



Western Cape
Government

Department of Environmental Affairs
and Development Planning

WESTERN CAPE CLIMATE CHANGE RESPONSE STRATEGY

VISION 2050: A vision for a resilient Western Cape

March 2022

ABOUT THIS STRATEGY

The Western Cape Climate Change Response Strategy: Vision 2050 responds to the global climate change emergency amidst the dramatic global events of 2020-21. It incorporates the latest science and the overwhelming evidence supporting the need for a green and low-carbon economic recovery. Whilst recognising the progress made since the release of its predecessor in 2014, the updated strategy aims to address an urgent 2030 deadline, ultimately planning a trajectory for strategic outcomes in 2050. This will culminate in an implementation plan that will focus on incremental five-year horizons - expressing the ambition and a call to action.

The Climate Change Directorate within the Department of Environmental Affairs and Development Planning (DEA&DP) has undertaken the development, review and coordination of the revised Strategy. The Strategy is envisaged as a transversal strategy providing policy direction in response to climate-related risks and potential opportunities, through either creating or leveraging systemic innovative response programmes that tackle the region's vulnerability to droughts, heat and floods and take advantage of opportunities that will enable climate resilient development which fosters economic growth that is low-carbon and further creates an advanced Green Economy. Even though the Strategy is drafted by the Western Cape Government, it is a guiding document for all sector stakeholders in the province (both public and private sector) who can play a role in responding to climate change.

As such, this March 2022 version incorporates input received from key stakeholders and the public at large. Our hope is this collaborative document represents the sentiments of the people of the Western Cape, and that it will instil a greater sense of accountability and buy-in, leading to rapid implementation through shifts in decision making by government departments and its private sector partners. Some of the actions and targets identified in the document will be specific to Western Cape Government departments, but others will require external implementation support.

We call on everyone to be part of the climate solution.

Authors

Sarah Birch, Jody Brown, Faith Chihumbiri, Lize Jennings-Boom, & Gerard van Weele
(Western Cape Government, DEA&DP, Climate Change Directorate)

Internal Review

Goosain Isaacs - Director: Climate Change

Karen Shippey - Chief Director: Environmental Sustainability

Acknowledgements

The Western Cape Government Climate Change Directorate would like to acknowledge the ongoing support from and collaboration with the Provincial Climate Change Response Work Group and Forum for support in the development of this Strategy. We are grateful to the many colleagues from within the Western Cape Government, local governments, private sector and other partner organisations for their contributions.

Contents

EXECUTIVE SUMMARY	i
OUR VISION FOR THE WESTERN CAPE'S CLIMATE CHANGE RESPONSE	1
A call to action.....	1
Vision 2050	5
OUR STRATEGY	6
Overview.....	6
OBJECTIVE 1: Responding to the climate emergency.....	7
OBJECTIVE 2: Transitioning in an equitable and inclusive manner to net zero emissions by 2050	10
A transition to a net zero emission future by 2050.....	10
The need for a clean, low-carbon and modern energy system for all.....	12
Carbon costs as a key component of our economic planning	12
OBJECTIVE 3: Reducing climate risks and increasing resilience.....	16
OBJECTIVE 4. Enabling a just transition through public sector, private sector and civil society	
collaboration.....	20
Vulnerable people are most affected by climate change	20
The important role of government	22
INSTITUTIONAL ARRANGEMENTS	26
MONITORING, REPORTING AND EVALUATION	29
LET'S GET STARTED	31
ANNEXURES	34
Abbreviations and Acronyms.....	34
Glossary of Terms.....	35
What science says about climate change in the Western Cape	40

LIST OF FIGURES

Figure 1. Coloured bars showing the progressively rising temperatures in South Africa since 1901 (https://showyourstripes.info/)	1
Figure 2: Climate change impacts and risks for selected systems as temperatures rise – white indicates no impacts, and purple shows very high risk of severe and/or irreversible impacts. The grey band denotes global temperatures for 2006-2015. (source: www.ipcc.ch/sr15)	3
Figure 3. Structure of the WCCCRS Vision 2050.....	6
Figure 4. GHG emissions mitigation required for a 1.5°C global trajectory (https://folk.universitetetioslo.no/roberan/t/global_mitigation_curves.shtml)	7
Figure 5: GHG emissions by sector for the Western Cape (excl. IPPU)	10
Figure 6. South Africa's fair share GHG mitigation compared to current country ambition	15
Figure 7: Institutional arrangements for climate change governance in the Western Cape ...	26

LIST OF TABLES

Table 1: Observed and Projected Climate Change Impacts.....	44
---	----

EXECUTIVE SUMMARY

CALL TO ACTION

Globally, climate change is being recognised as an Emergency, with immediate systems change required to achieve significant emissions reductions by 2030 and maintain a habitable planet for all, whilst adjusting to the spreading impacts of climate change. The Western Cape has already started to experience the impacts of climate change and these are undermining our social and economic development gains. An accelerated response is required to address the threats and opportunities posed by climate change across the spectrum of the sectors of the region and the Western Cape Government. This Strategy guides the bold shifts required by 2030 to ensure we both meet our emissions reductions targets and create social, ecological and economic resilience in the face of climate destabilisation through the course of the next three decades up to 2050.

The **Western Cape Climate Change Response Strategy: Vision 2050** (WCCCRS) describes a climate future that the Western Cape province will strive towards. It is centred on a Vision and four Guiding Objectives defining the direction of climate change response action for the region, with corresponding targets and actions. The figure below illustrates this structure of the WCCCRS.



Structure of the Western Cape Climate Change Response Strategy: Vision, Guiding Objectives, Climate Action Pathways and Implementation Plan

A set of necessary actions under each guiding objective is discussed and presented in this Strategy. These actions will, however, further evolve and be developed through stakeholder engagements, sector planning processes, and associated projects such as a 2050 Emissions Pathway exercise. More detailed response actions, highlighting timelines, quantified targets and specific responsibilities for implementation will be captured in a full implementation plan which will be published in the wake of the adoption of this strategy.

