



**Western Cape
Government**
Environmental Affairs and
Development Planning

Western Cape Climate Change Response Strategy

February 2014

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ABBREVIATIONS

BRIP	Berg River Improvement Programme
CBD	Central Business District
CFR	Cape Floristic Region
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
CSAG	Climate Systems Analysis Group
DEADP	Department of Environmental Affairs and Development Planning
DEDAT	Department of Economic Development and Tourism
DMP	Disaster Management Plans
EPWP	Expanded Public Works Programme
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GJ	Gigajoule
IDP	Integrated Development Plans
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
M&E	Monitoring and Evaluation
MSP	Municipal Support Programme
MW	megawatt
NGO	Non-Governmental Organisation
NPAES	National Protected Areas Expansion Strategy
NSSD	National Strategy for Sustainable Development
PLTF	Provincial Land Transport Framework
ppm	parts per million
PSO	Provincial Strategic Objectives
PV	Photovoltaic
SDF	Spatial Development Framework
SIP	Strategic Infrastructure Projects
WCCCAD	Western Cape Climate Change Adaptation Database
WCDM	Western Cape Disaster Management

WCIF	Western Cape Infrastructure Framework
WCG	Western Cape Government
WC	Western Cape
UCT	University of Cape Town
UNFCCC	United Nations Framework Convention on Climate Change
UNESCO	United Nations Educational, Scientific and Cultural Organisation

EXECUTIVE SUMMARY

The Western Cape Government (WCG) recognises the urgency with which we all need to act locally – in a transversal, bold and pioneering manner and at unprecedented scale - to reduce our collective Greenhouse Gas (GHG) emissions and adapt to global climate change.

In contributing to global and national efforts to mitigate climate change and build resilience, the WCG proposes leading a collective strategic approach for the Western Cape and its people, which will reduce our carbon contribution and dependency, whilst enabling locally effective adaptation action to address the impacts of unavoidable climate change occurring now, and in future.

Building on the 2008 Western Cape Climate Change Response Strategy and Action Plan, the updated Strategy is newly aligned with the National Climate Change Response Policy and geared to strategically direct and mainstream climate change actions and related issues throughout relevant Provincial transversal agendas.

In line with the National Climate Change Response Policy, the Strategy takes a two-pronged approach to addressing climate change:

- **Mitigation:** Contribute to national and global efforts to significantly reduce GHG emissions and build a sustainable low carbon economy, which simultaneously addresses the need for economic growth, job creation and improving socio-economic conditions;
- **Adaptation:** Reduce climate vulnerability and develop the adaptive capacity of the Western Cape's economy, its people, its ecosystems and its critical infrastructure in a manner that simultaneously addresses the province's socio-economic and environmental goals.

The Strategy is a coordinated climate change response for the Western Cape Province and will guide the collective implementation of innovative projects as well as the search for opportunities that combine a low carbon development trajectory with increased climate resilience, enhancement of ecosystems and the services they provide, as well as economic growth and job creation.

A key component of the Strategy is to work better together by integrating climate action across all departments in the WCG and among other stakeholders, including all three spheres of government, civil society, business and industry, academia and research institutions. The focus of the Strategy is on pragmatic, locally implementable, programmatic approaches to address integrated climate change responses.

The overall approach to mitigation in the Western Cape encompasses

- setting performance benchmarks;
- identifying desired sectoral mitigation contributions;
- developing and implementing sustainable energy plans; and

- unlocking market opportunities and developing and implementing innovative economic instruments to achieve GHG emission reductions,

The Strategy prioritises the following climate change adaptation outcomes for the Western Cape Province

- well-managed natural systems that reduce climate vulnerability and improve resilience to climate change impacts;
- significantly increased climate resilience and coping capacity within communities which reduces climate-related vulnerabilities;
- an actively adaptive and climate change resilient economy which unlocks new markets and economic growth opportunities arising out of climate change.

In order to give effect to these outcomes, the Strategy prioritises the following actions:

- recognition and prioritisation of scaled and unprecedented climate response mechanisms as an integral component of provincial transversal growth and development programmes
- institutionalisation of and mainstreaming climate change response into government and other stakeholder structures, strategic plans and action plans
- ongoing collaborative research in order to
 - monitor changing conditions and provide and improve implementable local climate solutions
 - develop innovative ways, funding mechanisms and partnerships to effectively and pro-actively respond to changing climatic conditions
 - better understand the complexities inherent in these conditions

Select Focus Areas

The Strategy will be implemented with an initial focus on select areas supported by cross-cutting programmes and partnerships.

The select focus areas identified in the Strategy are:

- Energy Efficiency and Demand-Side Management
- Renewable Energy
- The Built Environment, including Critical Infrastructure, Human Settlements and Integrated Waste Management
- Sustainable Transport
- Water Security and Efficiency
- Biodiversity and Ecosystem Goods and Services
- Coastal and Estuary Management
- Food Security
- Healthy Communities

Cross-cutting programmes include communication, awareness raising, capacity building and education; financial models and mechanisms; and job creation.

The Strategy will be executed through an **implementation framework** which will include an institutional framework for both internal and external stakeholders, with a strong emphasis on partnerships.

A **monitoring and evaluation system** will also be developed to track the transition to a low carbon and climate resilient Western Cape Province. This system will

- provide a clear picture of the various climate change mitigation and adaptation responses
- assess the effectiveness of the response measures,
- measure the effectiveness and level of co-ordination of climate change responses across the Western Cape Province, and
- enable efficient participation and reporting into national, African and international climate change commitments and responses

Resource mobilisation needs to be informed by the mainstreaming of planning and decision-making of government, the private sector and civil society. This can be achieved by creating an enabling environment for climate resilient development, by promoting the green economy and consolidating and extending existing initiatives towards a climate resilient economy.

While climate change will post significant challenges to government and civil society into the future, the **Western Cape Climate Change Response Strategy 2014** creates an enabling framework through which significant new and emerging opportunities related to developing a low carbon, climate resilient Western Cape can be realised.

“Climate change is a reality and we would be irresponsible not to take action to reduce our impacts on and improve our resilience to the impacts of this phenomenon. While the Western Cape Government has driven the development of the enabling framework for responding to climate change, due to the scale and complexity of the challenge, we will not be able to achieve the required climate change response actions on our own. We therefore call all parties, including civil society, local governments, business and industry to commit to and collectively drive the implementation of the Western Cape Climate Change Response Strategy 2014. We are better together.”

Minister Anton Bredell

Minister of Local Government, Environmental Affairs and Development Planning

Western Cape Government

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1 INTRODUCTION

The opening statement of the IPCC¹ 5th Assessment Report, *Climate Change 2013: The Physical Science Basis*, states:

“Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gasses have increased”²

The IPCC report continues by stating that it is 95% sure that human influence is the dominant cause of the observed warming since the mid 20th century.

Observed change in average surface temperature 1901–2012

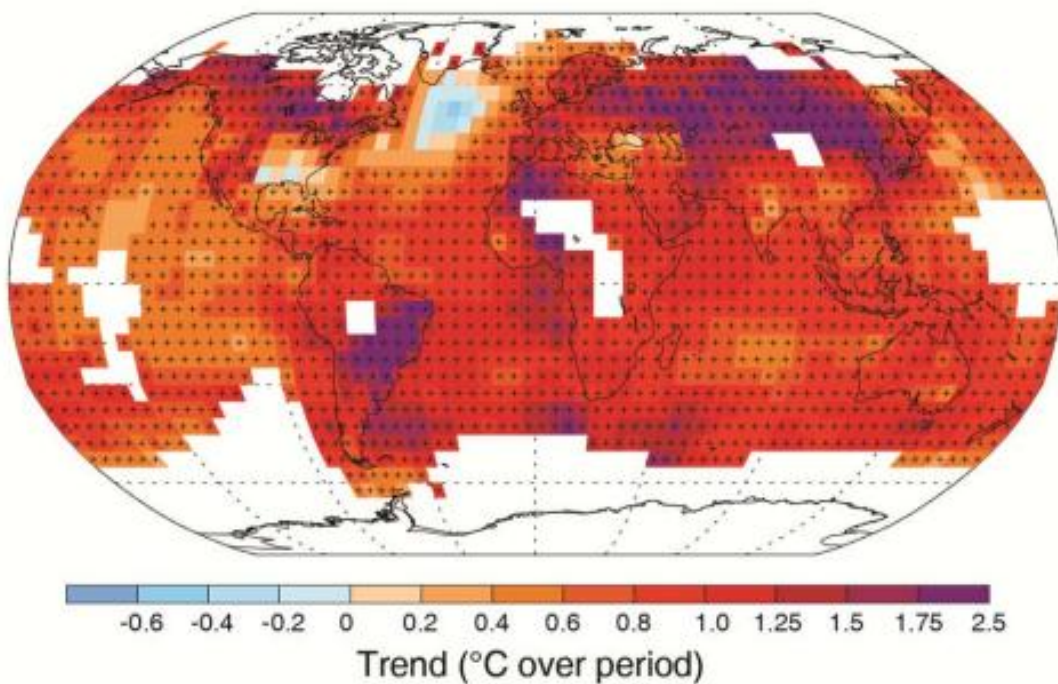


Figure 1: Global average surface temperature change (1901-2012)³

¹ The IPCC is the Intergovernmental Panel on Climate Change. The IPCC is a scientific intergovernmental body, set up at the request of member governments. It was first established in 1988 by two United Nations organizations, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP). Its mission is to provide comprehensive scientific assessments of current scientific, technical and socio-economic information worldwide about the risk of climate change caused by human activity, its potential environmental and socio-economic consequences, and possible options for adapting to these consequences or mitigating the effects.

² Working Group 1 Contribution to the IPCC Fifth Assessment Report. *Climate Change 2013: The Physical Science Basis*. Summary for Policy Makers

³ Working Group 1 Contribution to the IPCC Fifth Assessment Report. *Climate Change 2013: The Physical Science Basis*. Summary for Policy Makers

In recognition of the urgent need to act now to reduce greenhouse gas emissions and adapt to climate changes already being experienced, the Western Cape Government (WCG) recognises the need to contribute to global efforts to reduce its carbon dioxide and other greenhouse gas (GHG) emissions, particularly with a longer-term view to mitigating the effects of climate change. South Africa has committed itself to ambitious national carbon dioxide reduction targets to promote the step change towards a low-carbon economy. It is recognised that addressing climate change is crucial to the socio-economic growth and stability of the country and must be done in a way that does not compromise the natural resource base.

Equally significant, the WCG also recognises the need to adapt to the impacts of the unavoidable climate changes occurring in both the shorter and longer term. Historical methods of dealing with climate hazards will not be sufficient to cope with the frequency and magnitude of anticipated climate change impacts. Planning, preparedness, and innovation will therefore be required to maximise the province's adaptive capacity to this global threat. Taking action now will limit damages, loss of life, and costs over the coming decades and, if strategically well considered, will add to the Western Cape's global competitive edge into the future. Trade-offs in terms of provincial short term priorities may have to be made however, and it is imperative that these are made explicitly rather than realising unintended consequences in the future..

The Western Cape is especially vulnerable to climate change, being a winter rainfall area, as opposed to the other provinces in the country that are summer rainfall areas. The vegetation and agricultural conditions are therefore largely unique to the Province, resulting in a particular climate vulnerability which in some respects is different to the rest of the country. In most cases these changes threaten to amplify existing vulnerability entrenched within the socio-economic inequality characteristic of South Africa.

The climate projections for this region indicate not only a warming trend as with the rest of the country, but also projected drying in many areas, with longer time periods between increasingly intense rainfall events. The latter is of particular concern to the already water stressed Province. These broad projections raise the risk profile of the Province which is already vulnerable to droughts, floods and fire, thus posing a significant service delivery challenge to the WCG and municipalities. In addition to this, the Western Cape is a coastal province, with a coastline spanning approximately 900km, leaving it vulnerable to storm surges and sea level rise.

For a province that is characterised by a service-based economy, coastal vulnerability poses a significant risk to tourism, coastal properties and infrastructure, and fisheries-based livelihoods. From an economic perspective, the agricultural sector in the Western Cape is responsible for approximately 20% of agriculture production in South Africa from a base of 12.4% of South Africa's total available agricultural land, and between 55% and 60% of the country's agricultural exports

valued at more than R7 billion per annum⁴. Climate change poses a significant threat to this climate dependent sector, which in turn raises food security and employment concerns.

