53 The Department of Trade and Industry. *IPAP in Brief: A User's Guide.*

54 South African National Energy Development Institute. *Wind Atlas for South Africa.* (Sandton, Gauteng, SANEDI, no date) http://www.wasaproject.info/

The Energy Efficiency and Energy Demand Management Near-Term Priority Flagship Programme

What does the Programme Address?

Energy efficiency (EE) is globally recognised as one of the most important and cost-effective means for mitigating GHG emissions and has enormous potential in South Africa.[55] The National Energy Efficiency Strategy (NEES) is a consolidated national framework developed to guide the development and implementation of energy efficiency practices in South Africa.[56]

The NEES sets a national energy intensity reduction target of 12% by 2015 and outlines a programme of action to achieve the national intensity target (**Table 12**).[57]

The Energy Efficiency and Energy Demand Management (EEEDM) Flagship Programme is supported by a mature policy framework and implementation programme, and builds on existing initiatives and sectoral experience in implementing measures that respond to the challenges of climate change (**Table 13**).

Table 12: National and sectoral energy intensity targets

Sector	Improvement Target
Industry	15% by 2015
Mining	15% by 2015
Power Generation (excl. thermodynamic cycle.)	15% by 2015
Commercial & Public Buildings	15% by 2015
Residential	10% by 2015 (per capita)
Transport	9% by 2015

Open-pit mining requires a lot of energy

55 E. Worrel, L. Bernstein, J. Roy, L. Price and J. Harnisch. "Industrial Energy Efficiency and Climate Change Mitigation." *Energy Efficiency* 2, no. 2, 2008, 109–123.

56 Department of Energy. "Energy Efficiency Strategy of South Africa. (Pretoria, Department of Energy, 2005) Available at: http://www.energy.gov.za/files/esources/electricity/ee_strategy_05.pdf

57 Department of Energy. "National Energy Efficiency Strategy of the Republic of South Africa: First Review October 2008." (Pretoria, Government Printer, 2009.) http://www.gov.za/sites/www.gov.za/files/32342_908a.pdf

Table 13: Regulatory framework mandating the Energy Efficiency and Energy Demand Management Flagship Programme[58]

Policy/Strategy	Responsible Entity/Owner	Key Message
Energy Policy White Paper (1998)	DOE	• Recognises that energy should be sustainable and maximally efficient at all times.
NEES (2005) Revised 2008 & 2013	DOE	• Provides sectoral efficiency targets and supporting initiatives, and programme of action.
Climate Change Response Policy White Paper (2011)	DOE	• Calls for the immediate implementation of the Energy Efficiency and Energy Demand Management Flagship Programme.
Delivery Agreement for Outcome 10: Environmental Assets & Natural Resources That Are Valued, Protected & Continually Enhanced	DEA & Multiple Departments	• Calls for an accelerated pace in implementing the listed Nationally Appropriate Mitigation Actions.
Industrial Action Policy Plan (2012)	dti	• Identifies significant opportunities to develop new green & energy efficient industries, and highlights the need for improved energy efficiency in the manufacturing sector.
New Growth Path Framework (2011), Green Economy Accord and related Accords (2011)	EDD	• Calls for 'comprehensive' support for energy efficiency. • Focuses on energy efficiency and calls on Industry to effect its pledge with Government. • Local Procurement, Youth Employment and National Skills Development.
National Land Transport Act, 2009 (Act No. 5, 2009)	Department of Transport (DOT)	• Promotes improved efficiencies in transportation.
National Land Transport Master Plan (2007) and Synopsis - Draft For Discussion (2015)	DOT	• Promotion and prioritisation of public transport and efficient transport modes. • An integrated, smart and efficient transport system supporting a thriving economy that promotes sustainable economic growth, and preserves the environment.
National Budget Review 2012 and 2013	National Treasury	• Offers an incentive to implement energy efficiency measures to reduce future carbon tax liability.
National Development Plan (2011)	National Planning Commission	• Calls for a new path which is less carbon-intensive and energy efficient and scaled up investment in energy efficiency stepping in all sectors.

58 See References section for works referred to in this table.

What are the Programme Components and Key Activities?

The EEEDM Near-term Priority Flagship Programme is one of the most complex of all the Near-term Priority Flagship Programmes due to the importance of energy security and access to all sectors of South Africa's economy and society.

The implementation and uptake of energy efficiency technologies, measures and behaviour remains muted. Thus their potential for mitigating climate change and enhancing energy security in South Africa remains largely untapped, and more needs to be done to realise the significant mitigation potential available through improved energy efficiency.

The NEES targets three key components covering implementing instruments, four key sectors and cross-cutting issues to contribute to the overall shift in national energy intensity (**Figure 27**).

The National Energy Efficiency Strategy Sectoral Strategic Focus Areas, which inform the programme components and key activities of the Energy Efficiency and Energy Demand Management Flagship Programme, are described in **Table 14**.

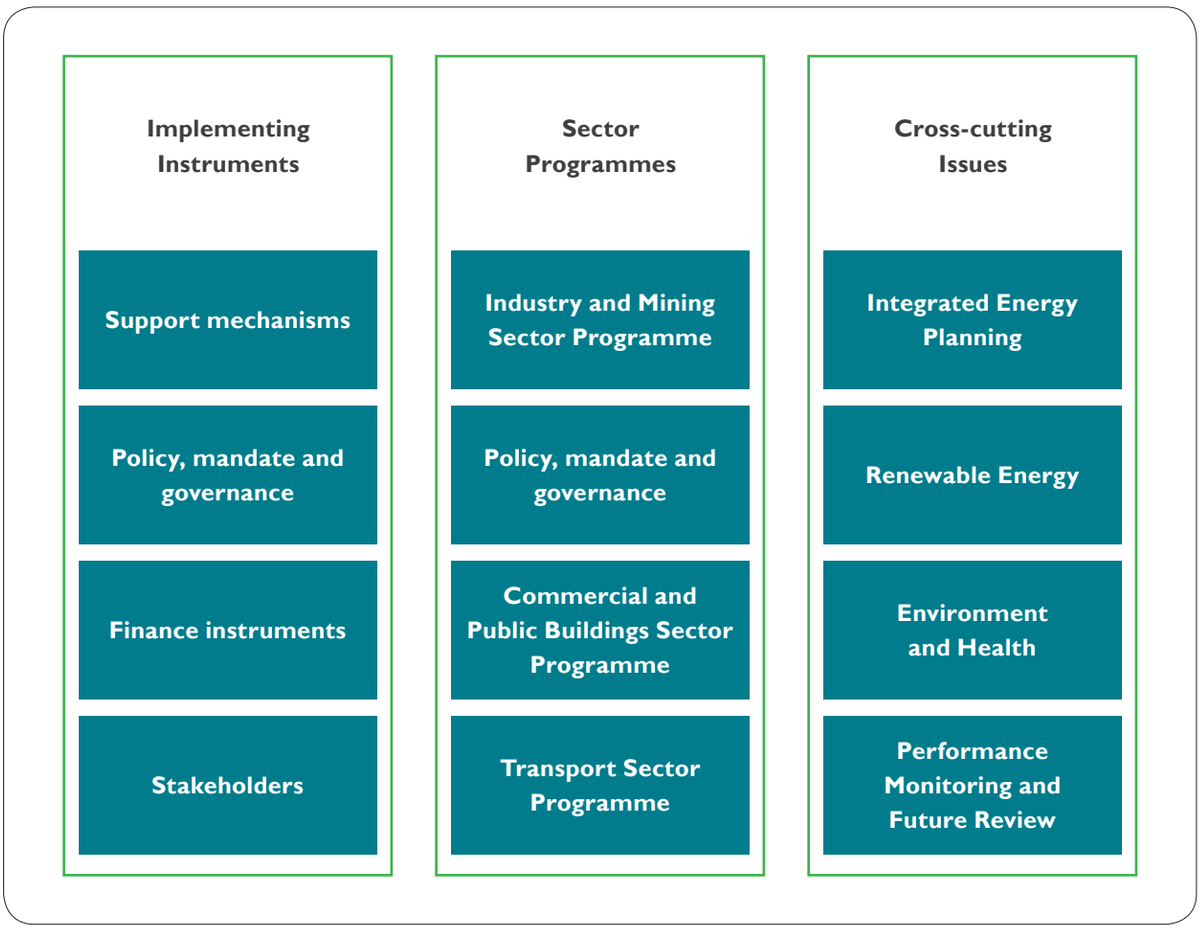


Figure 27: Overview of the key components of the National Energy Efficiency Strategy