VISION

Our Vision is to be a net zero emissions and climate resilient province by 2050, built on an equitable and inclusive economy and society that thrives despite the shocks and stresses posed by climate change

GUIDING OBJECTIVES

The Western Cape province needs to accelerate the implementation of response actions that will mitigate climate change and increase our general resilience to the rapidly changing conditions. This response must align with provincial priorities of providing safe and cohesive communities, promote job and economic growth, mobility and spatial transformation as well as value culture and inspire innovation amongst its citizens.

Four guiding objectives, aligned to the aspiration expressed in the vision, give structure to our response strategy:



Responding to the climate emergency



Transitioning in an equitable and inclusive manner to net zero emissions by 2050



Reducing climate risks and increasing resilience



Enabling a Just Transition through public sector, private sector and civil society collaboration

CLIMATE ACTION PATHWAY

A Climate Action Pathway is outlined below, which identifies actions necessary for achieving 'Vision 2050'. The milestones will help measure progress towards reaching a climate resilient state.

	2022-2025	2025-2030	2030-2040	2040-2050
Responding to the climate emergency	<ul style="list-style-type: none"> Early warning systems to provide long-term (decadal) climate forecasts and improved extreme weather assessments Integration of climate change considerations in spatial development and planning Implement coastal risk management tools Climate Change communication and awareness plan Roadmap and mechanism for the formulation of sector-specific climate change response strategies Develop a Short-Lived Climate Forcers Strategy 	<ul style="list-style-type: none"> International climate finance access Water security plan in place Fossil Fuel disinvestment by public funds Capacitate people living in informal settlement 		
Transitioning in an equitable and inclusive manner to net zero emissions by 2050	<ul style="list-style-type: none"> Complete the Western Cape's greenhouse gas emissions inventory Detail a 2050 Greenhouse Gas Emissions Mitigation Pathway Climate change sector strategy for Economic Development Conservation agriculture to increase soil carbon sequestration Coordination of municipal access to renewable energy Improve energy (electricity) access 	<ul style="list-style-type: none"> Climate change sector strategy for Transport Improved energy resilience (500MW of grid independent renewable energy installed in the Western Cape) Revitalised rail system as part of investment in public transport Coordination of widespread electric vehicle adoption and charging network Increased uptake of non-motorised transport Land, water and energy efficient new buildings Zero organic waste to landfill by 2027 	<ul style="list-style-type: none"> Phase out internal combustion public transport and public fleet vehicles Localisation of manufacturing linked to low-carbon activities (e.g. electric vehicle components, batteries, solar 	Net Zero emissions

	Government motor fleets electric vehicle transition commences	Energy transition plan	photovoltaic systems)	
Reducing climate risks and increasing resilience	<ul style="list-style-type: none"> Updated SmartAgri Plan Continued efforts at removing alien vegetation infestations Climate change considerations for Disaster Risk Assessments Extreme heat preparation and response plan Completion of an Adaptation Pathway exercise 	<ul style="list-style-type: none"> Implement Ecosystem-based and Community-based Adaptation Enhancing natural coastal defences Improved protection of critical conservation and agricultural land Improved river health Improve urban open space Reduce wildfire risks through ecosystem management Improved Disaster Risk Management Improve food security prospects 	Achieve universal access to basic services	
Enabling a Just Transition through public sector, private sector and civil society collaboration	<ul style="list-style-type: none"> Initiate a Climate Assembly Set up climate governance structures Sustainable procurement programme and public employment programmes Climate Change data collection systems Local Government Support Ensure government financial systems prioritise climate resilience 	<ul style="list-style-type: none"> Private sector initiatives supported and facilitated Improved indices of human development and welfare Climate change sector strategy for Health National and international networking Monitoring and Evaluation systems Coordination of government planning Western Cape Climate Change Response Strategy diagnostic and adjustment Education, training and skills development plan(s) 		



IMMEDIATE ACTIONS

Immediate implementation of the WCCCRS will require that existing initiatives within the Western Cape Government and other institutional structures in the province are aligned to the vision, objectives and targets, and that foundations are laid for the filling of implementation gaps. It should be noted that climate action (esp. mitigation) need not result in new systems or require additional budget; it can be driven by current issues and mainstreamed through existing governance systems and innovative planning. We need everyone to contribute to the overall vision, through taking stock of where they are, and responding with what they have.

It is important to recognise that the Western Cape has already instituted projects or programmes that respond to, or align with, the objectives of this climate change strategy. To avoid losing any momentum whilst more detailed sector responses are defined, the programmes identified below should be enhanced with the necessary vigour:

1. Increase the share of renewable energy and decentralised energy systems in the overall energy mix, and improving our energy security, through the **Western Cape Municipal Energy Resilience Initiative**
2. Improve the province's water security through transversal collaboration on the **Sustainable Water Management Plan**
3. Adapt the agricultural sector to the changing climate and global situation, in accordance with the **SmartAgri Plan**
4. Kick-start the transition to electric mobility and subsequent decarbonisation of transport through a **government-led Electric Vehicle fleet transition**
5. Complete the Western Cape's greenhouse gas emissions inventory and detailing a **2050 Greenhouse Gas Emissions Mitigation Pathway**
6. Implementation of the provincial **Air Quality Management Plan** and **Integrated Waste Management Plan** in respect of GHG emissions reduction
7. Identify climate change hazards and vulnerabilities as part of **Risk Assessments in Disaster Management Plan(s)**
8. Advancing the ecological resilience outcomes of the **Provincial Biodiversity Strategy and Action Plan**, through implementation of the **Ecological Infrastructure Investment Framework, Biodiversity Spatial Plan and Protected Area Expansion Strategy** to secure investment into natural capital and the restoration of our land and oceans
9. Utilize the **Sustainable Public Procurement Programme and public employment programmes** to create sustainable jobs and foster divestment from fossil fuels, whilst ensuring women and youth's economic empowerment and livelihood diversification
10. Ensuring the integration of **climate change considerations in all development and spatial planning processes** including the implementation of **coastal and estuary management instruments**
11. Continued improvement in the resource efficiency of, and renewable energy uptake in the Provincial building portfolio, for example through the **Global Green and Healthy Hospitals** programme and **Building Modernisation Programme**

NOW IS THE TIME TO BE AMBITIOUS

An accelerated response to the climate emergency is required. Whilst climate change is being mainstreamed across sectors with varying degrees of success, the current implementation of climate change response remains limited. In some respects, we are lagging behind global peers in terms of our ability to keep pace with changes. Importantly, the change within government requires fast-tracking. It is also now clear that it is primarily about human wellbeing and survival. Investing in climate adaptation is inherently pro-poor as it seeks to minimise the impacts on the most vulnerable in our society.