There are also, however, opportunities for the Western Cape associated with addressing climate change. The recently adopted Western Cape Green Economy Strategy Framework highlights some of these initiatives including using the need to create a low carbon economy to develop a stronger, more climate resilient economy through focusing not only on new products, services, and technologies, but also on how businesses and organisations operate. The Strategy outlines new ways of addressing energy security and enabling citizens to use safer forms of energy, as well as identifying investment cases for the realisation of these and other climate related priorities. There exists a window of opportunity for the Western Cape to access funding for energy efficiency, renewable energy, and climate change adaptation programmes. Additionally, climate change allows the Western Cape to review the spatial layout and organise the infrastructure of our towns, cities and rural areas in order to reduce emissions and climate vulnerability. There is also an opportunity to mainstream climate change into decision-making with a focus on using finances more effectively, as well as developing and promoting partnership approaches to responding to climate change.

The National Climate Change Response Policy highlighted the need for all government departments to review all policies, strategies, legislation, etc. falling within their jurisdiction to ensure full alignment with the National Climate Change Response Policy. This alignment will allow for more effective interaction between provincial and national government and will ensure that there is alignment between national flagship programmes and provincial focus areas, enabling the provincial programmes to contribute to national targets. This also allows for access to national and international funding streams that will benefit South Africa as a whole.

This strategy document is an update of the 2008 Western Cape Climate Change Response Strategy and Action Plan. The document has been updated and reviewed to ensure alignment with the National Climate Change Response Policy. An implementation framework will be developed to support implementation.

The 2008 version of the strategy (see section 5.1), had a very strong adaptation focus. The review is designed to ensure that the Strategy is more balanced in terms of its approach to both adaptation and mitigation. In addition the Strategy promotes a more integrated approach to climate change response implementation.

Furthermore, the Strategy aims to better direct climate change adaptation and mitigation in the Western Cape in a manner that promotes integration of climate change related issues throughout all relevant provincial transversal agendas.

⁴ Agriculture Sector Brief 2005/2006. Optimising the Productivity and Sustainability through LandCare Area wide Planning. Online available URL [www.wesgro.org.za]

Lastly, the reviewed Strategy allows for more effective identification and assignment of roles and responsibilities for implementation.

2 PROBLEM FRAMING – GLOBAL CLIMATE CHANGE

Since the beginning of the Industrial Revolution, atmospheric concentrations of greenhouse gasses (GHG) have risen, with carbon dioxide (CO₂) emissions increasing from 280 to around 400 parts per million (ppm). An increase in GHGs causes an increase in global temperatures through a phenomenon commonly referred to as the 'greenhouse effect'. Although GHGs occur naturally in the atmosphere, the increase in GHG concentrations over the recent past is significantly higher than that typically associated with natural processes. This marked increase has been primarily attributed to human activities, such as the burning of fossil fuels to generate energy and provide for transport, the release of methane from landfill sites, farm animals and paddy rice farming, the release of CO₂ from cement production and the reduced absorption of CO₂ through deforestation⁵. Similarly, while periods of global cooling and warming occur due to naturally occurring cycles over long time scales, further increases in GHG levels will likely lead to global warming on an unprecedented scale and rate. On-going global carbon emissions are projected to increase the mean average global surface temperature by 2-3°C or even higher by 2100. Temperature records show that 2001–2012 were all among the top 13 warmest years on record⁶.

Of major concern is that despite global efforts to curb and reduce greenhouse gas emissions, energy-related CO₂ emissions have reached an historic high. Additionally, atmospheric CO₂ concentrations are increasing at an alarming rate, with no signs of slowing or abating over the next 20 to 30 years⁷. Figure 2 shows the global temperature and CO₂ concentrations for the last 400 000 years and highlights the significant spikes in CO₂ in last 100 years. Efforts to alter this trajectory will be further hampered by future global emissions from fossil fuel power stations either planned or currently under construction, locking us into an increasing GHG emissions pathway for the foreseeable future. According to the International Energy Agency estimates, 80% of projected emissions from the power sector in 2020 are already locked in (IEA, 2011).

⁵ Working Group 1 Contribution to the IPCC Fifth Assessment Report. *Climate Change 2013: The Physical Science Basis*. Summary for Policy Makers; European Union Commission, 2010

⁶ World Meteorological Organisation, press release 972, May 2013 URL [http://www.wmo.int/pages/mediacentre/press_releases/pr_972_en.html]

⁷ International Energy Agency, 2011; United Nations Framework Convention on Climate Change, 2011

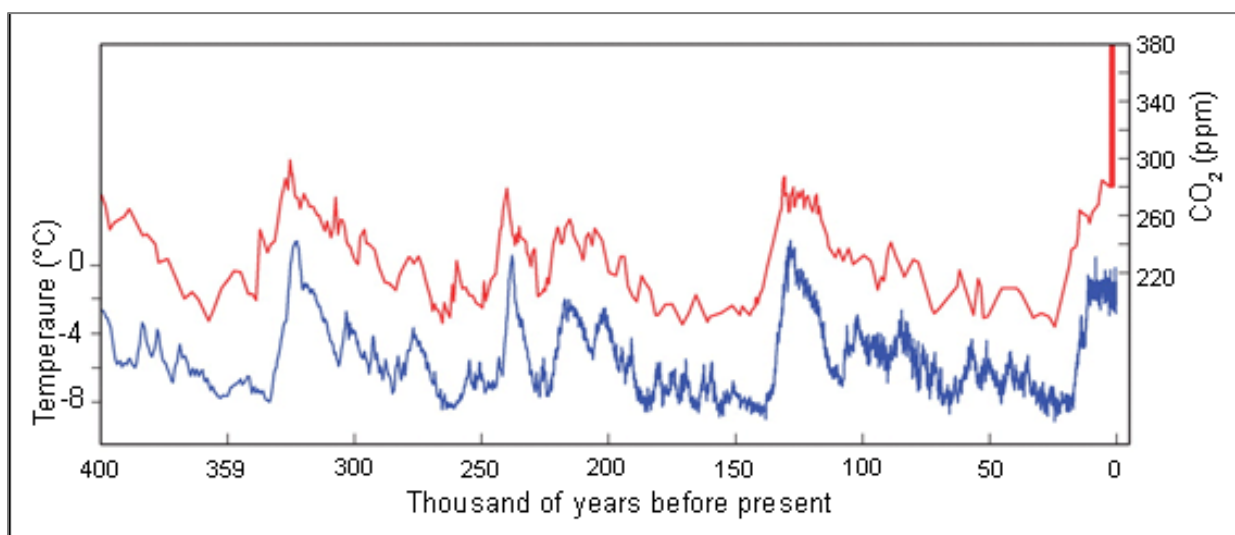


Figure 2: CO₂ concentrations and temperature over the last 400 000 years⁸

This shift in global temperature is already altering the world's climate, with effects already seen in the Western Cape. These are discussed further in the section below.

3 CLIMATE CHANGE IN THE WESTERN CAPE

3.1 Overview

South Africa is a country that contains both summer and winter rainfall regions, with the climate variability influenced by its geographic position, a large dynamic coastline framed by oceans and currents with differing temperatures and upwelling patterns, high mountain ranges, an inland plateau and vast areas of marginal semi-arid land. The Western Cape, which contains elements of all of the above geographical features, is no stranger to the effects of climate-related hazards, which pose a significant risk to the Western Cape's economy, ecosystems and population. Between 2003 and 2008 alone, direct damage costs associated with climate related extreme events in the Western Cape amounted to approximately R 3 161.1 million⁹. The 2009/10 Eden District drought damage was estimated at R300 million, the 2011 Eden District floods estimated at R350 million and the 2012 floods estimated at R500 million. These damages place a significant financial burden on service delivery, without taking into account the indirect costs of social, environmental and other disruptive impacts that typically characterise such events. The impacts associated with the future climate projections for the region will result in this burden increasing, particularly if climate vulnerability is not reduced across the province. Already a significant portion of the ecological infrastructure which should buffer against climate-related hazards, such as coastal barrier dunes, wetlands, and flood plains is compromised. Increasing magnitude and frequency of extreme events, temperature increases, altered rainfall patterns and changes in

⁸ US Environmental Protection Agency, URL [<http://www.epa.gov/climatechange/science/pastcc.html>]

⁹ RADAR Western Cape, 2010. Disaster Mitigation for Sustainable Livelihoods Programme

evaporation rates, etc., will further compromise the ability of the natural environment to buffer humans and human settlements against the impacts of climate hazards.

The percentage of global governments' Gross Domestic Product (GDP) being consumed by recovering from climate related disaster could, according to the Stern Review (2006), increase to between 5% and 20% by 2100¹⁰. Against the backdrop of the socio-economic challenges faced by the country and the province, such increased disaster recovery costs pose a significant risk to the achievement of the Western Cape's growth and development goals (including those related to job creation).

Short, medium and long term adaptation interventions designed to ensure that the Western Cape does not compromise its growth and development strategy are, therefore, critical to ensuring reduced vulnerability to the impacts of climate variability and climate change across the Province.

3.2 Climate Change Projections

A study by the Climate Systems Analysis Group (CSAG) at the University of Cape Town (UCT) (2008) modelled the impact of the expected climate change for the Western Cape for the 2030 - 2045 period¹¹. The following climate changes are projected.

Table 1: Climate change projections and examples of potential impacts for the Western Cape

Projection	Example of Possible Impacts
Higher mean annual temperature	<ul style="list-style-type: none"> • Increased evaporation and decreased water balance; • Increase wild fire danger (frequency and intensity).
Higher maximum temperatures, more hot days and more heat waves	<ul style="list-style-type: none"> • Heat stress on humans and livestock; • Increased incidence of heat-related illnesses; • Increased incidence of death and serious illness, particularly in older age groups; • Increased heat stress in livestock and wildlife; • Decreased crop yields and rangeland productivity; • Extended range and activity of some pests and disease vectors; • Increased threat to infrastructure exceeding design specifications relating to temperature (e.g. traffic lights, road surfaces, electrical equipment, etc.); • Increased electric cooling demand increasing pressure on

¹⁰ Stern Review: The Economics of Climate Change – a leading international assessment of the effects of climate change, 2006

¹¹ The timeline parameter for the response strategy is the 2030 – 2045 period. 2030 is the earliest anchor year to which climate change projections can realistically be scaled back from global climate models, which look at 2045 and beyond. 2030 is also a time horizon within which policy, economic and business decisions can realistically be made.

	<p>already stretched energy supply reliability ;</p> <ul style="list-style-type: none"> • Exacerbation of urban heat island effect.
Higher minimum temperatures, fewer cold days and frost days	<ul style="list-style-type: none"> • Decreased risk of damage to some crops and increased risk to others such as deciduous fruits that rely on cooling period in autumn; • Reduced heating energy demand; • Extended range and activity of some pests and disease vectors; • Reduced risk of cold-related deaths and illnesses.
General drying trend in western part of the country	<ul style="list-style-type: none"> • Decreased average runoff, stream flow; • Decreased water resources and potential increases in cost of water resources; • Decreased water quality; • Decrease in shoulder season length threatening the Western Cape fruit crops; • Increased fire danger (drying factor); • Impacts on rivers and wetland ecosystems.
Intensification of rainfall events	<ul style="list-style-type: none"> • Increased flooding; • Increased challenge to stormwater systems in urban settlements; • Increased soil erosion; • Increased river bank erosion and demands for protection structures ; • Increased pressure of disaster relief systems; • Increased risk to human lives and health; • Negative impact on agriculture such as lower productivity levels and loss of harvest.
Increased mean sea level and associated storm surges	<ul style="list-style-type: none"> • Salt water intrusion into ground water and coastal wetlands; • Increased storm surges leading to coastal flooding, coastal erosion and damage to coastal infrastructure; • Increased impact on estuaries and associated impacts on fish and other marine species.

As is evident in a number of the above listed projections, there is a risk of drier conditions across the province as a whole on the 40 year time horizon. In contrast, however, historical trends and some downscaled projections suggest that western and southern mountain ranges could experience wetter conditions. This apparent contradiction serves to highlight the complexity of climate drivers and responses, which in turn illustrates the inherent difficulties faced by decision makers when required to plan for climate resilience into the future. The complexity highlights the need for adaptive and flexible responses to climate variability and change that are not focused on fixed timescales or unidirectional change.