Table 14: Components and key activities of the Energy Efficiency and Energy Demand Management Flagship Programme (based on the National Energy Efficiency Strategy sectoral strategic focus areas)

Sector	Core Objective	Opportunity	High Level Description
Industry and Mining	• To decouple the rate of growth of industrial energy consumption from the rate of growth in industrial output • To bring the energy intensities of major industrial sectors into line with international standards and best practice.	Norms and standards for technologies	• Formulate, adopt and implement standards. Train inspectors and implement measurement and verification (M&V) reporting.
		Energy audit scheme	• Train auditors in formalised certification process. • Identify sectors for mandatory programmes and M&V reporting.
		Energy management best practice	• Set up demonstration projects and introduce appropriate training schemes. • Develop a corporate commitment programme and M&V reporting.
		Technology information and best practice	• Introduce regulations on EE management, measurement and reporting, and international benchmarking, and develop a database to inform energy planning.
		Promotion of ESCOs	• Promote and accredit energy services companies (ESCOs).
		EE investments	• Establish a Designated National Authority (DNA), improve awareness of clean development mechanism (CDM) opportunities and maximise EE investments.
Commercial and Public Buildings	• To demonstrate the Government's commitment to sustainable energy development within its own building stock. • To progressively upgrade the energy performance of existing public and commercial building stock. • To achieve best practice energy performance in new public and commercial building stock.	Energy efficiency standards for commercial buildings	• Incorporate national standards for buildings into building regulations and introduce of building energy labels. • Incorporate energy efficiency into building design and energy efficient technologies in existing buildings. • Adopt voluntary performance rating systems for existing buildings.
		Mandatory audits	• Develop process audit standard and framework. • Encourage energy audits and adoption of the International Organisation for Standardisation / South African National Standard (ISO/SANS) 50001. • Train auditors and monitor progress on M&V reporting on SANS 50001
		Energy management systems	• Test and promote appropriate systems. • Promote energy/building management systems for buildings. • Promote triple bottom line reporting.
		Technologies	• Efficient lighting programmes with M&V reporting (SANS 50010).

Table 14 continued...

Sector	Core Objective	Opportunity	High Level Description
Residential	• To introduce state-of-the-art technologies. • To enforce standards of energy efficiency in housing, including for hot water heating systems. • To introduce state-of-the-art technologies with labelling/ efficiency standards for household appliances.	EE standards	• National standards for residential buildings incorporated into building regulations with M&V reporting.
		Appliance labelling	• Establish standards, make labelling mandatory and implement a monitoring programme.
		Awareness raising programme	• Develop and implement a targeted programme.
		Non-electrical appliance standards	• Conduct a study of fossil fuel and biomass appliances, develop standards and implement.
		Fuel standards	• Conduct studies to develop and implement national standards. • Implement fuel standards programme.
Transport	• Public transport: A modal shift in passenger transport from low-capacity vehicles to higher efficiency bus and rail systems. • Increase non-motorised transport • Travel demand management: Reduce trips made by motorised transport. • Freight transport: Increase modal efficiency. • Urban form: Redress South Africa's spatially dispersed pattern of urban development. • Increase efficiency of current vehicle technologies and implement alternative fuels and propulsion systems. • Traffic management: Reduce congestion in urban areas	Optimise passenger and freight transport	• Draft national policy with appropriate regulations. Establish local transit authorities.
		EE management in passenger transport	• Introduce EE labels and emission standards. Audits on vehicle fleet operators, awareness raising programmes and roadworthy tests with emission tests.
		Facilitate EE in freight logistics	• Identify most efficient transport type for freight and complete study to identify impacts of shifts between road and rail. • Explore opportunities such as regenerative braking, bio-fuel for locomotives, and consider energy efficiency in investment plans.
		Fuel efficient vehicles	• Include transport fuel efficiency promotion in ongoing fiscal reform. • Fuel efficiency labelling of vehicles implemented for new vehicles. • Conduct and support fleet audits stressing regular vehicle maintenance. • Regulations, standards and codes of practice to stimulate the supply of energy efficient vehicle technologies. • Information programmes to sensitise the public to the benefits of efficiency measures.

The Transport Near-Term Priority Flagship Programme

What does the Programme Address?

Most transport measures are long-term interventions and require major shifts in the current transport systems to improve GHG emission intensity and resilience as outlined in **Table 15**.

Table 15: An overview of South Africa's transport systems: Opportunities for enhancing climate resilience and mitigating GHG emissions

Focus Area	Baseline
Public transport	Non-integrated transport planning across various modes that are not sufficiently customer focused and are inefficient with poor levels of reliability, predictability, comfort and safety.
Freight movement	The rail network faces strong competition from road and has lost large tonnages to road. Freight movement by road has a significant impact on the national road network and results in high transport costs in the logistics value chain and damage to road infrastructure. The branch line network which constitutes nearly 40% of the route network in Transnet Freight Rail has been neglected for many years and as a result nearly half of the branch lines in the network are either closed or have no active service.
Infrastructure and limited accessibility	Rail and rural road infrastructure has been neglected and/or under-maintained for a couple of decades. This is in part due to the transport sector competing for funding from the fiscus with other government / public sector services and national priorities. Poor infrastructure is also an important factor limiting accessibility in rural areas.
Economic challenges	The physical remoteness and low population densities of both urban and rural areas has an impact on the ability of transport to support national economic and social development objectives.
Liveable communities and urban migration	The spatial divide created by the apartheid legacy prevents inclusive development, compounded by poor road accessibility in remote rural areas and a lack of employment opportunities, resulting in urban migration.
Modal integration	Despite introducing integrated rapid public transport networks (IRPTNs) or other plans and policies supporting the integration of transport modes, transport hub development has been very slow.
Non-motorised transport	In South Africa, the integration of non-motorised transport (NMT) facilities into spatial development and the streetscape has not yet received sufficient attention by the different spheres of government and their implementation agencies. There is a lack of provision of NMT infrastructure (walkways and bicycle lanes) and NMT infrastructure is not continuous. [59]

59 F. Labuschagne and H. Ribbens. "Walk the Talk on the Mainstreaming of Non-motorised Transport in South Africa." (Proceedings of the 33rd Southern African Transport Conference (SATC 2014) 7–10 July 2014. Pretoria: South Africa.) Available at: http://repository.up.ac.za/dspace/bitstream/handle/2263/45524/Labuschagne_Walk_2014.pdf?sequence=1&isAllowed=y

Transport is one of the fastest growing sources of GHG emissions in South Africa. Emissions from transport-related fossil fuel combustion accounted for 11% of the emissions generated from the energy sector.[60] Road transport, encompassing private, freight and public transport vehicles, generates the majority of transport related emissions. As with other energy-related emissions, transport offers a significantly high potential for climate change mitigation. Most transport in South Africa takes place by road.