The Western Cape needs a bold and ambitious, yet realistic Climate Change Strategy, that takes us toward net zero carbon emissions by 2050, with transformative risk reduction and adaptation actions; otherwise, all other development decisions and pathways currently being planned and implemented will be undermined.

We need science driven - policy led political and private sector leadership to take bold, societal changing, decisive action to ensure nobody is left behind. In this way the Western Cape will realise its vision as the most resilient and low-carbon province in Africa.

OUR VISION FOR THE WESTERN CAPE'S CLIMATE CHANGE RESPONSE

A CALL TO ACTION

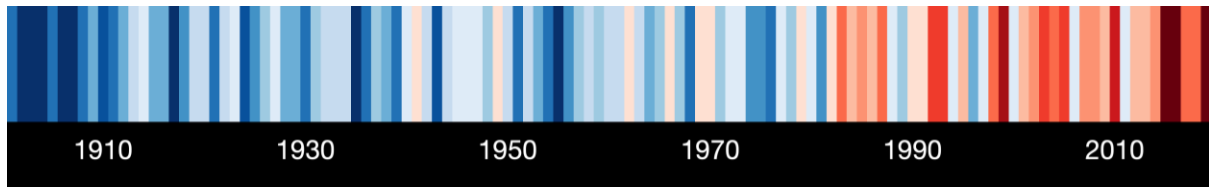


Figure 1. Coloured bars showing the progressively rising temperatures in South Africa since 1901 (<https://showyourstripes.info/>)

The Western Cape is already experiencing the impacts of climate change, exacerbating social and economic challenges, and undermining efforts to improve people's wellbeing.

Projections for the Western Cape show that under a 'middle-of-the-road' greenhouse gas emissions scenario (SSP2-4.5¹), where good global mitigation of greenhouse gas (GHG) emissions (also referred to as 'carbon' emissions) takes place, we can expect a 1.5°C increase by 2100, on top of the 1.5°C increase we've seen since 1850 (Figure 1). Differential impacts will, however, be felt in different regions. For example, in the interior average temperatures may rise by up to 6°C by the year 2100, which could accelerate migration to coastal areas that are subject to increased risk from rising sea levels (at least 60 cm) and more intense storms². Infrastructure along the coast will come under increasing threat as sea levels continue to rise.

The more extreme climate patterns will make day-to-day activities increasingly difficult, especially those taking place outdoors or dependent on a secure supply of water. Certain agricultural activities will become increasingly marginal or inviable, whilst the temperatures and other associated climate change impacts will affect our attractiveness as a tourist destination. Damages from increasingly frequent wildfires will escalate, and our water resources will remain under severe pressure. The costs of carbon emissions, in particular, will impact our global competitiveness if we are unprepared. For example, an additional pressure on the tourism industry is the carbon intense nature of travel to South Africa, which may lead to a decrease in tourism numbers.

Furthermore, climate change increases health risks which could manifest in premature deaths because of malnutrition, exposure to heat stress and air pollution. It also results in increased incidences of mental health disorders. Indications are that changes in

¹ The designation 'SSP' refers to 'Shared Socioeconomic Pathway', the climate change scenarios used for future projections of the earth's climate. Refer to the Glossary of Terms for more detail.

² IPCC, 2018. Special Report on Global Warming of 1.5 °C (www.ipcc.ch/sr15/)

temperatures and increasing encroachment into natural ecosystems by humans could release future pandemics³.

With inequality being a persistent issue in the development agenda, the effects of climate change will cause previously disadvantaged or overlooked groups, particularly marginalised women, people living with disabilities, youth and children, to suffer disproportionately, resulting in greater subsequent inequality. The literature on the impacts of climate change on women in particular is vast and provides a narrative that gender gaps and development gains of women in the past decades will continue to be undermined if climate change responses are not fully cognisant of this in their design⁴.

Time is running out. The 2020's have been dubbed internationally 'the Climate Decade' as this is the last decade with any scientifically plausible opportunity to accelerate mitigation programmes that can bring global GHG emissions, the 'carbon footprint', to zero by 2050 and limit the global mean temperature rise to 1.5°C above pre-industrial levels by 2030 as per the Paris Agreement⁵. This was reiterated at the 26th Conference of the Parties (COP26) of the United Nations Framework Convention of Climate Change (UNFCCC) in Glasgow in 2022 with an unequivocal call to accelerate "...efforts towards the phasedown of unabated coal power and phase-out of inefficient fossil fuel subsidies..."⁶. It is a 'now or never' situation - although significant impacts and risks are already expected at 1.5°C, further escalation of the risks can still be avoided (refer to the text box explaining the significance of 1.5°C).

Because of past emissions, we will need to adapt to the changes already locked into the global climate system, as well as any additional changes that result from further GHG emissions. Adaptation in the Western Cape, in particular talks to water security, food security, coastal impacts, impacts on biodiversity and ecosystem services, and on communities, especially the most vulnerable, particularly women and children, and those living in informality.

BOX 1. Understanding the significance of 1.5°C

Why focus on 1.5°C?