4 THE NATIONAL STRATEGIC CLIMATE CHANGE CONTEXT

A number of national policies, strategies and plans have relevance to climate change and have therefore been considered in the development of the Western Cape Climate Change Response Strategy 2014 in order to ensure alignment. Three of these (highlighted below) are particularly relevant and provide an understanding of national government's climate change focus areas and priorities going forward.

4.1 The National Climate Change Response Policy

The National Climate Change Response Policy, which was released as a White Paper in October 2011, presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. South Africa's response to climate change has two objectives.

1. Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity;
2. Make a fair contribution to the global efforts to stabilise GHG concentrations in the atmosphere at a level that avoids dangerous anthropogenic interferences with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

The National Climate Change Response Policy highlights eight near-term Priority Flagship Programmes that will be undertaken in the immediate future. These include:

- The Climate Change Response Public Works Flagship Programme;
- The Water Conservation Flagship Programme;
- The Renewable Energy Flagship Programme;
- The Energy Efficiency and Energy Demand Flagship Programme;
- The Transport Flagship Programme;
- The Waste Management Flagship Programme;
- The Carbon Capture and Sequestration Flagship Programme; and
- The Adaptation Research Flagship Programme.

The National Climate Change Response Policy includes the development of a Monitoring and Evaluation System that will serve as the national tracking and reporting structure for South African climate change responses.

4.2 The National Development Plan

The National Development Plan, developed by the National Planning Commission, aims to eliminate poverty and reduce inequality by 2030. It also highlights climate change as one of the key responses and acknowledges South Africa's role as a contributor to GHG emissions. In addition, it notes that we are particularly vulnerable to the effects of climate change on health,

livelihoods, water and food with a disproportionate impact on the poor, especially women and children.

Chapter 5: *Environmental Sustainability and Resilience*, which focuses on ensuring environmental sustainability and an equitable transition to a lower carbon economy, includes a number of objectives and actions which are specifically linked to climate change. These include:

- Achieve the peak, plateau and decline trajectory for GHG emission, with the peak being reached around 2025;
- By 2030, an economy-wide carbon price should be entrenched;
- Carbon price, building standards, vehicle emissions, standards and municipal regulations to achieve scale in stimulating renewable energy, waste recycling and in retrofitting buildings;
- Carbon pricing mechanisms, supported by a wider suite of mitigation policy instruments to drive energy efficiency;
- Zero emission building standards by 2030;
- All new buildings to meet the energy efficiency criteria set out in SANS 204;
- Absolute reductions in the total volume of waste disposed to landfill each year;
- At least 20 000 MW of renewable energy should be contracted by 2030;
- 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;
- Channel public investment into research, new agricultural technologies for commercial farming as well as for the development of adaptation strategies and support services for small-scale and rural farmers.
- An independent Climate Change Centre in partnership with academia and other appropriate institutions, to be established by government to support the actions of government, business and civil society;
- Put in place a regulatory framework for land use, to ensure conservation and restoration of protected areas;

There are also strong climate change links with other chapters in the National Development Plan, including Chapter 3: *Economy and Employment*, which includes a focus on the green economy, transition to a low carbon economy and society and fostering motivation in green product and service development; Chapter 4: *Economy Infrastructure*, which includes the efficient and effective implementation of the environmental impact management governance system for new developments and the implementation of the Strategic Infrastructure Projects (SIP's) proactive authorisation process. Chapter 6 focuses on the promotion of an integrated and inclusive rural economy and Chapter 8: *Transforming Human Settlements* focuses on green cities and sustainable development.

The long-term vision for the country will need to be implemented by all spheres of government and sectors of society in order to achieve the goals set forth in the document.

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

The National Strategy for Sustainable Development (NSSD 1) was approved by Cabinet on 23 November 2011. The strategy builds on the 2008 National Framework for Sustainable Development, which identified the strategic interventions required to re-orientate South Africa's development path towards a more sustainable direction. It is a proactive strategy that regards sustainable development as a long-term commitment and which combines environmental protection, social equity and economic efficiency with the vision and values of the country.

The following five strategic objectives are identified in the NSSD 1:

- Enhancing systems for integrated planning and implementation;
- Sustaining our ecosystems and using natural resources more efficiently;
- Towards a green economy;
- Building sustainable communities;
- Responding effectively to climate change.

As can be seen from the above mentioned strategic documents, there are a number of common threads that needed to feed into the Western Cape Climate Change Response Strategy 2014.

5 THE WESTERN CAPE STRATEGIC CLIMATE CHANGE POLICY CONTEXT

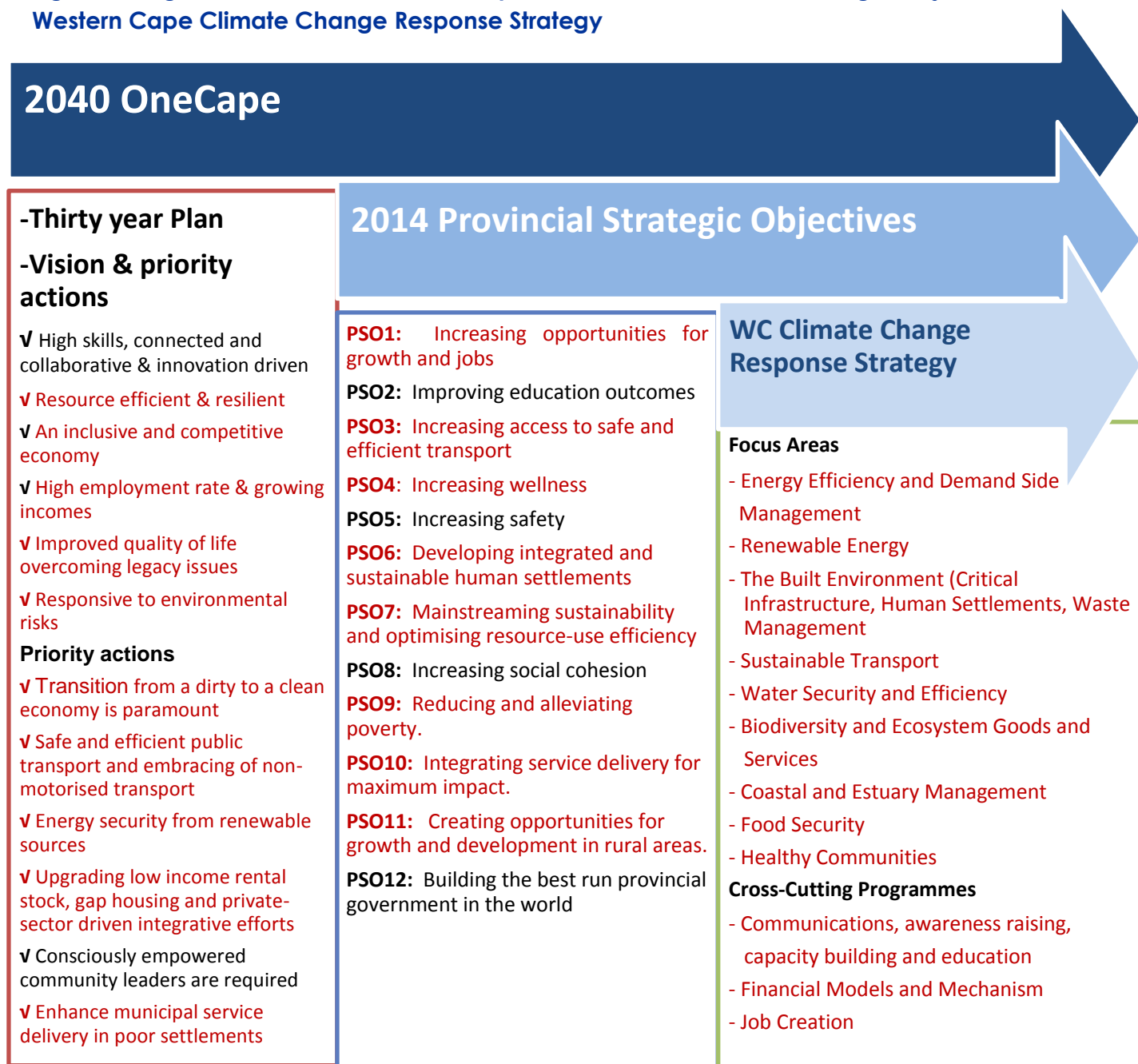
The Western Cape Province comprises five district municipalities, 24 local municipalities and one metropolitan area (Cape Town). The Province houses approximately 10% of South Africa's population, contributes approximately 10% to the country's GDP and accounts for approximately 10% of the country's energy consumption.

More than half of all provincial residents live in the City of Cape Town and the majority of the economic activity takes place in the City. This economy is based increasingly on the services sectors (relatively less energy intensive), some manufacturing, government services and construction. The West Coast District is home to large, energy intensive industrial activities focused on iron, steel and mining, that while contributing only 5% to provincial GDP account for 25% of the provincial energy consumption. The Cape Winelands and Eden Districts contribute economically in terms of light industry and agri-processing; with the rest of the province being increasingly rural in character. There are considerable climate change mitigation opportunities for the province and a great need for adaptation-based activities to address key concerns around extreme weather events, the growth of settlements, and the potential impacts on agriculture.

A number of provincial strategies, plans and frameworks have relevance to climate change and have been considered in the development of the Western Cape Climate Change Response Strategy 2014 in order to ensure alignment. These documents are discussed in the following sections. The Strategy is strongly aligned with the overarching provincial objectives as stated in the Western Cape Draft Strategic Plan (discussed in more detail in section 5.4). The Western Cape International Relations Strategy aims to position the Western Cape Government globally through

collaboration with key role players in BRICs, Africa and the rest of the World. Its three strategic goals include: the improvement of environmental resilience to climate change and increasing sustainability; the facilitation of trade and investment with emerging and developed regions; and the development of skills and best practices through knowledge sharing. The focus on addressing the strategic goal relating to climate change involves mitigating and adapting to climate change, decreasing environmental stress, managing resource constraints and reducing energy and water consumption.

Figure 3: Alignment between 2040OneCape Vision, 2014 Provincial Strategic Objectives and the Western Cape Climate Change Response Strategy



5.1 The Western Cape Climate Change Response Strategy and Action Plan (2008)

In 2008, the Department of Environmental Affairs and Development Planning (DEA&DP) released a Climate Change Response Strategy and Action Plan for the Western Cape. The response strategy and action plan was built on the following prioritised programmes:

- An integrated water supply and infrastructure management programme that integrates climate change and risks;
- Establishing clear links between land stewardship, livelihoods and the economy;
- Establishing focused climate change research and weather information programmes; and
- Reducing the province's carbon footprint, including energy efficiency, development of renewable and alternate sustainable energy resources, effective waste management strategies and cleaner fuels programmes for households and transport.

A number of climate change initiatives transpiring from this strategy have been implemented, including a roll-out of solar water heaters as part of the 2010 Soccer World Cup Green Goal Legacy programme, the promotion of conservation agriculture by the Department of Agriculture and the development of a Sustainable Water Plan for the Western Cape.

The 2008 Western Cape Climate Change Response Strategy and Action Plan was used as the basis for the development of this document.

5.2 OneCape 2040

OneCape 2040 is a deliberate attempt to stimulate a transition towards a more inclusive and resilient economic future for the Western Cape region. It articulates a vision about how all in the Western Cape can work together to develop the Province's economy and society. OneCape 2040 seeks to set a common direction to guide planning and action and to promote a common commitment and accountability to a sustained long-term process. The OneCape 2040 Vision is for a highly skilled, innovation driven, resource-efficient, connected, high opportunity and collaborative society. The transitions envisaged by OneCape 2040, many of which relate to responding to climate change, are outlined in the table overleaf.