Transport infrastructure is also vulnerable to the impacts of extreme climatic events and plays an important role in the planning of climate resilient settlements and spatial planning. Transport infrastructure comprises all physical elements upon which transport operations take place. It includes roads, railways, airports, harbours, pipelines, interchange facilities, and the associated dedicated power and communications systems.

Transport has a well-developed policy basis for supporting the implementation of the Transport Flagship Programme. The Department of Transport's National Transport Policy White Paper gazetted in 1996, is the overarching policy and sets the tone for the development of South Africa's transport systems. The White Paper, integrates environmentally sustainable transport as a core part of national policy, and the strategic basis for the provision of transport services and infrastructure.

The 1996 White Paper recognised the climate change relevant aspect of transport, namely:

- spatial planning and ecological footprint
- the energy intensity of the South African transportation system
- reliance of the transportation system on non-renewable energy sources.[61]

What are the Programme Components and Key Activities?

Transport infrastructure represents a significant proportion of Government's total financial investment in fixed assets.[62] Public-sector spending on economic infrastructure is now at its highest level in 25 years.[63]

The following programmes were identified to give effect to the NCCRP (**Table 16**).

60 Department of Environmental Affairs. 2014. *GHG Inventory for South Africa: 2000–2010.*

61 Department of Transport. White Paper on National Transport Policy. (Pretoria, Government Printer, 1996). Available at: http://www.gov.za/documents/national-transport-policy-white-paper

62 Department of Transport. White Paper on National Transport Policy.

63 National Treasury. Public-sector infrastructure update. Annexure B in Budget Review 2015. (Pretoria, National Treasury, 2015, 121-132.) Available at: http://www.treasury.gov.za/documents/national%20budget/2015/review/FullReview.pdf

Table 16: Transport Near-term Priority Flagship Programme components and key activities

Programme component	Responsible Entity/Owner	Description
Upgrading passenger rail infrastructure and services	Passenger Rail Agency of South Africa (PRASA)	• The programme aims to upgrade and expand the priority commuter rail corridors by finalising the rail policy, the rail plan strategy and improving system performance in 21 priority commuter rail corridors. • PRASA has been allocated R11.2 billion for its rolling stock fleet-renewal programme. Under this 10-year initiative, the agency is expected to receive the first 44 train sets by 2019. Capital transfers are for new train sets for Metrorail, and also for upgrading and refurbishing infrastructure for both Metrorail and Shosholoza Meyl, the long distance passenger rail service.
Upgrading freight rail infrastructure and services	Transnet and the Department of Transport	• Transnet's rail infrastructure upgrade programme is encapsulated in the Transnet Market Demand Strategy (MDS) which is set to spend R500 billion over the next decade. [64] • R205 billion has been allocated to rail projects and R151 billion to general freight to support the growth in volumes to 170 million tons per annum. Part of the MDS focuses on revitalising branch lines in small and rural areas. Approximately R10 billion will be required to upgrade the branch lines.
Expanding road based public transport	Department of Transport and Local Municipalities	• The Bus Rapid Transport (BRT) Programme is the road-based component of the Public Transport Strategy approved by Cabinet in March 2007. Currently, 4 of the 13 cities operate services, and a significant component of the grant will be spent on building infrastructure on these 13 networks. The grant is expected to increase to R6.8 billion in 2018/19. • Both Johannesburg and Cape Town constructed over 20 km of dedicated bus lanes on which services are operated and expanded operations up to 100 000 passenger trips a day on each system. • Nelson Mandela Bay Municipality has continued to run a pilot service on its upgraded network. The Tshwane BRT started operating in 2014. Construction has began in eThekwini, Rustenburg and Mbombela. George municipality was a new entrant to the public transport network development enterprise and during the course of the next two years it will complete its full city-wide network. • Buffalo City, Ekurhuleni, Mangaung, Msunduzi and Polokwane completed their public transport network development planning and service contract designs during 2013/14 and have started with network development.
High speed rail - Gautrain rapid rail link	Gauteng Provincial Government and the Bombela Concession Company	• The Gautrain Project was one of the largest transportation projects in South Africa. The Gautrain is an 80 kilometre (50 mile) mass rapid transit railway, around which an integrated intermodal transport system has been built aimed at providing an alternative public transport mode to car users and therefore to attract private car-users to the train. Feasibility studies are underway to look at expanding the Gautrain services to other parts of Gauteng.

64 SAnews.gov.za. "Transnet completes R800 million City Deep Terminal upgrade." *South African Government News Agency*, 6 November 2015. http://www.sanews.gov.za/south-africa/transnet-completes-r800m-city-deep-terminal-upgrade

Table 16 continued...

Programme component	Responsible Entity/Owner	Description
Non-motorised Transport Programme	DEA and EThekwini, Johannesburg and Polokwane (Programme funded by the KfW Development Bank (KfW))	• The Non-motorised Transport (NMT) programme was originally part of the Department's 2010 FIFA World Cup National Greening Legacy Programme launched in May 2010. The programme aimed to assist cities to promote walking and cycling through demonstration walking and cycling infrastructure projects. • The City of Johannesburg has completed construction linked to the programme in Orlando, Soweto. Infrastructure development has also been completed in eThekwini Metro, with NMT networks across the city that will include Umlazi, KwaMashu, Chatsworth, Inanda, KwaXimba, uMbumbulu and Buffelsdraai.[65] Infrastructure development is at final stages of completion in Polokwane Local Municipality. In 2016, the DEA and KfW launched phase 2 of the NMT programme to extend the existing bicycle networks and intermodal urban transportation networks as well as to initiate enterprise development.
Shova Kalula	Department of Transport	• The Shova Kalula National Bicycle programme was introduced as a pilot programme in 2001 to improve mobility and access to basic needs and economic opportunities particularly in rural, remote and poorly resourced areas. More than 950 000 bicycles have been distributed to date, in all provinces. • The focus going forward is to assist 21 district municipalities in developing NMT infrastructure and facilities. The number of bicycles distributed to schools and other beneficiaries will be increased in addition to building local manufacturing capacity to create jobs and local small businesses.
Taxi Recapitalisation Programme	Department of Transport	• Minibus taxis are responsible for 65% of the 2.5 billion annual passenger trips in urban areas, as well as a high percentage of rural and intercity travel. The programme was introduced in 2005 to bring about safe and reliable taxi operations by introducing new taxis. Operators are paid to scrap their vehicles and buy new ones. • The programme includes taking the country's fleet of 120 000 minibus taxis off the road by the year 2015 and replacing them with larger, safer vehicles which meet Euro IV emission standards. A total of 135 894 taxis had been scrapped by end of March 2013, leaving 81 735 that still needed to be scrapped under the programme. • The need to modernise the taxi industry and to align and integrate the taxi recapitalisation programme with national and provincial rail services, metropolitan rapid public transport corridor services and provincial bus services remains an urgent issue.

65 SAnews.gov.za. "Non-motorised transport the way to go in eThekwini." *South African Government News Agency*, 3 October 2015. http://www.sanews.gov.za/south-africa/non-motorised-transport-way-go-ethekwini

The Waste Management Near-Term Priority Flagship Programme

What does the Programme Address?