It is important to realise that "a 1.5°C increase in temperature" refers to an increase of the Earth's average temperature and not of an individual location. In fact, there are many regions across the world where warming has already surpassed 1.5°C above pre-industrial levels. The Earth heats up differentially, generally with the strongest warming in the Arctic during its cool

³ See, for example, <https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-climate-change/> and <https://www.sciencedirect.com/science/article/abs/pii/S0398762018312136>

⁴ Gender and environment statistics : unlocking information for action and measuring the SDGs (UNEP) <https://www.unep.org/resources/report/gender-and-environment-statistics-unlocking-information-action-and-measuring-sdgs>

⁵ The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UNFCCC COP 21 in Paris on 12 December 2015 and entered into force on 4 November 2016. Its goal is to limit global warming to well below 2, preferably to 1.5°Celsius, compared to pre-industrial levels. South Africa ratified the Agreement in 2016. See <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

⁶ UNFCCC, 2021. Report of the Conference of the Parties on its twenty-sixth session, held in Glasgow from 31 October to 13 November 2021: Part two: Action taken by the Conference of the Parties at its twenty-sixth session. https://unfccc.int/sites/default/files/resource/cp2021_01_adv_..pdf

season and in the Tropics during its warm season. Warming also tends to be higher over land in the interior of continents, compared to oceans and coastal areas.

Climate change has altered terrestrial, freshwater and ocean ecosystems across the globe, and further increases in global average temperatures will lead to more severe climate-related impacts such as temperature extremes, drought, declining human health, and so much more. Although limiting global temperature increase to 1.5°C does not mean that these impacts will not happen; it will reduce the magnitude of the impact, making it easier for biodiversity and societal frameworks to adapt. We also do not know at which temperature thresholds will be reached that can tip crucial climate systems into new runaway states – such as irreversible melting of the Greenland ice sheet (global sea level rise of 6 meters) or runaway die-back of the Amazon forest (negating our efforts in reducing atmospheric carbon dioxide (CO₂)). Therefore, 1.5°C should not be thought of as a finite limit, but rather as the lower end of a continuum that results in climate impacts shifting from serious to destructive, and ultimately to catastrophic (see figure below).

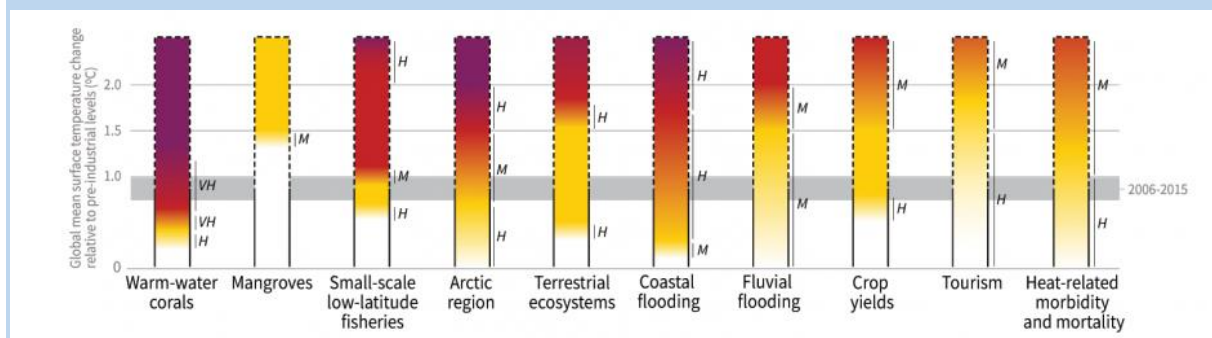


Figure 2: Climate change impacts and risks for selected systems as temperatures rise – white indicates no impacts, and purple shows very high risk of severe and/or irreversible impacts. The grey band denotes global temperatures for 2006-2015. (source: www.ipcc.ch/sr15)

What is the difference between a 1.5°C and a 2.0°C increasing in global temperature?

Human activities have already increased the global average temperature by 1.1°C and committed us to a further increase every decade. This means that global warming will reach 1.5°C by 2030⁷.

Africa, under the current climate, experiences one to three heatwaves per year. This could more than double at 1.5°C warming. From a food security perspective, every degree of global temperature rise could reduce global yields of wheat by 6%, rice by 3.2% and maize by 7.4%. This would put many African regions such as the African Sahel and Southern Africa at high risk of food insecurity⁸. An increase in temperature beyond 1.5°C will make it very challenging for the continent to establish any viable climate resilient development pathways⁹.

Limiting future global temperature increase to 1.5°C as opposed to 2°C could mean¹⁰:

- Approximately 420 million fewer people exposed to extreme heatwaves
- Reduced exposure to severe drought for 61 million people in urban areas

⁷ IPCC, 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (<https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>)

⁸ Findings of the IPCC Report on Global warming of 1.5°C as interpreted by: https://www.fint.awsassets.panda.org/downloads/backgrounder_africa_at_1_5c.pdf

⁹ IPCC, 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability. Summary for Policymakers. Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (approved version) (<https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/>)

¹⁰ Findings of the IPCC Report on Global warming of 1.5°C as interpreted by: <http://climate.nasa.gov/news/2865/a-degree-of-concern-why-global-temperatures-matter>

- Avoiding a 7-10% loss of rangeland livestock
- As much as several hundred million fewer people susceptible to climate-related poverty risks by 2050
- Reduced risk of heat related illness and mortality

At a local scale, the Western Cape would also be subject to more extreme weather and climate patterns, impacting on the important wheat, fruit and vegetable production taking place here and the associated value chains.

It is worth repeating: Time is running out. Reaching the 2030 and 2050 emissions reduction targets requires drastic 'cleaning up' of industrial and agricultural processes that release greenhouse gases and a reduction in our reliance on fossil fuels within the current decade¹¹. Greater ambition is definitely to be strived for, and accordingly the Western Cape Green Economy Strategic Framework has an ambition to "...position the Western Cape as the lowest carbon province in South Africa and the leading green economic hub of the African continent"¹².

Similarly, **a shift is required in understanding the climate vulnerabilities and risks to the communities, landscapes, infrastructure and sectors of the Western Cape.** Resilience building also requires an enhanced understanding of near and long-term adaptation measures that avoid maladaptation. It requires an appreciation of the inevitable climate related disasters – whether they be in the form of pests, floods, droughts, heat waves, cold snaps, fires, or storms, as well as the possible response measures that can be implemented.