Transition	From	To
Knowledge Transition (Educating Cape)	Unequal variable quality education plus limited innovation capacity	High quality education for all plus high innovation capacity
Economic Access Transition (Working Cape)	Factor and efficiency driven economy with high barriers to entry and low productivity and entrepreneurship rates	Innovation driven economy with low barriers to entry and with high productivity and entrepreneurship rates
Ecological Transition (Green Cape)	Unsustainable carbon-intensive resource use	Sustainable low carbon resource use
Cultural Transition (Connecting Cape)	Barriers to local and global connectivity (language, identity, distance, parochial and inward-looking attitude)	High level of local connectivity and global market fluency
Settlement Transition (Living Cape)	Unhealthy, low access, often alienated, low opportunity neighbourhoods	Healthy, accessible, liveable multi-opportunity communities
Institutional Transition (Leading Cape)	Defensive, adversarial structures	Open, collaborative systems

5.3 Green is Smart - Western Cape Green Economy Strategy Framework

'Green is Smart' sets out an agenda for how the Western Cape can become a global pioneer in the green economy and the leading green economic hub of the African continent. It is a framework for shifting the Western Cape economy from its current carbon intensive and resource-wasteful path with high levels of poverty to one that is smarter, greener, more competitive and more equal and inclusive.

Five drivers for the transition are identified (smart mobility, smart living & working, smart ecosystems, smart agri-processing, smart enterprise), along with five enablers (finance, rules & regulations, knowledge management, capabilities, infrastructure) that are needed to create the environment for the proposed new economic growth path. The strategic framework presents stakeholders with an opportunity to create a region with a sustainable future and the potential for consistent economic growth. There are also opportunities to use this growth to address the Western Cape's social exclusion and unemployment challenges. Such an economy is set to attract investment and retain people looking to visit, invest, work, live and study in the Western Cape. Importantly, the framework identifies priorities that would position the Western Cape as a pioneer and early adopter of green economic activity.

Climate Change is a key driver of the green economy and the priority activities in the Green Economy Strategy Framework support the implementation of the Climate Change Response Strategy and vice versa. The alignment between the two documents is important in addressing climate change responses and promoting the green economy.

5.4 Western Cape Draft Strategic Plan (2009 – 2014)

The Western Cape Draft Strategic Plan (2009 – 2014) outlines the 12 Provincial Strategic Objectives (PSOs) of the Western Cape Government. Structures have been established for the PSOs to ensure a system of transversal working across the province. Climate change has been identified as a priority focus area and PSO7 (Mainstreaming Sustainability and Optimising Resource-Use Efficiency) comprises a number of working groups that relate to climate change:

- Energy Work Group – to ensure sustainable energy systems and move towards a low carbon economy in the Western Cape;
- Climate Change Adaptation Work Group – to reduce vulnerability and increase coping capacity to climate risk within the communities, economy and ecosystems of the Western Cape;
- The Sustainable Resource Management Work Group – to implement programmes and projects towards managing our natural resources sustainably, without compromising ecosystem integrity
- The Land-Use Planning Work Group – to ensure coordinated and integrated land use planning throughout the province.

In addition, the Green Economy Work Group, which sits under PSO1 (Increasing Opportunities for Growth and Jobs), is focused on promoting the Green Economy in the Western Cape, of which climate change related objectives and projects are a significant focus. PSO11 (Creating Opportunities for Growth and Development in Rural Areas) deals with the development of the rural economy with clear links to climate change through the agriculture sector activities.

These work groups include representation from most WCG departments as well as local and national government and external stakeholders. Relevant input is also provided to all PSOs in the WCG to ensure that climate change is treated as a transversal issue and is addressed by all. It is anticipated that the PSOs will persist in the future.

5.5 Provincial Spatial Development Framework

The 2014 Review of the Western Cape Provincial Spatial Development Framework (PSDF), currently being finalised by DEADP, sets out to put in place a coherent framework for the Province's urban and rural areas, by focusing on a transversal system of spatial governance, the sustainable use of the Western Cape's assets, opening up opportunities in the Provincial space-economy and developing integrated and sustainable human settlements.

The chapter on *Sustainable Use of Provincial Assets* also supports the spatial priorities of the National Development Plan, 2012 for building environmental sustainability and resilience and it embraces the long term strategy of changing to a low carbon economy. The PSDF agenda in this regard encompasses:

- Safeguarding the biodiversity network and functionality of ecosystem services, a prerequisite for a sustainable future;
- Prudent use of the Western Cape's precious land, water and agricultural resources, all of which underpin the regional economy;
- Safeguarding and celebrating the Western Cape's unique cultural, scenic and coastal resources, on which the tourism economy depends;
- Understanding the spatial implications of known risks (e.g. climate change and its economic impact, sea level rise, flooding and wind damage associated with extreme climatic events) and introducing risk mitigation and/or adaptation measures.

As part of its Provincial Planning mandate and in line with the priority it has given to economic growth, the WCG is responsible for ensuring that the unique assets of the Western Cape are used sustainably. It also needs to safeguard against risks to assets of provincial and regional significance by mitigating and/or adapting to current and looming risks. If managed responsibly, the Province's spatial assets hold immense potential for socio-economic development. Conversely, mismanagement of these resources can severely hinder development, particularly of the rural areas of the Province.

5.6 Western Cape Sustainable Water Management Plan

The Sustainable Water Management Plan for the Western Cape Province (hereafter referred to as "the Water Plan") was developed in 2011. Its development was undertaken collaboratively by the Western Cape Government's Provincial Departments and the National Department of Water Affairs: Western Cape Regional Office. Short (1-5 years), medium (6-15 years) and long term (+16 years) actions to guide the implementation of projects / activities were developed as a means of achieving integrated and sustainable management of water in the Western Cape to support the growth and development needs of the region without compromising ecological integrity. The Water Plan therefore aims to protect water resources from environmental degradation, incorporate integrated planning processes, and promote efficient water utilisation in the Western Cape Province.

The vision of the Water Plan will be achieved by the following substantive principles:

- Efficiency in water utilisation across all sectors;
- Ensuring a safe environment and clean water;
- Ensuring sustainable integrity of ecological diversity and systems.

The following four strategic goals were identified as key to achieving the vision of the Water Plan:

- Ensure effective co-operative governance and institutional planning for sustainable water management;
- Ensure the sustainability of water resources for growth and development;

- Ensure the integrity and sustainability of socio-ecological systems;
- Ensure effective and appropriate information management, reporting and awareness-raising of sustainable water management.

5.7 Provincial Land Transport Framework

The Provincial Land Transport Framework (PLTF) informs all transport and land-use related provincial decision-making with respect to transport infrastructure development, management and investment, public transport, non-motorised transport, freight transport, land transport safety and guides district wide and local integrated transport planning.

The PLTF aims to achieve this by taking cognisance of the complex inter-relations and interactions between the transport sector and the various components of human settlements, society, the economy and the natural environment.

The PLTF has six objectives:

- An efficient, accessible and integrated multi-modal public transport system managed by capacitated and equipped municipal authorities;
- Non-Motorised transport (NMT) as a pivotal part of all forms of transport planning in urban and rural areas;
- A well maintained and preserved public transport system;
- A sustainable transport system;
- A safe transport system;
- A transport system that supports the Province as a leading tourist destination.

5.8 Western Cape Infrastructure Framework

The Western Cape Government is mandated to coordinate provincial planning under Schedule 5A of the Constitution. As part of this mandate, the Western Cape Infrastructure Framework (WCIF) has been developed by the Provincial Transport and Public Works Departments, in order to align the planning, delivery and management of infrastructure, provided by all stakeholders (national government, provincial government, local government, parastatals and the private sector), to the strategic agenda and vision for the Province.

The objectives of the framework are to:

- Align existing planning processes;
- Outline strategic decisions and trade-offs that need to be made to achieve the Provincial 2040 vision in a complex and changing environment;
- Identify and guide the planning and execution of major infrastructure interventions for the period 2012–2040;
- Mobilise and direct new investments;

- Facilitate partnerships and collaboration.

Given the status quo of infrastructure in the province, and the changing and uncertain world facing the Western Cape over the next 28 years, a new approach to infrastructure is needed: one that satisfies current needs and backlogs, maintains the existing infrastructure, and plans proactively for a desired future outcome. The 2040 vision requires a number of transitions to shift fundamentally the way that infrastructure is provided and the *type* of infrastructure that is provided in the Western Cape.

The high-level results of the analysis transitions for each infrastructure system, which all relate to the Western Cape climate change response, are:

Energy

- Introduce natural gas processing infrastructure to use gas as a transition fuel;
- Promote the development of renewable energy plants in the province and associated manufacturing capability;
- Shift transport patterns to reduce reliance on liquid fuels.

Water

- Have more stringent water conservation and demand-management initiatives, particularly at municipal level;
- Develop available groundwater resources;
- Adopt more widely the re-use of wastewater effluent as standard practice;
- Adopt large-scale desalination once it becomes the “next best” option to resolve inevitable water shortages in Saldanha, Cape Town and the Southern Cape;
- Expand and diversify agriculture to increase availability of surface water but reduce the water intensity of the sector, given the limited availability of water for irrigation.

Transport

- Invest in public transport and non-motorised transport infrastructure, particularly in larger urban centres;
- Prioritise general freight rail over bulk freight;
- Shift freight traffic from road to rail along major routes.

Settlements

- Continue to provide basic services to achieve national targets;
- Diversify the housing programme, with greater emphasis on incremental options;
- Integrate settlement development, prioritising public service facilities in previously neglected areas;
- Improve energy efficiency in buildings by applying design standards;
- Consolidate management of state land and property assets for optimal use;
- Distribute health and education facilities equitably;
- Innovate in the waste sector to increase recycling and re-use, including the adoption of waste-to energy in the longer term.

ICT

The availability of a strong broadband infrastructure network is central to efficient communications and internet services and will play a key role in achieving the provincial objectives.

6 WESTERN CAPE CLIMATE CHANGE RESPONSE APPROACH

In line with the National Climate Change Response Policy, the Strategy takes a two-pronged approach to addressing climate change.

1. **Adaptation:** To reduce the climate vulnerability, and develop the adaptive capacity of the Western Cape's economy, its people, its ecosystems and its critical infrastructure in a manner that simultaneously addresses the province's socio-economic and environmental goals;
2. **Mitigation:** To contribute to national and global efforts to significantly reduce GHG and build a sustainable low carbon economy which simultaneously addresses the need for economic growth, job creation and improving socio-economic conditions.

The Strategy is developed as the coordinated climate change response for the Western Cape. In addition, it aims to guide the implementation of innovative projects and the search for opportunities that combine a low carbon development trajectory with increased climate resilience, enhancement of ecosystems and the services they provide, and economic stability and growth.

Many external stakeholders have contributed to the development of the Western Cape Climate Change Response Strategy as much of the work being done in the climate change space occurs outside of government structures. A key component of the Strategy is to encourage work in an integrated fashion across all departments in the WCG as well as with other stakeholders, including local authorities, other government departments, civil society, academia and research institutions, and business. There is a strong move towards programmatic approaches that seek to integrate adaptation and mitigation responses.

7 CLIMATE CHANGE MITIGATION

7.1 Overall Approach to Mitigation

The goal of the WCG's PSO7 Energy Work Group is to "ensure sustainable energy systems and move towards a low carbon economy in the Western Cape." This mitigation approach mirrors the mitigation approach reflected in the National Climate Change Response Policy and encompasses:

- **Setting the performance benchmark** – defining baselines and what targets need to be put in place;
- Identifying **desired sectoral mitigation contributions** – which sectors are key to work with in the short term and how will these sectors be supported in the development of emission reduction outcomes;

- Working with municipalities and other stakeholders across the province to **develop sustainable energy plans and programmes** that will lead to the achievement of targets for energy and emissions reductions, as well as addressing issues of energy poverty;
- **Investigating opportunities to use the markets and economic instruments** to support the system of desired emission reduction outcomes; and
- **Monitoring and evaluation** of strategic actions.

The following sections will highlight the Western Cape energy and CO₂e emissions profile, the way forward with modelling the Western Cape emissions trajectory as well as the mitigation potential for the Western Cape.

7.2 Western Cape Energy and Emissions Profile

An energy consumption and CO₂e emissions database was developed for the Western Cape that included breakdown profiles of the province by fuel types, sectors and district municipalities. The year 2009 was used as a baseline as this is the most recent year for which a full set of liquid fuels data is available.