South Africa's waste management approach is based on the implementation of the waste management hierarchy shown in **Figure 28**.[66]

South Africa generated approximately 108 million tonnes of waste in 2011, 98 million tonnes of which was disposed of at landfills.[67] On the wastewater side, South Africa processes approximately 5 128.8 million litres daily.[68]

Though the waste sector accounts for the smallest share of South Africa's total GHG emissions, emissions from this sector have increased over the past decade. Emissions from solid waste disposal accounted for approximately 80% of GHG emissions from this sector in 2010 while wastewater treatment contributes mainly methane (CH4) and nitrous oxide (N_2O) to South Africa's national GHG emissions.[69]

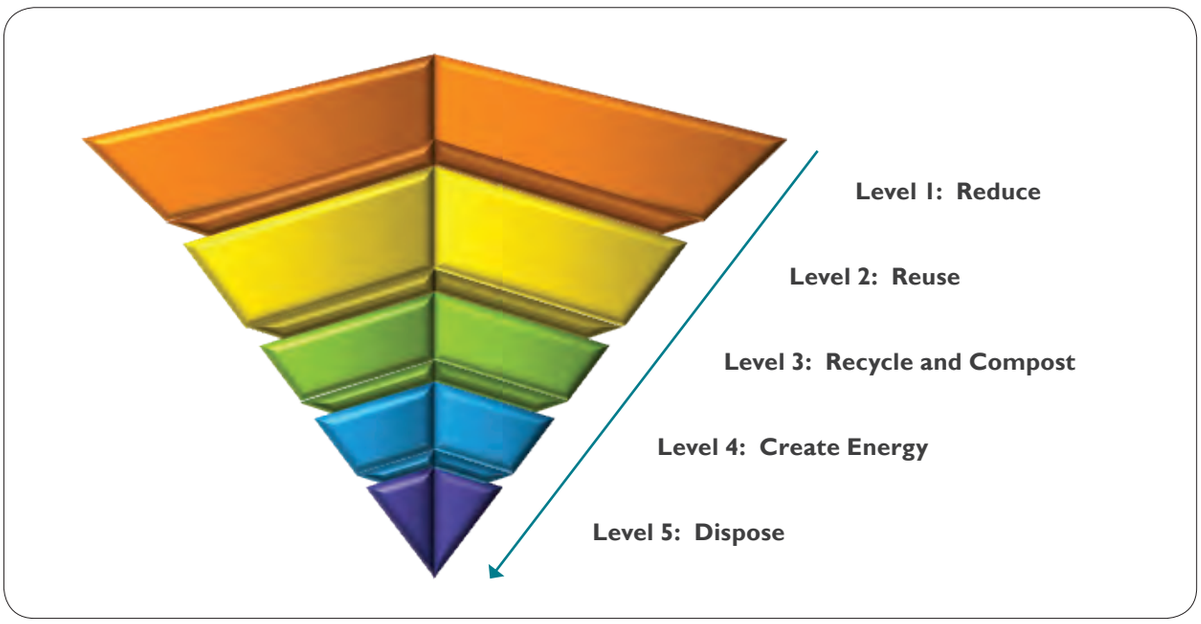


Figure 28: The Waste Management Hierarchy

66 Department of Environmental Affairs. *National Waste Management Strategy: November 2011*. (Pretoria, Department of Environmental Affairs, 2011.)
Available at: https://www.environment.gov.za/sites/default/files/docs/nationalwaste_management_strategy.pdf

67 Department of Environmental Affairs.. National Waste Information Baseline Report. (Pretoria, Department of Environmental Affairs, 2012). Available at: http://sawic.environment.gov.za/documents/1880.pdf

68 Department of Water and Sanitation. 2014 Green Drop Progress Report: Introduction to Green Drop PAT 2014 / National Overview. (Pretoria, Department of Water and Sanitation, 2016).
Available at: http://www.kgatelopele.gov.za/index.php/newsletters?task=document.viewdoc&id=299

69 Department of Environmental Affairs. 2014. *GHG Inventory for South Africa: 2000–2010*.

Waste-to-Energy (WtE) has been embedded by the South African government as part of the waste hierarchy and links climate change and waste management. WtE projects target residual waste remaining after the application of higher tiers in the waste management hierarchy. These technologies have a double effect of reducing GHGs by preventing atmospheric methane emissions generated from landfills or wastewater treatment and also providing energy, either for direct use or to generate electricity, thus displacing demand for coal-based electricity from the national utility.The Waste Management Flagship Programme sits at the intersection of at least three government policies and priorities shown in **Figure 29**.

What are the Programme Components and Key Activities?

The waste sector GHG inventory is primarily composed of two components:

- methane emissions from landfills
- methane and nitrous oxide emissions from wastewater treatment

The Waste Management Flagship Programme therefore aims to mitigate emissions from these sources by addressing barriers to the implementation of mitigation projects in the waste sector, demonstrating real-world approaches to project implementation and attracting investment in the sector

In addition, this flagship programme is also designed to:

- maximise sustainable development benefits, especially energy production and job-creation
- promote and demonstrate the waste management hierarchy

Table 17 provides an overview of the Waste Management Flagship Programme structure.

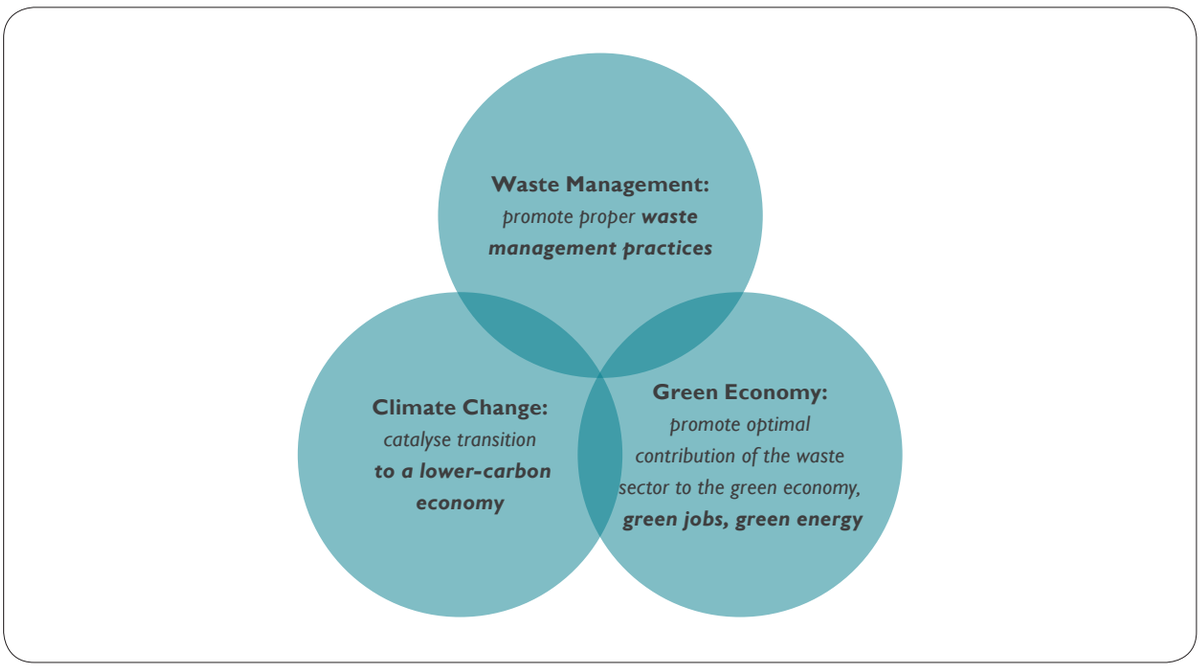


Figure 29: Locating the Waste Management Flagship Programme in national policies and priorities

Table 17: Structure of Waste Management Flagship Programme

Focus	Project Type	Description
Mitigation	Solid waste management	• Landfill gas-to-energy projects (short-term, lowest hanging fruits) • Diversion of waste from landfills
	Wastewater management	• Biogas combined heat and power projects in municipal wastewater treatment facilities
Enabling activities	Tools and enablers	• Development of tools to support implementation and scale up • Development of legislative or policy enablers
	Project development support	• Development and packaging of projects • Hands-on support to implementation and scaling up of projects

The specific components of this flagship programme, together with their implementation plan and the anticipated climate change outcomes are outlined below.