The impacts we have already endured from the recent drought and other climate events (see Table 1 in the Annexure on climate change science), and now COVID-19¹³, express the need for an economic pathway that is climate-proof, ecologically sustainable and resilient to natural disasters (a 'Green New Deal') and that offers opportunities during a Climate Emergency.

In responding to climate change, we must re-imagine our approaches to economic development and initiate the required shifts in key sectors that drive the economy, such as agriculture, tourism and manufacturing. We need to match our responses to the expected conditions and make all infrastructure resilient. Our investments also need to be channelled towards more resilient economic activities and low-carbon energy.

¹¹ UNFCCC, 2021. Report of the Conference of the Parties on its twenty-sixth session, held in Glasgow from 31 October to 13 November 2021: Part two: Action taken by the Conference of the Parties at its twenty-sixth session. https://unfccc.int/sites/default/files/resource/cp2021_01_adv..pdf

¹² https://www.westerncape.gov.za/assets/departments/transport-public-works/Documents/green_is_smart-4th_july_2013_for_web.pdf

¹³ Coronavirus disease 2019 (COVID-19) is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case was identified in Wuhan, China, in December 2019. It has since spread worldwide, leading to an ongoing pandemic.

VISION 2050

Climate change is recognised globally as an 'Emergency'¹⁴, and immediate systems change are required to achieve emissions reductions by 2030 and maintain a habitable planet. In the Western Cape, however, our emphasis is on the impacts of climate change that are already undermining our hard-won social and economic development gains. An accelerated response is required to address the threats and opportunities posed by climate change across the spectrum of service delivery and economic activities in the Western Cape.

This Western Cape Climate Change Response Strategy (WCCCRS) guides the bold shifts required by 2030 in order to ensure we create social and economic resilience in times of climate destabilisation, whilst meeting our emissions reductions obligations.

Our Vision is to be a net zero emissions and climate resilient province by 2050, built on an equitable and inclusive economy and society that thrives despite the shocks and stresses posed by climate change

Building on a solid policy and institutional foundation, the Western Cape province needs to accelerate the implementation of response actions that will mitigate climate change and increase our general resilience to the changing conditions. The response must be well underway by 2030 if we are to achieve the long-term outcomes. This response will align with provincial priorities of providing safe and cohesive communities, promote job and economic growth, mobility and spatial transformation as well as inspire innovation and culture amongst its citizens.

Accordingly, four **Guiding Objectives** have been identified, giving structure to the aspiration expressed in the Vision. These four Guiding Objectives are used to structure the strategy, although the transversal nature of climate change implies some overlap between the objectives. The four objectives are:



Responding to the climate emergency



Transitioning in an equitable and inclusive manner to net zero emissions by 2050



Reducing climate risks and increasing resilience



Enabling a Just Transition through public sector, private sector and civil society collaboration

¹⁴ <https://www.unep.org/explore-topics/climate-change/facts-about-climate-emergency>

OUR STRATEGY

OVERVIEW

Our vision of a resilient, net zero Western Cape needs to be matched to a pathway broadly describing the changes or investments required to transition our current situation to the 2050 goal, which will give us our waypoints and allow us to track progress. Given that this Strategy is envisaged as a response framework, which will be matched to a more detailed implementation plan, we construct a response pathway that does not delve into sector-specific targets as such, but rather provides the necessary trajectory boundaries that will keep our continued response aligned to our four guiding objectives.

The four Guiding Objectives structure the narrative, with each Guiding Objective unpacked in the form of a Climate Action Pathway that specifies key actions along the journey to 2050.



Figure 3. Structure of the WCCCRS Vision 2050

Our Implementation Plan, to be developed following the publication of the response strategy, will detail the response actions and specific quantified targets through further consultation with sector experts, civil society, private sector stakeholders and other specific groupings, as well as government entities. The Implementation Plan will also identify where existing projects and programmes align with the Response Pathway, and where responsibilities lie for bringing programme into alignment or starting new work where gaps exist.

It should be noted that this Strategy covers the geographic region of the Western Cape, and thus is inclusive of all stakeholders and interest parties in both the private and public sector.

OBJECTIVE 1: RESPONDING TO THE CLIMATE EMERGENCY

We are currently in the 'now or never' decade¹⁵ as far as reducing the scale and impacts of climate change goes. Although no change to the climate would be the ideal, we are on a trajectory for 3°C rise in average global temperature by 2100 with increases in continental temperatures and temperature extremes in Africa being particularly severe¹⁶. Historic behaviour and consumption patterns, especially those associated with large-scale industrialisation and energy-intense lifestyles in wealthy countries, have already committed us to the effects of a 1.5°C rise in average global temperatures by 2040, as compared to conditions a century ago. The locked-in impacts, and scale of the effects on our day-to-day existence, have prompted over 1 900 local governments, 24 countries and the European Union to declare a 'Climate Emergency' (as at October 2021).

However, we potentially still have it in our power to avoid a further increase beyond the 1.5°C rise, and associated deepened impacts, but this window of opportunity is only open until 2030¹⁷. Deferring action further will make it increasingly hard (if not impossible) to achieve the global goal of limiting warming to current levels. Given a limited GHG 'budget' for global emissions until 2030, in accordance with a net zero target for 2050, we can see from Figure 4 that time is quickly running out.