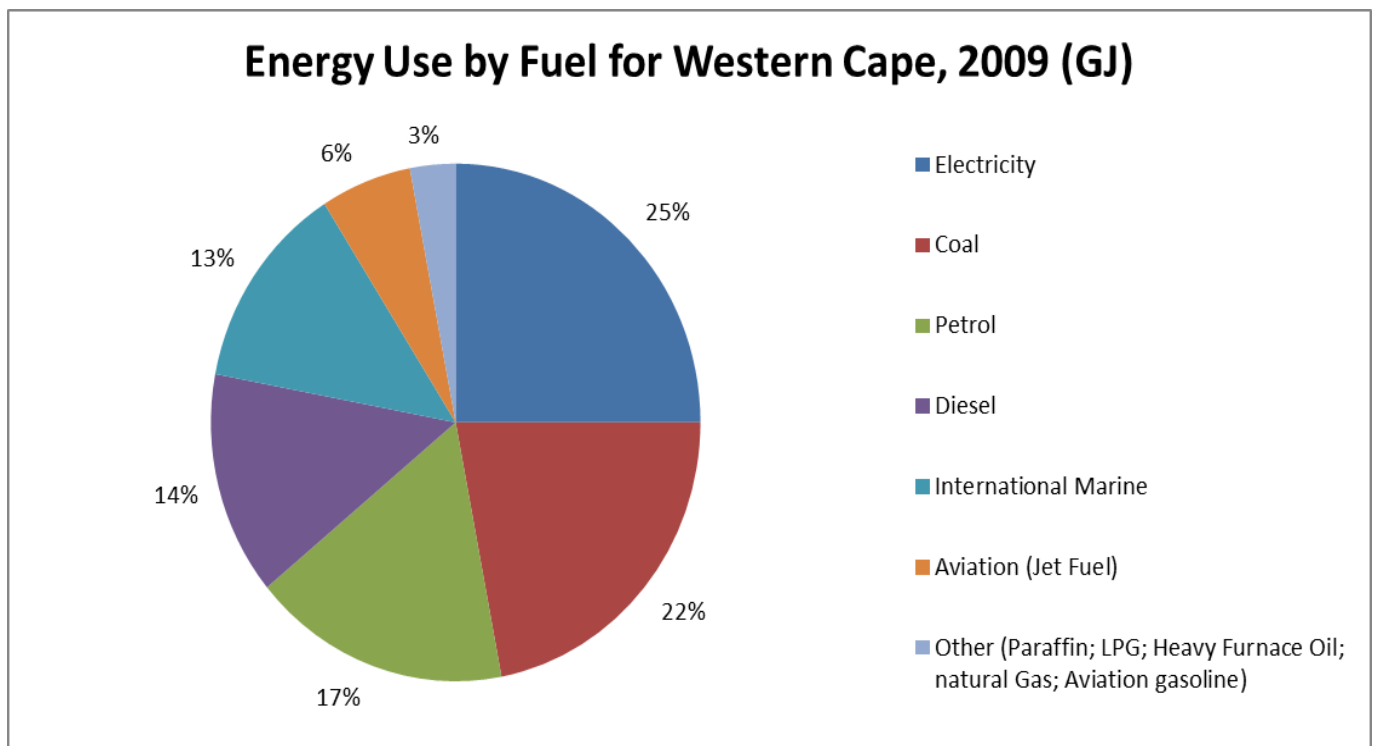


Figure 4: Energy use by fuel type for the Western Cape (2009)¹²

Electricity, coal¹³, petrol, and diesel dominate the mix of fuel consumed in the province, in that order (Figure 4). International marine and aviation fuels contribute significantly to province fuel

¹² Source: Western Cape Energy Consumption and CO₂ emissions database (January, 2013)

consumption (13% and 6% respectively). Until recently, with the protocols developed relating to emissions reporting, these fuels were not included in local energy studies, but were rather considered as part of the national or international responsibility. Comparing energy use to energy emissions by fuel type (Figure 5) shows the over proportional contribution of electricity to the Western Cape's emissions profile. This supports the case for the shift towards renewables and other cleaner energy types.

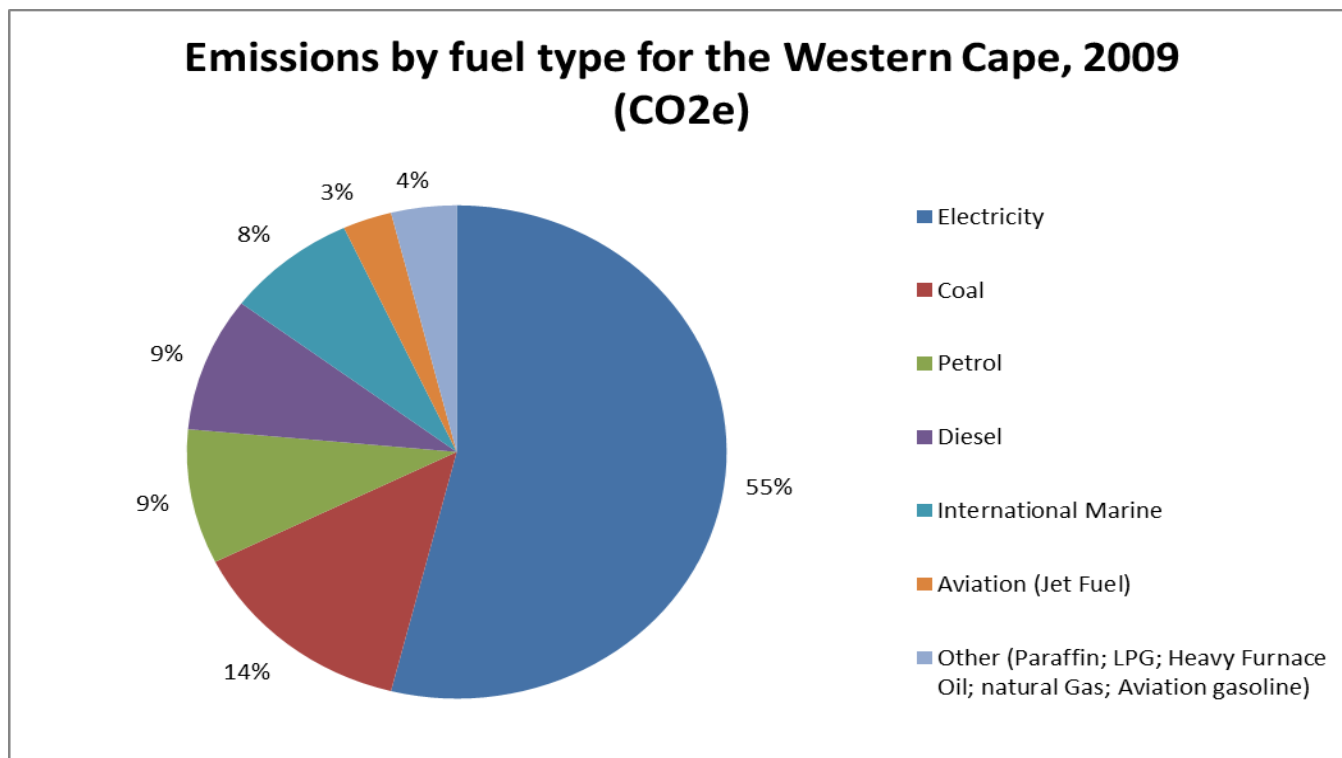


Figure 5: Emissions by fuel type for Western Cape (2009)¹⁴

This fuel picture demonstrates an enormous reliance on fossil fuel in the province. Electricity is taken to be similar in proportion to the national mix, which is approximately 95% low-grade coal-fired generation, and 5% nuclear; and, apart from the nuclear and peaking stations, is brought in from the north of the country. Over 30% of the liquid fuel is derived from oil/coal/gas, which

¹³ Coal in this context is the direct use of coal (predominantly by industrial activities) rather than coal being used to generate electricity by Eskom.

¹⁴ Source: Western Cape Energy Consumption and CO₂ emissions database (January, 2013)

represents a dependence on foreign oil imports. This obviously renders the province vulnerable to disruptions in fairly long supply lines. Direct use of coal in industry contributes sizeably to the provincial energy consumption picture.

Across the province, the transport sector is responsible for the largest proportion (53%) of energy use, followed by industry at 33% (Figure 6). Although the residential sector is only responsible for some 8% of energy consumption, it is responsible for 18% of the emissions for the Western Cape (Figure 7), again showing the carbon-intensive nature of the South African electricity supply.

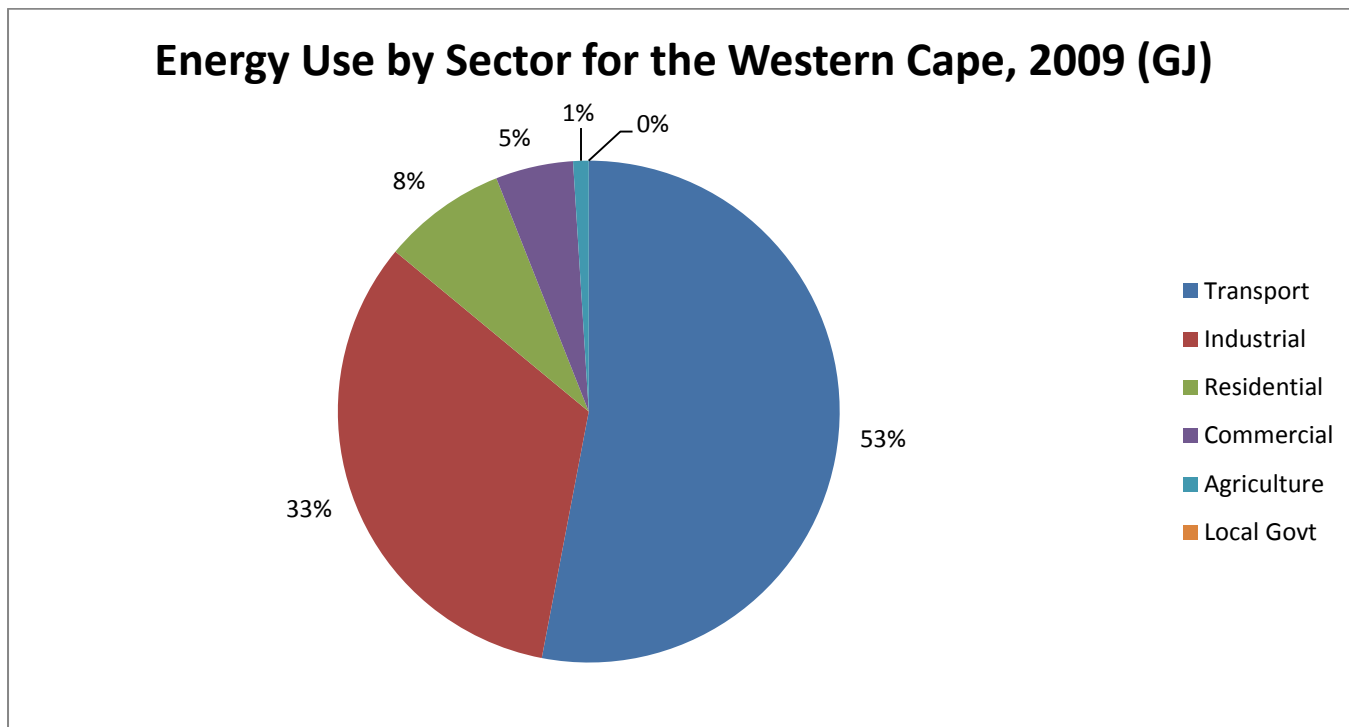


Figure 6: Energy use by sector for the Western Cape, 2009¹⁵

¹⁵ Source: Western Cape Energy Consumption and Emissions Database (January, 2013)