The Waste Management Flagship Programme places emphasis on mitigation projects that are at implementation stage or at advanced design stages in local municipalities. The programmatic diversion of waste in local municipalities is still a very new concept, and as such there are currently no projects under implementation.

Table 18 and **Table 19** detail the actual projects and activities included under the Waste Management Flagship Programme.

Figure 30 provides an overview of the implementation timeline for the Waste Management Flagship Programme.

Paper waste awaiting recycling

Table 18: Ready-to-go waste-to-energy mitigation projects under the Waste Management Flagship Programme

Responsible entity/owner	Name	Details	Operation start date	Energy output	Total GHG abated by 2035 ($ktCO_2e$)
City of Johannesburg	Alternative waste treatment	Waste diverted from landfills for biogas production and electricity generation	2017	40 MW	35 002
	Robinson Deep Landfill Gas (LFG) project	Project is included in the REIPPPP (part of the RE Flagship Programme)	2014	5.5 MW	5 573
	Marie Louise LFG project	Project is included in the REIPPPP (part of the RE Flagship Programme)	2014	6.6 MW	6 687
	Linbro Park LFG project	Project is included in the REIPPPP (part of the RE Flagship Programme)	2015	3.3 MW	3 192
	Goudkoppies LFG project	Project is included in the REIPPPP (part of the RE Flagship Programme)	2015	3.3 MW	3 192
	Ennerdale LFG project	Project is included in the REIPPPP (part of the RE Flagship Programme)	2015	0.5 MW	484
Johannesburg Water	Northern Works Waste Water Treatment Works	Biogas production and onsite combined heat and power use	2012	1.1MW	1 133
	Driefontein Waste Water Treatment Works	Biogas production and onsite combined heat and power use	2014	0.76 MW	770
	Bushkoppie Waste Water Treatment Works	Biogas production and onsite combined heat and power use	2015	2.1 MW	2 023
eThekwini	Bisasar Green Waste Treatment	Biogas from waste (4 000 tonnes/ annum) and electricity generation	2015	2 MW	1 944
	Buffelsdraai LFG project	Landfill gas to electricity plant	2016	8 MW	7 369
City of Cape Town	LFG extraction and utilisation	Programme of activities (POA) being registered as Coastal Park LFG under CDM – final registration stage	Estimated 2017	2 MW	1 842
Ekurhuleni	Ekurhuleni LFG Programme	Landfill gas-to-electricity programme in five landfill sites	2014 (selected sites)	6 MW total	5 637

Table 19: Enabling activities of the Waste Management Flagship Programme

Programme Component	Details	Lead institutions
Industry waste management plans (IWMPs)	• Various waste stream IWMPs to be developed • This includes piloting and promoting waste separation at source	• Waste stream sectors and the DEA
National Waste-to-Energy Policy	• Policy to support implementation and scaling up of waste-to-energy projects	• Led by the DEA
Landfill waste diversion municipal support toolkit	• Toolkit to support municipalities to develop and sustainably implement programmes that divert waste from landfills • Web-based information and guidance tools and waste-to-energy guidance manuals • Training in using the tools	• Led by the DEA and SALGA • Municipal stakeholders
Waste-to-energy prefeasibility studies	• Municipal prefeasibility studies to support implementation of lowest hanging fruits for waste-to-energy projects	• Led by the DEA and SALGA • Municipal stakeholders
Landfill waste diversion nationally appropriate mitigation actions	• Design and packaging of various municipal projects for diversion of waste from landfills into potentially fundable projects • Supporting the funding and implementation processes	• Led by the DEA • Relevant partners including municipalities, GIZ, etc.
Wastewater treatment, biogas-to-energy projects, nationally appropriate mitigation actions	• Design and packaging of various municipal projects for diversion of waste from landfills into potentially fundable projects • Supporting the funding and implementation processes	• Led by the DEA, the DWS and SALGA • Others include Treasury, municipalities
Incorporation of biogas-to-energy in wastewater treatment works as an indicator in Green Drop scheme	• Improving the Green drop scheme by entrenching biogas-to-energy practices as part of good practice in wastewater management	• Led by the DEA, the DWS and the DoE

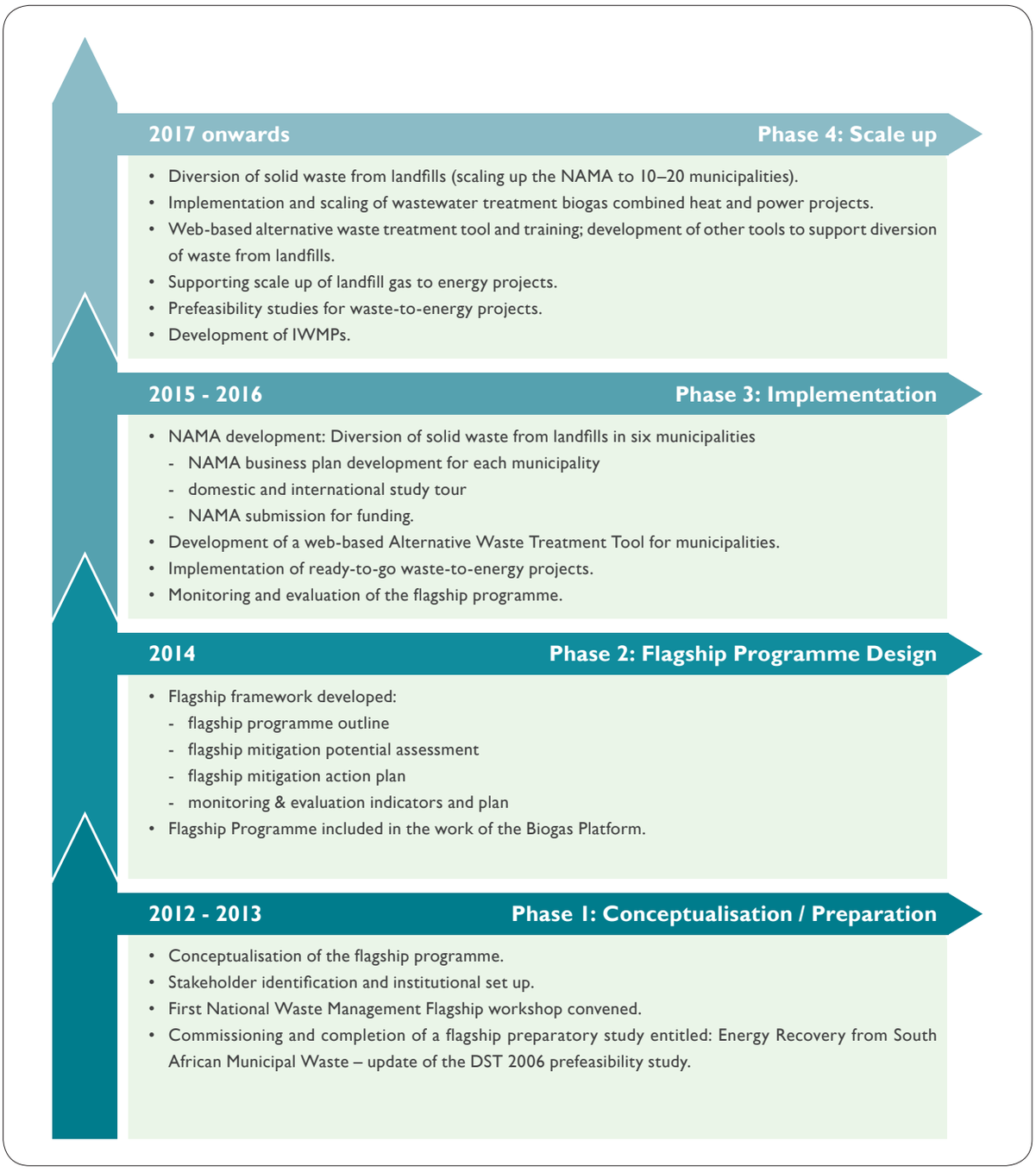


Figure 30: Implementation timeline for the Waste Management Flagship Programme

The Carbon Capture and Sequestration (Storage) Near-Term Priority Flagship Programme

What does the Programme Address?