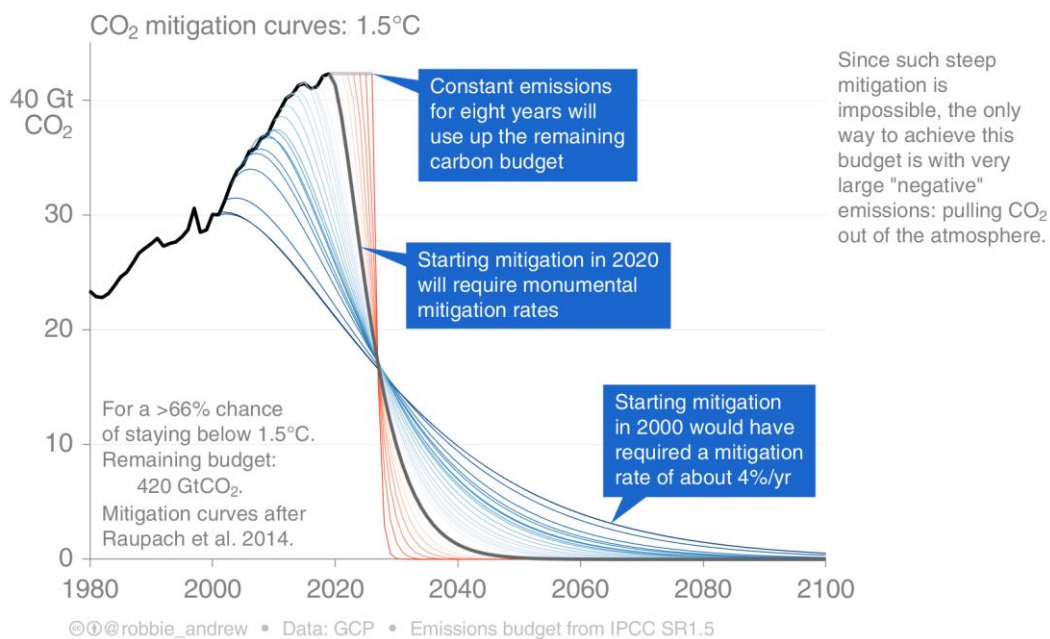


Figure 4. GHG emissions mitigation required for a 1.5°C global trajectory (<https://folk.universitetetio- oslo.no/roberan/t/global-mitigation-curves.shtml>)

¹⁵ United Nations General Assembly – High level Meeting on Climate and Sustainable Development, 28 March 2019 <https://www.un.org/press/en/2019/ga12131.doc.htm>

¹⁶ IPCC, 2021. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (<https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>)

¹⁷ IPCC, 2018. Special Report on Global Warming of 1.5 °C <https://www.ipcc.ch/sr15/chapter/spm/>; The UN Sustainable Development Goals <https://www.un.org/sustainabledevelopment/climate-action/>

Not only do we have to urgently address the required emissions reduction, but we also must take action in respect of adapting to the now inevitable impacts of climate change. Whilst overall Western Cape conditions will heat up and dry out, sudden, extreme climatic events will result in natural disasters that take a toll in terms of lives, livelihoods, infrastructure, ecosystems and the viability of certain economic activities. Common sense, backed up by science, says that if we are already struggling to assure human wellbeing at a 1.1°C rise, then it will become very hard by the time we reach a 1.5°C rise. At 3°C, many of the adaptation options would be impractical due to the significantly altered climatic conditions¹⁸. By way of example, building seawalls will only protect against initial sea level rise, but at a higher level, the only alternative would be a retreat out of the at-risk area.

Although a sub-national region like the Western Cape has limited control over the global impact that climate change will have, we do have the power to choose how to respond, and to take a leadership approach. Climate change will reconfigure economic competitiveness regionally and globally, and effective investment in climate adaptation could serve as a critical catalyst for increased economic competitiveness of the Western Cape, particularly in Africa, and amongst other agricultural regions.

A 2017 study commissioned for the Western Cape shows that where climate change serves as a driver for proactive investment in climate adaptation, the net economic impact of climate change could be positive in the province – avoiding a 17% economic contraction and growing an additional 14%. However, since climate change and climate adaptation investment will not affect all sectors equally, a balance will need to be struck between making existing sectors more resilient and promoting new economic activities that take advantage of the climate change response¹⁹.

Response Pathway

Our Climate Action Pathway in respect to responding effectively to the Climate Emergency requires a rapid shift in cultural response to risk and resilience, whilst doing our part in the global mitigation of greenhouse gas emissions. The first critical step is in acknowledging the severity of the societal predicament at hand, and that all sectors must contribute towards a safer Western Cape.

In the next few years, we have to make sure that our Disaster Risk Reduction and Response systems are climate-ready, and that we avoid spatial and development planning decisions that place people and infrastructure in harm's way. By the end of the 'Climate Decade', we must have better access to national and international climate finance, and have a plan in place to ensure water security in the province – for both economic activity and individual households.

¹⁸ IPCC, 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (<https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>)

¹⁹ Western Cape Government, 2018. Assessment of the Economic Risks and Opportunities of Climate Resilient Investment in the Western Cape: <https://www.westerncape.gov.za/eadp/about-us/meet-chief-directorates/environmental-sustainability/climate-change>

In response to the Climate Emergency, we will -*By 2025:*

- Bolster our disaster management response by ensuring that early warning systems provide long-term (decadal) climate forecasts and improved extreme weather assessments and that effective communication systems are in place
- Ensuring that spatial planning and development planning reduces risks to people, infrastructure and assets through integration of climate change considerations
 - Make sure new-build projects take climate risks into consideration, both in terms of the placement of infrastructure and communities, and in terms of building in resilience and building back better to suit a changing climate
 - Reduce coastal risks and public liability through the implementation of coastal management lines in spatial planning, and managed coastal retreat where necessary
- Increasing awareness of the climate emergency amongst the citizens and the civil service of the province and ensuring they have access to information
- Detail a roadmap and mechanism for the formulation of sector-specific climate change response strategies
- Identify ways to manage our release of short-lived climate forcers such as methane and black carbon, linked to the Western Cape Air Quality Management Plan

By 2030:

- Access international climate finance to stimulate and support climate-responsible economic and social development or investment
- Advance fossil fuel disinvestment by public funds
- Ensure that a water security plan is in place
- Capacitate people living in informal settlements to become resilient through innovative responses to climate risks

OBJECTIVE 2: TRANSITIONING IN AN EQUITABLE AND INCLUSIVE MANNER TO NET ZERO EMISSIONS BY 2050

A transition to a net zero emission future by 2050

It is the Western Cape Government's intention to become a net zero emissions province by 2050 as part of our commitment to the international *Under2 Coalition*²⁰. This is an ambitious target, but can be achieved if efforts to decarbonise energy, transport, industry and the built environment are aligned at a local, provincial and national level. The required behavioural changes, and low-carbon lifestyles, will be supported by technological transitions, which will be implemented in the Western Cape as part of the economic growth and promotion of the circular economy. These transitions will also ensure that our understanding of climate impacts to new infrastructure, systems and industries is robust and that we do not build new risk into the economy and society of the Western Cape as we transition to a low-carbon economy.