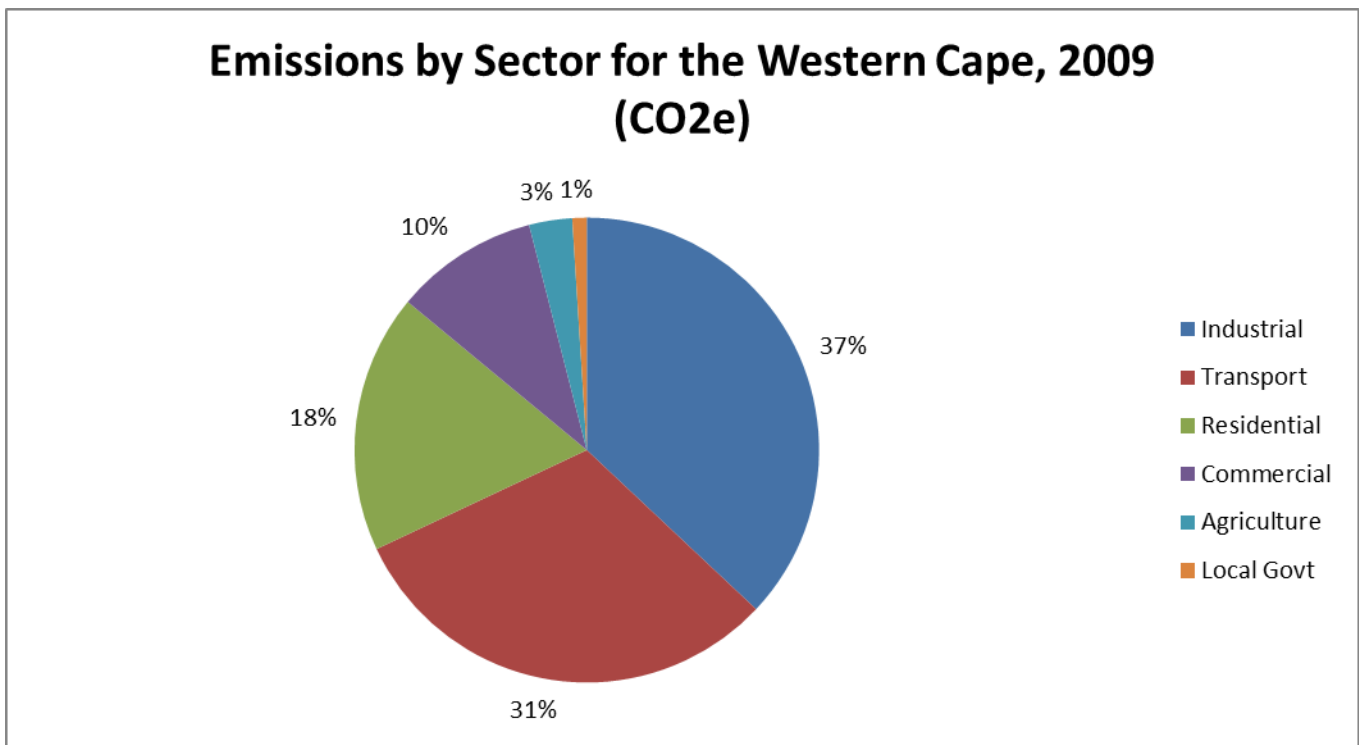


Figure 7: Emissions by Sector for the Western Cape, 2009¹⁶

7.3 Modelling the Western Cape Emissions Trajectory

At a national level the GHG emissions trajectory range has been modelled and agreed to in terms of the following: South Africa's emissions should peak in the period from 2020 to 2025, remain stable for around a decade, and decline thereafter in absolute terms.

In order for the Western Cape to support the achievement of this national trajectory, the Western Cape's energy and GHG emission reduction targets need to be aligned with the national trajectory and its short, medium and long-term actions designed to contribute towards this trajectory. As a first step, work is required to quantify the impacts of existing projects in order to determine how best to support the achievement of targets in the Western Cape context.

A long-term energy and CO₂ modelling exercise for the Western Cape will be undertaken in order to determine the energy and emissions trajectory for the province. This modelling exercise will include a number of different scenarios around the implementation of demand-side and supply-side programmes / interventions in order to determine the type and scale of interventions required by the WCG and other stakeholders.

¹⁶ Source: Western Cape Energy Consumption and CO₂ emissions database (January, 2013)

7.4 Mitigation Potential in the Western Cape

The majority of the Western Cape's emissions arise from energy generation (electricity and liquid fuels) and use (industry and transport), and mitigation actions therefore need to focus on these areas.

The main opportunities for mitigation include energy efficiency, demand-side management and moving to a less emissions-intensive energy mix. The consequent economic benefits include improved efficiency and competitiveness as well as incentivising economic growth in sectors with lower energy intensities. The WCG will also investigate the Carbon Budget¹⁷ approach that is being used at a national level to determine how this can be supported in the Western Cape.

Policy decisions on new infrastructure investments must consider climate change impacts to avoid the lock-in of emissions-intensive technologies into the future. However, in the short-term, due to the age of existing infrastructure and the planning around new infrastructure, the most promising mitigation options are primarily energy efficiency and demand-side management, coupled with increasing investment in a renewable energy programme in the electricity sector.

A mix of economic instruments, including market-based instruments such as carbon taxes and emissions trading schemes, and incentives, complemented by appropriate regulatory policy measures, are essential for driving and facilitating mitigation efforts across a wide range of key economic sectors. Although these will be implemented at a national level, the WCG will need to understand the implications of these for the Western Cape in order to ensure their implementation aids rather than negatively impacts Western Cape based businesses and residents.

In the short/medium term, the mitigation options with the biggest mitigation potential for the Western Cape are:

- Significant upscaling of energy efficiency application, especially industrial energy efficiency and energy efficiency in public, commercial and residential buildings and in transport;
- Promoting smart-mobility / transport-related interventions including transport modal shifts (road to rail, private to public transport, non-motorised transport (active mobility)), switches to alternative vehicles (electric and hybrid vehicles) and lower-carbon fuels and the promotion of telecommuting / flexible working;

¹⁷ Carbon Budget approach will identify an optimal combination of mitigation actions at the least cost to- and with the most sustainable developments benefits for the relevant sector and national economy to enable and support the achievement of the desired emission reduction outcomes consistent with the benchmark National GHG Emissions Trajectory range.

- Supporting the implementation of programmes that can transition society and the economy to more sustainable consumption and production patterns, including the development of more sustainable communities; and
- Promoting renewable energy in the form of both small-scale embedded generation as well as large scale renewable energy facilities.

Long-term planning, information on the outcomes of mitigation options, technology development and other new information, may identify additional mitigation actions in due course.

The socio-economic benefits of the mitigation activities include:

- Reducing fuel costs to households and business;
- Improving the competitiveness of businesses;
- Job creation opportunities with the development of new economic sectors;
- Local business development;
- Improved air quality (with positive health impacts);
- Reducing the negative impact of large carbon footprints, particularly for export products;
- Reducing stress on energy needs of the province and thereby increasing energy security.

Key areas with high mitigation potential for the Western Cape will feed into the identification of actions to meet the WC Energy Work Group targets.

8 CLIMATE CHANGE ADAPTATION

8.1 Climate Change Adaptation Outcomes

The envisaged climate change adaptation outcomes for the province are as follows:

- Natural systems that reduce climate vulnerability and improve resilience to climate change impacts;
- Reduced climate vulnerability and increased coping capacity within communities across the province;
- An actively adaptive and climate change responsive economy ready to take advantage of opportunities arising out of climate change, as well as reducing losses.

These often interlinked and interdependent outcomes can only be achieved through multiple strategic partnerships, across scales and spheres of government, between actors in the public, private and civil society sectors, and between researchers, strategists and operational implementers.

8.2 Overall Approach to Adaptation: Dealing with Complexity and Uncertainty

Adapting to the impacts of climate induced hazards and responding to opportunities presented by a changing climate across the province is complex for a number of reasons. Primary amongst these are:

- There is inherent uncertainty around climate change projections and impacts. Although confidence in climate change projections is increasing as the understanding of climate science and related feedback loops in the earth system develops, there is still a degree of uncertainty, particularly around the magnitude and timing of projected changes. In addition, while confidence in climate change projections increases between the mid to end century period, the interim period between the present to mid-century is more variable. This illustrates the challenge to policy and decision makers who need to plan for the medium to long term now, but with uncertain information. Addressing this challenge calls for flexible adaptive responses that allow for continued research and monitoring of trends; that develop adaptive capacity within all systems to enable appropriate responses; and that allow for reversibility in the case of unforeseen negative consequences of adaptation interventions.
- The indivisible linkages between the drivers of risk and the resultant vulnerabilities in highly interdependent and interlinked social, economic and ecological systems. Identifying cross-sectoral adaptation responses is therefore required, creating the need for innovative partnerships, not only across government sectors and spheres, but including various stakeholders from the private and NGO sectors.
- There is a broad range of conditions that contribute to vulnerability, some of which are location specific. In order to effectively address these vulnerabilities and develop adaptive capacity, locally specific responses are required.
- Climate change poses a unique challenge, one that the global community has not had to deal with before. There is no blue print for adapting to climate change, resulting in the need to both innovate and allow for a certain amount of trial and error. Adaptation interventions must, however, be carefully considered to avoid maladaptation – an action that whilst addressing one form of vulnerability creates or exacerbates others. This highlights the need to look at systems holistically, adding further weight to the need for cross-disciplinary, transversal approaches. It also highlights the need to prioritise ‘no regrets’ adaptation interventions that will serve as a positive intervention no matter the extent or timing of climate change. This complexity does not lend itself to simple, generic, once-off solutions that can be applied across the province, but rather favours a flexible, locally specific, adaptive, in-house, ongoing approach that prioritises sustainable development in focusing on current climate vulnerability.

8.3 Prioritised Work Areas

In order to give action to this approach, the following work areas have been prioritised:

- Institutionalisation and mainstreaming of climate change response into the governance structures
 - The Western Cape Government

Many strategies and plans already exist within various WCG departments which make mention of climate change, identify sector-specific climate vulnerability, and in some cases, have climate change adaptation plans. These strategies and plans will need to be reviewed and supplemented where necessary in order to integrate a consolidated overall WCG Climate Change Adaptation Response framework.
 - The City of Cape Town

The City of Cape Town is playing a leading role in the climate change space regarding institutional and policy development as well as project implementation. These achievements and the building of climate change response business cases can be very influential in driving change among other local authorities.
 - District and local municipalities in the Western Cape

In addition to the City of Cape Town, the Western Cape is governed at a local level by twenty four local municipalities and five district municipalities. There is very little capacity or budget to take on an additional portfolio such as climate change at the local level. The approach therefore is to mainstream and embed climate change into local and district level line functions and master planning, such as the Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and Disaster Management Plans (DMPs). In order to assist and support local and district municipalities in the identification and implementation of this approach, the Western Cape Government has set up a Climate Change Municipal Support Programme.
- Ongoing collaborative research is required in order to:
 - Collectively monitor changing conditions;
 - Develop innovative ways of responding to both new conditions and cases where previous methods of addressing climate change adaptation are not providing solutions;
 - Better understand the complexity inherent in the emergent conditions created as a result of climate change;
 - Develop innovative ways of financing climate change adaptation at the local level, including adaptation activities that support local disaster risk reduction.
- Monitoring and evaluation of adaptation interventions in order to establish efficacy and best practice, as well as track progress. This includes a framework that can accommodate monitoring and evaluation of all adaptation work taking place across the province.

8.4 Western Cape Climate Adaptation Database (WCCAD)

A database of existing and planned adaptation projects across the province has been developed as a start to effectively coordinating climate change adaptation efforts across the province.

The information will facilitate:

- The identification of key stakeholders with a view to developing partnerships;
- The identification of priorities and gaps;
- Spatially mapping the location of adaptation interventions across the province to identify hot spots and areas requiring support;
- The sharing of experiences and lessons learnt;
- Replication of effective interventions;
- Identification of synergies and partnership opportunities;
- Collating areas of work and developing programmatic areas so as to attract funding; and
- Efficient use of collective resources and effort.

9 CLIMATE CHANGE FOCUS AREAS

In order to implement the Strategy, the initial efforts will be on select focus areas as well as the overarching programmes. The focus areas ensure alignment with the National Climate Change Response Policy Flagship Programmes, but also ensure alignment with the work that will be undertaken as part of the Western Cape Green Economy Strategy Framework.

These focus areas have been selected based on the urgency of action required. In many cases, work in these focus areas is already being implemented by WCG departments, local authorities, the business sector, NGOs and other key stakeholder groups. The focus areas will include both the scaling up of existing climate change initiatives and the development of required new initiatives.

The focus areas will be reviewed every five years to assess the relevance of those selected for the last period and to address priorities for that period. If necessary, the focus areas may be adjusted to a sectoral approach in order to mainstream climate change into all programmes.