Together the energy and industrial processes and product use (IPPU) sectors generated 87% of South Africa's GHG emissions in 2010.[70]

Carbon capture and storage (CCS) is the only technology that can reduce CO_2 emissions substantially while allowing the continued use of fossil fuels.[71] CCS prevents large amounts of CO_2 from being released into the atmosphere by capturing CO_2 produced by large (typically larger than 0.1 $MtCO_2$ / year) stationary point sources (for example, synfuels plants, the electricity supply sector and hydrocarbon-fuelled power plants, refineries, cement plants and steel mills). Captured CO_2 is then compressed for transportation by truck or pipeline and finally injected into a rock formation at a depth of 800 m or deeper and a suite of measurement, monitoring, and verification (MMV) technologies are then applied to ensure the safety, efficacy, and permanence of the captured CO_2's isolation from the atmosphere.[72]

While the individual component technologies required for CCS are generally well understood and, in some cases, technologically mature, integrated CCS has not been implemented in South Africa.

In 2006, South Africa undertook to investigate CCS as a viable transition technology focusing on the geological storage of CO_2 while shifting the economy from its reliance on fossil fuels to renewable and nuclear energy,. Components of integrated CCS systems exist and are in use today by the hydrocarbon exploration, production and transport, as well as the petrochemical refining sectors.[73]

The South African National Energy Development Institute (SANEDI) under the Department of Energy (DoE) initiated the technical work on CCS, while the DOE has led work on the policy and regulatory aspects of CCS.

What are the Programme Components and Key Activities?

The CCS Near-term Priority Flagship Programme is made up of three key components, led by the SANEDI senior manager for clean fossil fuels and implemented through the head of the South African Centre for Carbon Capture and Storage (SACCCS) and the head of the CO_2 Storage Pilot Project (**Figure 31**).

70 Department of Environmental Affairs. *GHG Inventory For South Africa: 2000–2010.*

71 H. J. Herzog. "Scaling Up Carbon Dioxide Capture And Storage: From Megatons To Gigatons." *Energy Economics*, 33, no. 4, July 2011, 597–604.

72 The Global CCS Institute. "Understanding carbon capture and storage: The climate change challenge." http://www.globalccsinstitute.com/content/understanding-carbon-capture-and-storage

73 International Energy Agency (IEA). *Technology roadmap: Carbon Capture and Storage – 2013 edition.* (Paris: IEA Publications, 2013) http://www.iea.org/publications/freepublications/publication/TechnologyRoadmapCarbonCaptureandStorage.pdf

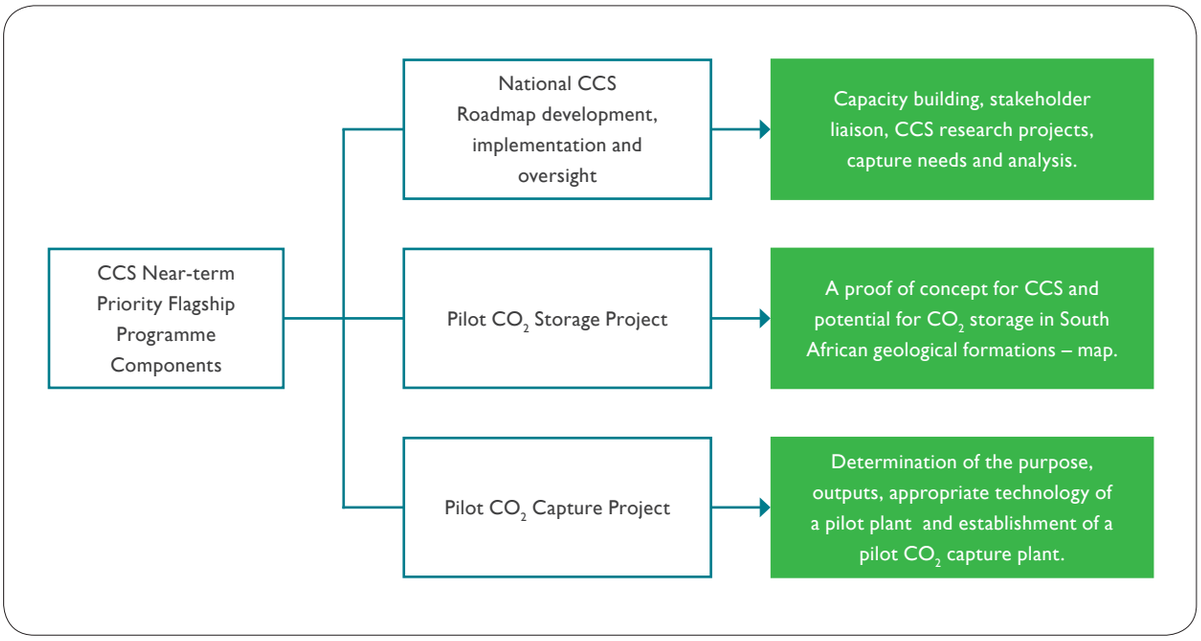


Figure 31: Carbon Capture and Storage Near-term Priority Flagship Programme

The implementation of the CCS Near-term Priority Flagship Programme is governed by the South African CCS Roadmap. The CCS Roadmap details steps for the commercial scale rollout of CCS comprising five phases, each phase requiring a major decision.

A key milestone in the rollout of the CCS Flagship Programme is the Pilot CO_2 Storage Project (PCSP). The objective of the PCSP is to inject approximately 10000 tonnes of CO_2 per year into a selected geological storage site. The first test injection is scheduled for 2017 but is contingent on a number of factors relating to the exploration programme. The test injection will be the first time that CO_2 will be injected into a South African geological formation.

The roadmap covers the period from 2004 to 2025, at which point it is anticipated that the commercial scale rollout of integrated CCS will take place if all the necessary conditions exist.

The roadmap is detailed in **Figure 32**.

2025 — **Phase 5**

- The commercial rollout of CCS in South Africa will depend on the successful technical outcomes of the previous stages as well as economic incentives and regulatory requirements.
- The initial projects are planned to inject approximately 1 million tonnes of CO_2 per year.

2020 — **Phase 4**

- An integrated demonstration that involves all four stages of CCS, namely capture, transport, injection, storage and monitoring.
- The demonstration is the bridge between proving the feasibility of CCS in South Africa and commercial rollout.
- The demonstration is planned to inject approximately 100 000 tonnes of CO_2 per year.

2017 — **Phase 3**

- Comprises three elements, namely; (i) the National CCS Roadmap oversight, (ii) the pilot CO_2 storage project and (iii) a pilot CO_2 capture plant – the latter depending on the outcome of a needs scoping study.
- These elements facilitate a focus on the individual operations and outputs and each element will be subject to a separate work plan.