BOX 3. Calculating GHG Emissions in the Western Cape – A Move Towards a full GHG Inventory

The Western Cape Government has been working on the completion of its first full GHG Inventory. While data quality and availability remains a challenge, the Inventory has been able to capture the GHG emissions from the following three key sectors – energy (which includes transport), Waste, as well as Agriculture, Forestry and Other Land Use (AFOLU)²¹ (Figure 5). Calculating or estimating emissions from the Industrial Process and Product Use (IPPU) sector remains a challenge.

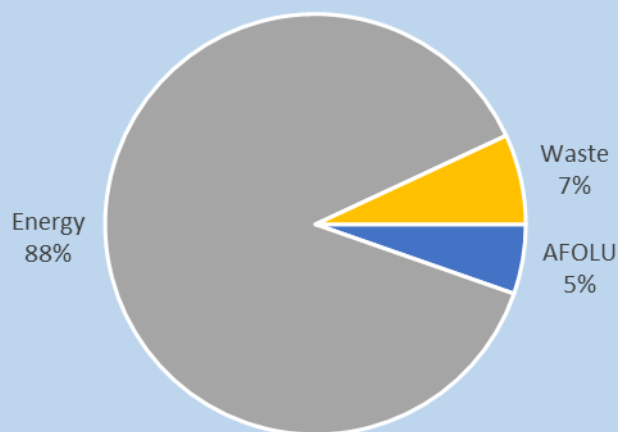


Figure 5: GHG emissions by sector for the Western Cape (excl. IPPU)

²⁰ The Western Cape Government is a signatory to the *Under2 Coalition*, which is a global community of state and regional governments committed to ambitious climate action in line with the Paris Agreement. Our commitment as signatory is to initially complete a 2050 Emissions Pathway exercise followed by a net-zero emissions target for 2050.

²¹ The breakdown is aligned with the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.

From the Western Cape GHG inventory, an estimated 39 846 932 tons carbon dioxide equivalent (CO₂e) was generated in Western Cape in 2018 (excluding the IPPU sector). The GHG emissions in the Western Cape are dominated by the energy sector, which is consistent with the national GHG inventory. The energy sector which is primarily based on the use of fossil fuels, such as electricity (from coal-fired power stations), diesel, petrol and coal for industrial purposes, has a very high global warming potential due to the emissions released from fossil fuel combustion. The shift towards increased renewables will play a role in reducing the emissions associated with the energy sector.

The IPPU sector emissions have been calculated, but due to concerns about data quality and missing data, this sector is being reassessed in order to ensure that an accurate picture of that sector emissions is included in future reporting. When assessing the contribution of the four sectors in the national GHG inventory and the Western Cape GHG Inventory, the sector breakdown is very similar. It is therefore suggested that the IPPU contribution will be between 5% and 7% of the total GHG emissions in the Western Cape.

A full report on the GHG inventory for the Western Cape has been drafted and includes the sector summaries, methodology for data collection and other relevant information. The report will be available on the DEA&DP website (www.westerncape.gov.za/eadp/).

Two crucial transitions are (1) a shift from internal combustion engines to electric mobility, and (2) a massive shift from fossil fuel-based energy to renewable energy sources. These expected shifts are deemed realistic, given the rapid development in renewable energy and energy storage technologies. Increasingly, the combination of the two will outcompete fossil fuels on cost, and therefore naturally facilitate a change in the energy and transport markets²².

The two transitions will have to form part of the broader 'just transition' that is taking place in the country. Both transitions will significantly impact the current industrial and employment composition in the country and systems need to be put in place in order to deal with these challenges and changes as the shifts start happening. Any transition needs to be done in a way that allows flexibility and innovation in the energy space, without locking the country or the province into long-term high GHG-emitting energy sources. This is particularly important when considering so-called 'transition' fuels in the shift from fossil-based energy sources to renewables.

In parallel to a longer-term emissions reduction programme, the province will require an immediate focus on **short-lived climate forcers**. Short-lived climate forcers - such as black carbon, methane, tropospheric ozone, and hydrofluorocarbons - have a shorter atmospheric lifetime but have a high global warming potential, meaning they

²² IRENA, 2017. Electricity storage and renewables: Costs and markets to 2030
<https://www.irena.org/publications/2017/Oct/Electricity-storage-and-renewables-costs-and-markets>

can warm the earth faster compared to carbon dioxide. Targeted efforts to reduce these emissions by 2030 can slow the pace of global warming by 0.6°C by 2050²³.

The need for a clean, low-carbon and modern energy system for all

Access to clean, adequate, affordable and reliable forms of modern energy is vital for human well-being and development²⁴. The lack of and/or limited access to modern energy results in the use of fuels such as wood, coal, candles and paraffin²⁵, all of which pose severe health and safety risks²⁶. Women and children are particularly vulnerable as they are exposed to these unsafe fuels for cooking, heating, and cleaning. Furthermore, in the context of climate change, access to modern energy is important for building resilience to the impacts of extreme weather events such as heat waves and extreme cold, and to decrease household resilience on high-emission domestic fuels.

Within the context of municipal financial insecurity, climate change offers unique and exciting opportunities to address energy poverty using cleaner fuels and alternative energy technologies while simultaneously unlocking employment opportunities. Municipalities will have to be innovative in the design of their energy service delivery, especially to the poor, and in line with community needs. These solutions are to consider gender aspects of energy use and challenges²⁷ as alluded to earlier.

Carbon costs as a key component of our economic planning

The rising cost of GHG emissions ('carbon') is a liability for the Western Cape economy, but a positive economic outcome is possible through low-carbon and climate resilient activities. Local economic activities and dependencies will be negatively affected by national or global carbon pricing, with the most exposed sectors being petroleum refineries, and all heavy electricity consuming industries such as iron and steel manufacturing.