There are a number of overarching programmes that will feed into all the focus areas, including:

- Communication, awareness raising, capacity building and education: this will be the cornerstone of any work undertaken as part of the climate change implementation plan, as most of these projects require changes in behaviour, mindsets and activities in order to be successfully implemented;
- Financial models and mechanisms: this will include providing guidance on the financing of climate change related projects, as well as the identification of funding sources for climate change related projects.
- Job creation: Unemployment is a key issue for South Africa as well as the Western Cape. At the same time, climate change responses that improve resilience could positively impact on employment opportunities in the Western Cape. The WC climate change response should attempt to reduce the impact of job losses and promote job creation during the shift towards the green economy. The Expanded Public Works Programme (EPWP) has a strong role to play in identifying and promoting job opportunities as part of the response to climate change and the shift towards a green economy. These opportunities need to be identified in the short-term and implemented, where appropriate, across the province.

Certain initiatives already underway will cut across various focus areas. An example of this is a green economy project which involves the development of an investment case centered on the valuation of the Western Cape ecosystem goods and services, towards the development and realization of an investment portfolio.

The focus areas are discussed briefly below and the detail around the programmes under each focus area will be included in the implementation framework.

9.1 Energy Efficiency and Demand-Side Management

Energy efficiency and demand-side management are key components of the climate change mitigation programme. The Western Cape energy consumption and CO₂e emissions database allows for the identification and prioritisation of key sectors and areas and for reporting on energy efficiency implementation and progress. The 2009 baseline should be updated on a bi-annual basis in order to ensure that the information is up-to-date and aligned with the national energy and emissions data collection exercises. The recently completed energy profile of the province will guide the development of evidence-based targets related to energy efficiency and demand-side management.

Building energy efficiency, as well as other resource efficiencies, is highlighted as key interventions for both the private and public sectors. Opportunities and case studies around successful interventions need to be shared and the mechanisms to facilitate implementation, to be developed. A key component of this work is around communications, awareness raising and behaviour change.

The large scale rollout of solar water heaters - both high and low pressure systems - has been highlighted as a key intervention to support both energy efficiency (high pressure systems) as well as addressing energy poverty (low pressure systems). Financial models and mechanisms need to be developed in order to promote the mass roll out. The City of Cape Town is pioneering an innovative approach to the large scale rollout of high pressure systems.

Priority areas

- Fact-based energy efficiency targets for the Western Cape and the relevant sectors;
- Building efficiency programmes and awareness raising, including improved energy efficiency of WCG's own building stock;
- Solar water heater promotion and roll-out (both low and high pressure systems).

9.2 Renewable Energy

Renewable energy is a key area of focus for the Western Cape, and forms a fundamental component of the drive towards the Western Cape becoming the green economy hub for Africa.

The renewable energy sector in the Western Cape covers large scale wind and solar PV facilities as well as smaller scale, off-grid systems that are becoming more established.

The WCG has a role to play in supporting the development of the renewable energy industry through promoting the placement of renewable energy facilities in strategic areas of the Western Cape as well as through supporting renewable energy industries.

Waste-to-energy opportunities in the Western Cape are being further investigated in order to facilitate large scale rollout. This includes understanding the most appropriate technologies for waste-to-energy projects as well as developing decision support tools for municipalities to implement waste-to-energy programmes.

Priority areas

- Development of the Renewable Energy economy in the Western Cape, in terms of both the appropriate placement of renewable energy as well as manufacturing opportunities;
- Development of waste-to-energy opportunities for both the municipal and the private (commercial and industrial) waste systems;
- Development of opportunities around small-scale renewable energy embedded generation activities.

9.3 The Built Environment

9.3.1 Critical Infrastructure

The Western Cape Infrastructure Framework (2013) defines a new approach to co-ordinated and strategic infrastructure planning in the Western Cape. The framework will be used to align existing infrastructure planning processes and outlines the strategic decisions and trade-offs that need to be made to achieve the provincial 2040 vision in a complex and changing environment. It will also identify and guide the planning and execution of major infrastructure interventions, mobilise and direct new investment and facilitate partnerships and collaboration. Climate change responses and impacts, including the need to reduce GHG emissions and the impact that extreme events and ecosystem degradation will have on the Western Cape have been integrated into the framework.

Work is underway to identify critical infrastructure at risk of climate related hazards, and to develop risk reduction plans to secure these critical infrastructure hotspots. The WCG disaster risk management function is also working with a number of municipalities in the Western Cape to identify community-based risks and vulnerabilities and identify actions that need to be implemented to reduce these.

Priority areas

- The identification of critical infrastructure hotspots;
- The development of appropriate planning tools to integrate climate change into decision-making;
- Assessment of all Disaster Management Plans across the province;
- Mainstreaming climate change into municipal and provincial spatial planning processes.

9.3.2 Waste Minimization and Management

Waste decomposition is responsible for a proportion of the total GHG emissions for the Western Cape. At this stage, the proportion of emissions is based on estimated waste volumes and characterisations. Some municipalities have undertaken detailed waste characterisation exercises, with others still needing to undertake this. Waste is also a source of health risks, water contamination and creates blockages in the drainage network, which exacerbates climate risks. Therefore, waste minimization and management is a key adaptation measure.

Priority areas

- Development of waste characterisation profiles for municipalities in the Western Cape;
- Promotion of the waste economy and identification of opportunities to reduce waste going to landfill.

9.3.3 Human Settlements

Human settlements, in both the urban and rural context, face climate change challenges. Climate change may exacerbate the problems caused by poor urban management, e.g. increased storm intensity (expected with climate change) together with poor storm water management and urban-induced soil erosion could result in flash flooding. Cities are particularly vulnerable to climate change because they are slow to adapt to changes in the environment and they have entrenched dependencies on specific delivery mechanisms for critical services. South Africa's cities still reflect apartheid planning with the poorest communities tending to live far away from services and employment. Informal settlements are particularly vulnerable to floods and fires, exacerbated by their location in flood-prone areas and on sand dunes, inferior building materials, close proximity to one another and inadequate road access for emergency vehicles.

Priority Areas:

- Mainstreaming climate change into human settlement developments;
- Implementation of energy efficiency interventions in low income houses and communities;
- Improving the resilience and adaptive capacity of informal settlements.

9.4 Sustainable Transport

With transport being one of the biggest consumers of energy in the Western Cape and using significant portions of land, the sector has a key role to play in responding to climate change. This response will be realised through promoting sustainable transport options that include promoting the move to public transport, the shift from road to rail freight and the improvement of efficiencies in private vehicles. Large scale changes to the transport sector will take time primarily due to the large costs required for implementation.

There are, however, opportunities to raise awareness around sustainable transport options to support people making informed choices about transport modes. Programmes, such as TravelSMART, which encourage sustainable transport behaviour by the employees of large companies in the Cape Town CBD, will be supported for further roll outs.

Spatial planning plays a key role in transport planning and can strongly support the implementation of sustainable transport interventions, e.g. encouraging developments on existing public transport corridors, car-free developments that put workers close to their place of work and identifying integrated planning opportunities for all necessary goods and services.

Good opportunities also exist for the WCG, municipalities and other government stakeholders to play a role in promoting government vehicle efficiency, through putting in place efficiency standards for the purchase of new vehicles, promoting eco-driving by all the users of the government fleet and putting in place a "smart" management and maintenance system for vehicles. These programmes can also be implemented by the private sector.

Priority areas

- Promoting of public and non-motorised transport, including the development of appropriate infrastructure;
- Investigating opportunities in terms of alternative transport fuels, including biofuels;
- Awareness raising and behaviour change programmes around transport modes;
- Government vehicle fleet efficiency programmes.

9.5 Water Security and Efficiency

With the Western Cape being a water stressed province in a water-stressed country, and with climate change projections pointing to a drying trend in the western half of the country, water security is a primary concern for the province. This is borne out by the development of the Western Cape Sustainable Water Management Plan (2012) which allows for growth and development in the Western Cape without compromising ecological integrity (see section 6.5). The optimal ecological functioning of our catchments is key to securing water supply across the province, and as such a number of programmes are focusing on addressing this. Key amongst these are:

- The Berg River Improvement Programme (BRIP), which aims to enhance the ecological functioning of the Berg River, one of the two major water supply sources in the Western Cape, through multi-partner and community interventions that focus on employment creation;
- Risk and vulnerability mapping of the rivers with a view to identifying options for ecosystem-based risk reduction.

Water security is also being highlighted in the Climate Change Adaptation Planning taking place under the WCG's Climate Change Municipal Support Programme (MSP). This aims to assist municipalities in becoming more water efficient, encouraging technologies such as water re-use plants, and in supporting programmes targeting reduced local water demand. This programme is further supported by the WCG's Green Economy Strategy Framework (2013), which identifies smart living and working as one of the drivers of a green economy, under which water efficiency is highlighted as a "litmus test for green growth". A number of both technological and investment opportunities are identified under this theme, which will provide a further framework for driving and supporting the much-needed changes in this vital sector.

It is increasingly recognised that water security cannot be examined in isolation due to the currently indivisible link between water security and energy security. Both are in turn closely linked to the food system, which is in turn reliant on the physical environment (including water) and infrastructure (including energy and transportation). In response to these tightly interlinked and interdependent systems, various stakeholders in the WC are developing an improved understanding of the resource nexus. This involves the quantification and mapping of these resources within defined geographic areas, with a view to aiding integrated decision making.

Priority areas

- Invasive alien vegetation clearing;
- Prioritisation, valuation, mapping, protection, and restoration of ecological infrastructure in catchments;
- Effective utilisation of irrigation water;
- Resource nexus¹⁸ decision support;
- Develop ecosystem goods and services (EGS) investment opportunities.

9.6 Biodiversity and Ecosystem Goods and Services

The Cape Floristic Region (CFR) is classified as a “global biodiversity hotspot” by Conservation International and some of the protected areas in the CFR have been given World Heritage status by UNESCO and the International Union for Conservation of Nature (IUCN). The CFR is not only the smallest of the world’s floral kingdoms but also has the highest plant diversity, with a high proportion of endemic and threatened Red Data List species (68% of South Africa’s threatened species are located in the Western Cape). The Western Cape’s biological diversity and natural resources are under threat from climate change, pollution, overexploitation of natural resources, invasion by alien species and escalating development. It is, therefore, imperative to address these threats and their impacts.

According to the IUCN World Heritage Sites Case Studies (2007) climate change might be the most significant threat facing biodiversity in the Cape Floristic Region over the next 50 to 100 years. The most threatening aspects of climate change to the conservation of the biodiversity of this area are:

- Shrinking of optimal bioclimatic habitats with warming and potential drying;
- Changes in ecosystem structure and composition in response to modification of environmental conditions;

¹⁸ The resource nexus relates to the interconnectedness between resources such as food, water and energy, and related supporting resources such as land/soil and biodiversity and the impact of the use of one resource on the sustainability of other resources. The extent of the interconnectedness between the different resources means that none of the areas can be addressed in silo fashion.

- Increase of fire frequency;
- Impact on freshwater ecosystems (floods and droughts);
- Sea level rise impacting on marine organisms and coastal ecosystems infrastructure;
- Soil biodiversity especially related to soil fertility and the production landscape.

In order to improve the health of the province's ecosystems and thus strengthen ecosystem resilience to climate change, programmes are required to halt the loss of critical biodiversity areas and to restore areas already degraded by invasive species and poor land management practices. Programmes such as the City of Cape Town's Biodiversity Network (BioNet) and planning tools that map out the Province's Critical Biodiversity Areas, have identified the minimum set of land parcels required to conserve a representative sample of Cape Town and the Western Cape's unique biodiversity in the face of climate change, as well as urban growth and expansion. Extensive work is underway by various stakeholders to mainstream conservation planning into decision making.

Priority areas:

- Prioritisation, valuation, mapping, protection, and restoration of ecological infrastructure;
- Landscape initiatives / biodiversity corridors and identification of requirements for climate change adaptation corridors;
- Biodiversity stewardship;
- Mainstreaming of conservation planning into decision making.

9.7 Coastal and Estuary Management

Being a coastal province, sea level rise and storm surges pose a significant threat to the Western Cape. There are areas that are already being inundated by storm surges, and although this is largely due to historically inappropriate development in high risk areas, this risk is only set to increase with the progression of climate change. In line with the requirements of the National Environmental Management: Integrated Coastal Management Act, 2008, coastal setback lines are currently being delineated across the province. This will assist in deterring future developments in high risk coastal areas.