2010 — **Phase 2**

- SANEDI initiated a study to ascertain the potential for the geological storage of CO_2. The output in 2010 was an *Atlas on Geological Storage of Carbon Dioxide in South Africa* and a *Technical Report on the Geological Storage of Carbon Dioxide in South Africa* in 2011.
- Four possible CO_2 geological storage basins were identified with a theoretical potential storage capacity of 150 billion tonnes.

2004 — **Phase 1**

- A preliminary investigation indicated that South Africa theoretically had capturable CO_2 emissions and potential storage possibilities.
- A study published in 2004 confirmed both capturable emissions and potential geological storage. This phase was led by the DOE.
- South Africa decided in 2006 to concentrate on geological storage in the near term.

Figure 32: Carbon Capture and Storage Near-term Priority Flagship Programme

The Adaptation Research Near-Term Priority Flagship Programme: The Long-Term Adaptation Scenarios

What does the Programme Address?

The need for well-informed decision-making, based on technically sound and scientifically rigorous information is frequently cited as critical for an effective adaptation response. The NDP calls for further research to inform climate resilient implementation and planning through the provision of more detailed information about potential climate change impacts on key sectors and at a scale relevant for planning and implementation.[74] The importance of strong research initiatives dedicated to enabling South Africa's adaptation and mitigation response efforts is a central theme of the NCCRP.

The Adaptation Research Near-term Priority Flagship Programme is referred to as the Long-Term Adaptation Scenarios (LTAS) Flagship Research Programme mandated by the NCCRP and the NDP. The LTAS is a multi-sectoral research programme aimed at improving South Africa's adaptation knowledge and planning resources.[75]

The programme was led by the DEA, and championed by the Climate Change and Air Quality Branch: Climate Adaption Chief Directorate, with the South African National Biodiversity Institute (SANBI) as the technical research lead and technical and financial support from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

The governance structure includes a technical work group (TWG) chaired by the DEA and reporting to the Intergovernmental Committee on Climate Change (IGCCC) and the National Committee on Climate Change (NCCC) on the progress of implementation. Representatives from relevant government sectors and departments, namely the Department of Agriculture, Forestry and Fisheries (DAFF), the Department of Cooperative Governance and Traditional Affairs (DCoG), the Department of Water and Sanitation (DWS), National Treasury, the National Disaster Management Centre, the South African Local Government Association (SALGA), non-governmental organisations (NGOs), the private sector, and technical experts from research and academic institutions all formed part of the TWG.

What are the Programme Components and Key Activities?

The LTAS aims to develop national and sub-national adaptation scenarios for South Africa under plausible future climate conditions and development pathways which can then inform key decisions in future development and adaptation planning so as to build climate resilience.

The LTAS programme architecture is relatively simple, even though the topic the programme deals with is highly complex and the scope is enormous. The programme was implemented in two phases. The first phase focused primarily on understanding the nature and degree of expected climate change in South Africa. The second component of the LTAS programme focused on developing adaptation scenarios under future climates in South Africa.

The key outcomes of the LTAS are as follows:

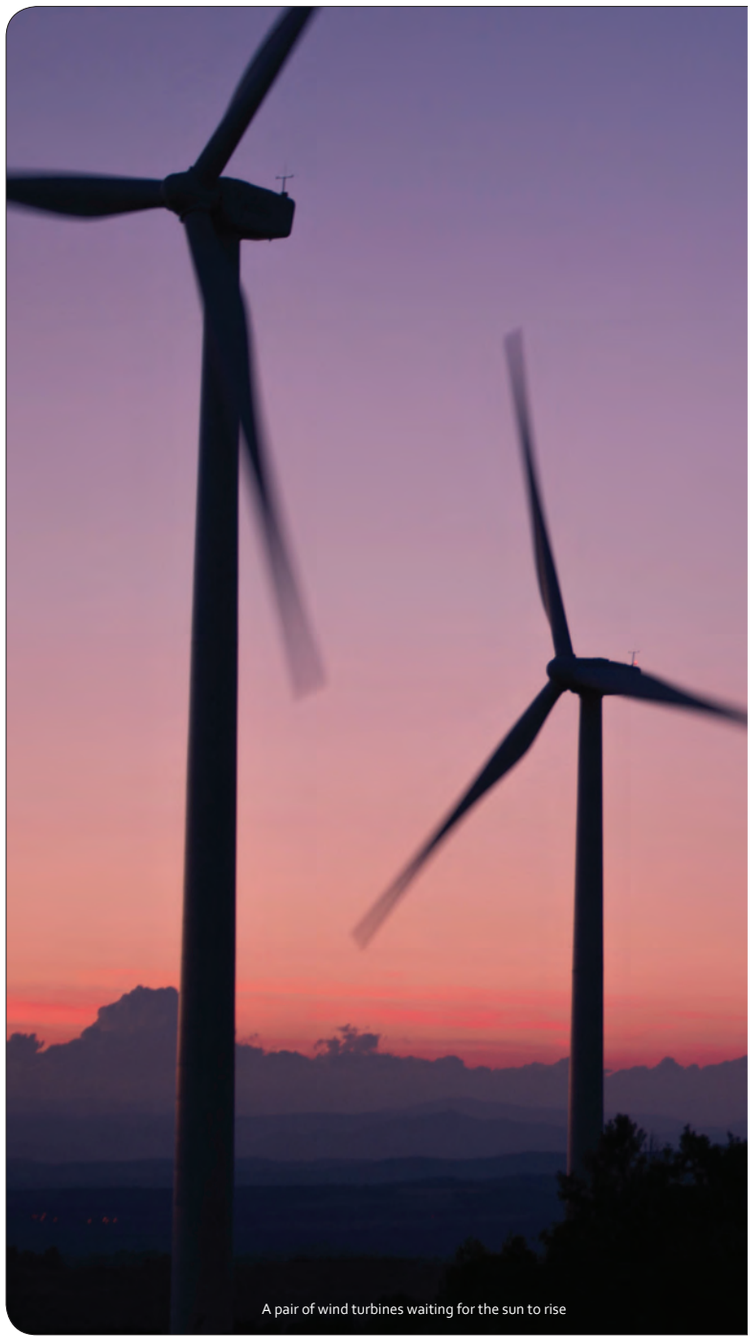
- Increased knowledge and understanding of climate change impacts, adaptation responses and future research needs for primary sectors.

74 National Planning Commission. National Development Plan: Vision for 2030.

75 Department of Environmental Affairs. *Long-Term Adaptation Scenarios Flagship Research Programme (LTAS) for South Africa*. (Pretoria: Department of Environmental Affairs, 2013.)

- Increased understanding of development objectives and relevant policy instruments for priority sectors, and enhanced coherence and synergy in adaptation planning.
- Increased knowledge transfer and information sharing including climate change data and projections, and sector-specific impacts between sector departments, academic and research institutions, the private sector, NGOs and civil society, and local government associations.
- A more coherent view of South Africa's climate change trends and vulnerabilities in primary sectors.

Figure 33 provides an overview of the Long-Term Adaptation Scenarios Flagship Research Programme components and **Figure 34** details the implementation roadmap for the programme.



A pair of wind turbines waiting for the sun to rise

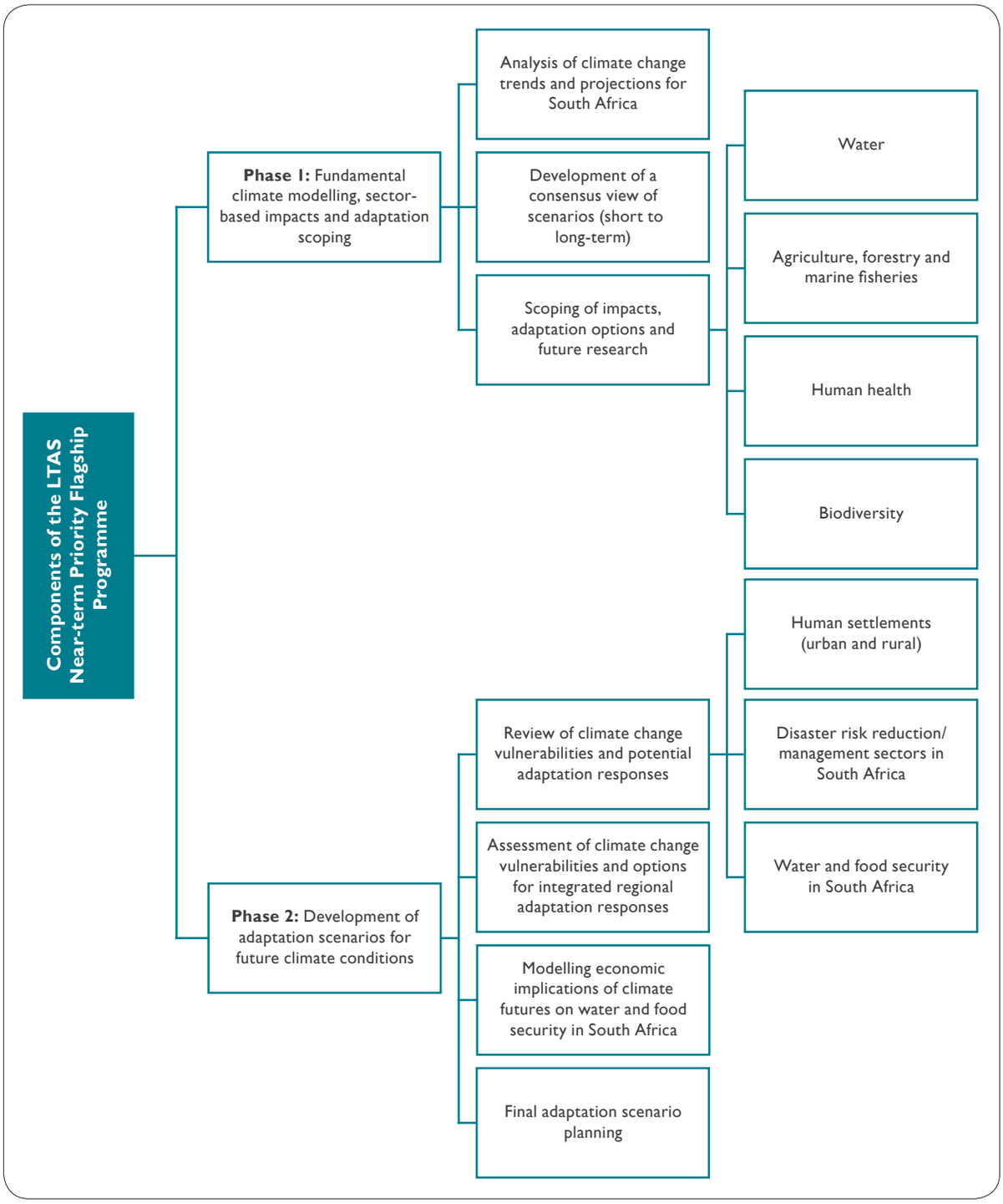


Figure 33: Components of the Adaption Research Near-term Priority Flagship Programme

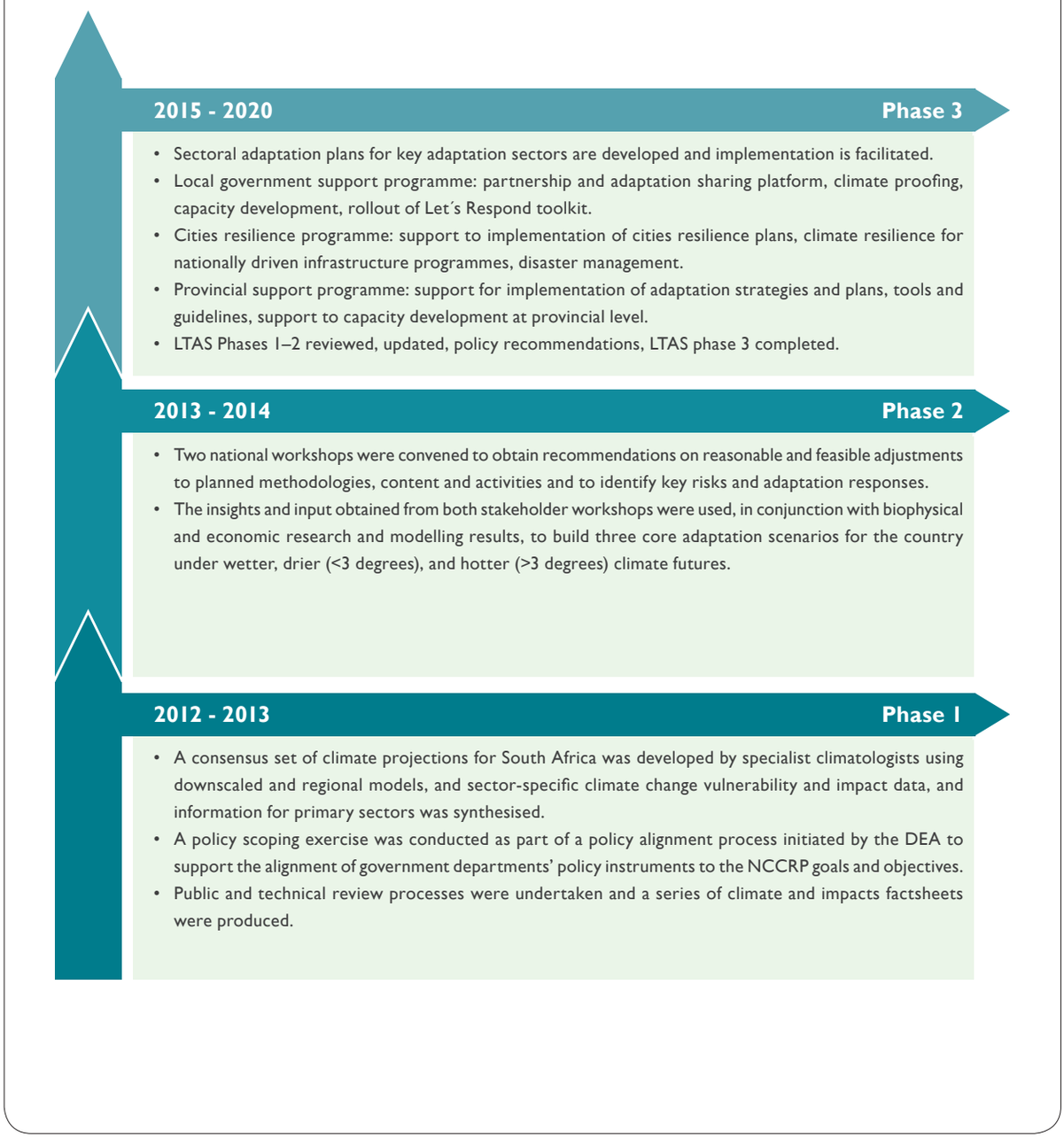


Figure 34: Long-Term Adaptation Scenarios Flagship Research Programme Roadmap

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Publishing date: August 2016

www.environment.gov.za