Ecosystem-based adaptation is key to protecting the coastal zone from storm surges, with dune fields providing the most effective barriers to coastal inundation. The maintenance of this valuable ecological infrastructure will be prioritised, however in some cases these natural buffers are no longer in place, and alternative management strategies will need to be explored. Efforts will be made to assist municipalities in the mapping and prioritisation of these natural buffers.

The fisheries sector is one of the key economic sectors in the Western Cape, as well as having significant socio-economic implications for smaller coastal communities such as the West Coast. There is great uncertainty in terms of the impact of climate change on the fisheries sector, but projections include shifts in species distribution, abundance and seasonal availability as well as

coastal infrastructure damage. These, together with the likely social and economic costs of climate change on the fisheries sector need to be understood and assessed in greater detail.

Priority areas:

- Establishment of coastal hazard overlay zones and setback lines;
- Research best practice regarding responding to repeated coastal inundation in high risk areas;
- Protecting and rehabilitating existing dune fields as coastal buffers / ecological infrastructure;
- Monitor possible linkages between climate change and fisheries industry;
- Ensure Estuary Management Plans take cognisance of climate change.

9.8 Food Security

The ability of the agricultural sector to ensure food security is closely affected by climate variability and change, which in turn affects water availability. These linkages highlight the need for partnerships and an integrated approach to resource security in the face of climate change.

Programmes such as FruitLook¹⁹, which aims to improve farmer's water use efficiency without compromising production; and the Landcare programme which strives to rebuild, maintain and improve the natural resources in the Western Cape by promoting efficient conservation practices; are examples of the leading role that is already being played by the sector in climate change adaptation. In addition there is growing recognition of the need for 'climate smart agriculture' which focusses on climate adaptation through building farmer's climate resilience as well as improving livelihoods through poverty reduction.

These and similar initiatives, both within the WCG and the private sector, need to be supported and expanded in order to continue to develop adaptive capacity within this climate sensitive sector.

The WC Green Economy Strategy Framework (2013) highlights smart agri-production as one of five drivers of the green economy in the province, and in so doing identifies the following amongst the priority areas:

- Sustainable labour intensive farming;
- Farming practices that are in harmony with nature;
- Water technologies that reduce consumption and increase efficiency.

In addition to focusing on the ability to produce sufficient food, food security also concentrates on the issues of access to food and the nutritional content of food. These, and related issues

¹⁹ Western Cape Department of Agriculture

around social vulnerability are included in the climate change adaptation planning being done at the local level under the WCG's municipal support programme.

Priority areas:

- Farming practices that are in harmony with nature, i.e. 'conservation farming';
- Climate smart agriculture;
- Agricultural water technologies that reduce consumption and increase efficiency;
- Research on climate resilient and alternative crops and livestock applicable to the Western Cape;
- Addressing climate vulnerability through the Municipal Support Programme;
- Assessing food security in the context of the resource nexus.

9.9 Healthy Communities

The WC population is characterised by a relatively high rate of unemployment, burgeoning informal settlements and high incidence of HIV/Aids and Tuberculosis making many vulnerable to climate related hazards such as extreme events characterised by floods and high winds, heat waves and cold snaps. The health related impacts associated with these kinds of events include heat stress, an increase in incidence of communicable diseases, and potential expansion of disease vectors. Further research needs to be undertaken to improve the understanding of the linkage between actual climate changes and the potential health impacts. Monitoring is key to picking up any trends and changes. A WC Climate Change and Health Committee including both internal and external stakeholders has been established by the Department of Health that focuses on both climate change mitigation and adaptation issues related to health.

Priority areas:

- Monitoring health trends in relation to climate trends;
- Research linkages between human health and climate change in the WC context. These include:
 - Air quality
 - Water quality
 - Food security
 - Heat stress
 - Disease vectors

10 IMPLEMENTATION FRAMEWORK

An implementation framework will be developed to ensure the effective execution of the Strategy. This section briefly discusses the components of the implementation framework.

10.1 Institutional Framework

In order to achieve the objectives of the Western Cape Climate Change Response Strategy 2014 across the province, work will need to take place at multiple spatial and temporal scales. If not already set up through the Western Cape working groups, structures will need to be put in place and roles and responsibilities agreed to in order to facilitate the response of all spheres of government as well as those of multiple stakeholders. Various structures and interventions are required in order to achieve the goals of climate change mitigation and adaptation. These include:

- An institutional framework to facilitate (plan, prioritise, implement, monitor and evaluate) the response of all spheres of government;
- The identification of existing responses to climate change mitigation and adaptation by different stakeholders;
- Partnering with NGOs, private sector and others across the province, nationally, regionally and globally;
- Partnering with academia and specialists in the field of climate change in order to stay informed of developments in this novel and rapidly developing field.

10.2 Partnerships and an Integrated Approach

There are many stakeholders engaged in mitigation risk reduction and resilience building activities across the province. Mechanisms will be established and made functional to engage and partner with key stakeholders in order to maximise effective climate change mitigation and adaptation programmes.

These partnerships will be developed in such a way that government plays a supporting role to some programmes and projects and a leading and oversight role in others. The integrated approach to addressing climate change needs to be highlighted throughout these partnerships and it is important that the activities developed as part of the Strategy are not limited to those actions that are managed by the public sector.

Partnerships with the following stakeholder groups are envisaged:

- Local, provincial (other provinces in South Africa) and national government stakeholders;
- International organisations, including funders, research bodies and project implementers;
- Tertiary education institutions – research and monitoring;
- Parastatals;
- Private sector project implementers and developers;
- NGOs and community based organisations;

- The retail sector;
- Business associations and organisations;
- Organised agriculture and community organisations ;
- Insurance and finance industries;
- Faith-based groups; and
- Other stakeholder groups.

The nature of the partnerships is not discussed in this section as these will be specific to particular programmes and actions.

10.3 Programmatic Approach

Although the Strategy is divided up into a mitigation and an adaptation approach, and the focus areas are sector based, moves have been made towards a programmatic approach to climate change response. A programmatic approach integrates mitigation and adaptation responses in a particular region or for a particular theme.

This approach marks a significant shift in the way that climate change has been addressed in the Western Cape and different approaches will be tested and modified in order to identify the best way in which to create an integrated climate change response.

10.4 Financing and Resourcing

Resource mobilisation needs to be informed by the mainstreaming of climate change into the planning and decision-making of government, private sector, and civil society. This can be achieved by:

- Creating an enabling environment whereby government, private sector and civil society collectively respond to the economic and social changes necessary for climate-resilient development and job creation, providing for the economic and social upliftment of communities, while minimising negative impacts in the future;
- Promoting the green economy as an effective means of contributing towards the climate change response, and securing resources to support climate change and green economy interventions;
- Consolidating and extending existing initiatives towards a climate resilient economy.

The emerging climate change response finance options include grants for research and development co-operation; commercial finance through debt and equity, concessionary finance, risk insurance, specialised environmental funds, and new capital market innovations, such as green and climate bonds. These options may be extended by integrating financing for biodiversity and other environmental resources, such as payment for ecosystem goods and services. By necessity, the climate change finance framework needs to comprise a suite of measures to create and maintain a long-term funding framework for mitigation and adaptation actions and to trigger swift and urgent action towards climate resilient development. Importantly,

while accessing funds is a crucial aspect of implementing the WC Climate Change Response Strategy, removing the barriers to and creating enablers for using these funds is as important and will need to be given focus.

11 MONITORING AND EVALUATION

11.1 Project Prioritisation

The implementation framework will provide a detailed list and prioritisation of activities and programmes that need to be implemented for each of the focus areas. Trade-offs between activities and programmes will be required, which will be made explicit through the inclusion of a decision-making matrix in the implementation framework. This matrix will address the benefits, costs and associated impacts of all considered projects and will take into consideration contributions to the strategic outcomes and WC targets, capacity to implement, links to available finance, supporting the growth of existing industry and maximising the benefit: cost ratio.

The implementation framework will also take a phased approach.

11.2 Monitoring and Evaluation System

The overarching objectives of the Monitoring and Evaluation System (M&E) will be to track the transition to a low carbon and climate resilient Western Cape. This will include:

- Providing a clear picture of the various response measures included in climate change mitigation and adaptation;
- Providing an assessment of the effectiveness of these response measures, where possible;
- Applying a consistent approach to these assessments to allow for greater comparability;
- Increasing co-ordination of climate change response measures and M&E;
- Demonstrating impact of response measures to funders;
- Increasing transparency on finance flows relating to climate responses; and
- Increasing awareness of observed and projected climate impacts.

The challenges inherent in a climate change monitoring and evaluation system include:

- Planning for uncertainty
There is a range of uncertainties which make it difficult to determine whether a proposed adaptation action will be effective in the longer term. These include future emissions scenarios, technological advancements, and socio-economic conditions
- Attributing a certain climate change response activity to a prescribed outcome
Making a direct causal link between a climate change response measure and attributable outcomes can be difficult for both adaptation and mitigation. In the case of adaptation,

this may be due to long timescales and uncertainties, but also because a range of externalities shape the resilience or vulnerability of complex interlinked socio-economic, infrastructure, and environmental systems.

- **Establishing baselines**
Adaptation efforts seek to keep development on track in the face of changing environmental conditions, and this evolving baseline of climate hazards and risks presents a challenge for evaluations.
Difficulty also lies in developing comprehensive and accurate baselines for energy consumption and GHG emissions, as data collection and reporting takes place through a number of stakeholders and at different geographical scales.
- **Measuring success**
Adaptation poses a particular challenge in this regard, as it often refers to a process rather than an outcome, which can further complicate the selection of indicators. In some instances qualitative evidence base is required to track and measure success through case studies rather than indicator-based approach. Furthermore, the definition of 'success' has not been agreed on.
- **Monitoring and evaluating all relevant stakeholder climate change responses in one system**
Effective climate change responses require an integrated multi-sectoral, multi-scalar, approach to be effective and have the envisaged outcome of a low carbon climate resilient Western Cape. Capturing all responses in once system will require
- **Measuring the impact of response measure over long timescales**
Climate change will occur over long timescales, and we may not be able to assess whether our adaptation interventions have been effective for decades to come.
- **The counterfactual**
It is difficult to know what would have happened in the absence of response measures

It is important that the monitoring and evaluation system be developed in such a way to allow for both quantitative and qualitative reporting on project implementation. The monitoring and evaluation system will be aligned with the national M&E system and feed into it.

12 CONCLUSION

The Western Cape Climate Change Response Strategy 2014 will be enabled and implemented through an integrated approach, cementing current and fostering new partnerships in responding to climate change and utilising the WCG transversal Provincial Strategic Objectives (PSO) structures. The focus areas identified will be used to develop and populate the accompanying Implementation and Monitoring and Evaluation Frameworks.

An annual Monitoring and Evaluation Report on climate change response interventions in the Western Cape and on the achievement of relevant WCG Provincial Strategic Objectives and

climate change targets. The Strategy document will be reviewed and updated every five years in order to ensure alignment with international and national focus areas, commitments, priorities and targets.

Climate change is systemically and cumulatively inter-connected with the broader development challenges the world faces today. While the complexity of understanding and therefore addressing climate change is significant, climate action needs to be prioritised and significantly up-scaled as our communities are increasingly vulnerable to the adverse effects of climate change. We cannot afford to wait for data, information and systems to be perfect before taking action to implement programmes and pioneering local climate solutions. Solutions need to be executed based on current and emerging good practice as well as through effective utilisation of our ecosystem goods and services and associated green infrastructure options in order to significantly reduce the need for more costly, drastic, reactionary and emergency interventions at later stages.

While it is acknowledged that climate change will post significant challenges to government and civil society into the future, the Western Cape Climate Response Strategy 2014 creates an enabling and pro-active framework. At the same time, there are significant new and emerging opportunities, related to developing a low carbon, climate resilient Western Cape Province, which need to be realised.

NOTES

CONTACT :

Lize Jennings-Boom
Western Cape Department of Environmental Affairs and
Development Planning
Leeusig Building, 01 Dorp Street, Cape Town, Private Bag X9086, Cape Town, 8000
Telephone: 021 483 0769
Website: www.westerncape.gov.za/eadp
Email : Lize.Jennings@westerncape.gov.za



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