As mentioned earlier, a 2017 study showed that by investing in improved climate resilience, the Western Cape economy could be 33% better-off in 2040 than if the province does not adapt effectively to the impacts of climate change. There will be sectoral winners and losers, and the benefit depends on adapting better than other provinces and adapting early²⁸. For example, the Western Cape province could benefit from increased demand for renewable energy stimulated by local or global carbon pricing, given the Western Cape Government's proactive stance in promoting the development of this sector.

²³ IPCC, 2018. Special Report on Global Warming of 1.5 °C <https://www.ipcc.ch/sr15/chapter/spm/>; The UN Sustainable Development Goals <https://www.un.org/sustainabledevelopment/climate-action/>

²⁴ International Energy Agency: <https://www.iea.org/articles/defining-energy-access-2020-methodology>

²⁵ World Health Organization (2016) Burning opportunity: clean household energy for health, sustainable development, and wellbeing of women and children. ISBN 978 92 4 156523 3

²⁶ Barnes et al., 2009; DOI: [10.17159/2413-3051/2009/v20i1a3296](https://doi.org/10.17159/2413-3051/2009/v20i1a3296)

²⁷ Sustainable Energy Africa, 2017 – Energy Poverty and Gender in Urban South Africa: <https://www.sustainable.org.za/uploads/files/file124.pdf>

²⁸ Assessment of the Economic Risks and Opportunities of Climate Resilient Investment in the Western Cape: <https://www.westerncape.gov.za/eadp/about-us/meet-chief-directorates/environmental-sustainability/climate-change>

Proactive investment in the sectors that will benefit directly or indirectly from an international carbon tax scheme, such as the recently announced 'Carbon Border Adjustment Mechanism' in the European Union, would serve the strategic interests of the provincial economy. The European border tax is proposed to initially apply to iron and steel, cement, fertiliser, aluminium and electricity generation sectors, but the related Farm-to-Fork strategy has a component related to mitigating climate change, and this component will place additional pressure on agricultural exports to Europe²⁹.

Given the socio-economic challenges of South Africa, this proactive **economic adaptation must take the form of a 'just transition' to avoid deepening inequalities and shedding more jobs**. At the same time, resource efficiency must be improved (reducing waste of valuable or rare materials, energy and water, and avoiding pollution), and low-carbon development which progressively has less reliance on fossil fuels must be pursued. Economically, this implies less exposure to carbon intensive commodities or resources that will increase in cost over time, a focus on employment in sectors with the most secure and low-risk futures, and social safety nets that reduce vulnerabilities to climate change and associated depletion of natural resources.

Certain economic sectors are likely to experience more difficulty than others due to their sensitivity to physical climate, cost margins or the transition to a low-carbon future. Some work has begun on developing *Sector Jobs Resilience Plans*³⁰ by the national Department of Forestry, Fisheries and the Environment, however, a substantial amount of investment needs to be made at a local level, i.e. in assessing the modes of shifting justly to a low-carbon future. This is particularly important as we emerge from the COVID-19 pandemic and focus on rebuilding economic activities. A 'green' recovery to the COVID-19 pandemic presents measures that provide 'shovel-ready' jobs of the kind needed to also lift economies out of the current recession. These types of jobs include the Public Employment Programmes such as the Expanded Public Works Programme and small, micro and medium enterprises support programmes and could include planting of trees, building flood barriers, restoring natural landscapes; protecting and updating infrastructure such as transport and communications networks³¹.

Response pathway

The Climate Action Pathway in respect to our net zero pathways and ambition require that critical targets are in place to steer investment and implementation planning. Raising the bar on our response in order to contribute to the collective societal change is required at this stage.

²⁹ TIPS, 2021. The European Green Deal: Context, Challenges and Opportunities for South African SMEs Operating in the Green Economy: <https://www.tips.org.za/research-archive/sustainable-growth/green-economy-2/item/4242-the-european-green-deal-context-challenges-and-opportunities-for-south-african-smes-operating-in-the-green-economy>

³⁰ Sector Jobs Resilience Plans: <https://www.tips.org.za/projects/current-projects/item/3936-sector-jobs-resilience-plans>

³¹ United Nations Environment Programme (2021). *Adaptation Gap Report 2020*: <https://www.unep.org/resources/adaptation-gap-report-2020>

In order to achieve an equitable and inclusive transition to net zero emissions by 2050, we will –

By 2025:

- Detail a plan to get the province to Net Zero by 2050
- Enhance soil carbon sequestration and other carbon sinks in the natural environment, in part through increased focus on conservation and regenerative agricultural practices
- Initiate work on a climate change sector strategy for Climate Resilient Development, ensuring that:
 - Low-emissions planning and budgeting being integrated into macro-economic planning
 - Net zero pathways have included climate change risk so that risk exposure to climate impacts is not inadvertently increased
 - Employment risks forecasting and planning for a just transition, specifically taking gender and youth into consideration, features in the planning for a shift of economic activities to low-carbon sectors
- Continue energy related programmes aimed at:
 - Facilitating greater access by all municipalities to renewable energy, including through independent power producer contracts
 - Actively encouraging innovation in energy services provision to accommodate renewable energy input and improve access to energy in low-income areas

By 2030:

- Detail an energy security and economic resilience plan for the province
- Continue with transitions in the Transport sector:
 - Investment and management of public transport systems including a strong focus on improving the functionality of rail services
 - Preparing for a rapid transition to electric mobility, in private and public transport and ensure that the infrastructure is in place
 - Champion renewable energy as the primary source of energy for electric vehicles
 - Integrate non-motorised transport into a low-carbon transport system.
- In the built environment:
 - Continue to improve resource efficiency, specifically addressing transport, land, water and energy efficiencies, as well as spatial planning challenges
 - To avoid GHG emissions emanating from waste, ensure that no organic waste is sent to landfills by 2027

By 2040:

- Phase out the use of internal combustion engines in public transport and public fleet vehicles
- Have significant local manufacturing in support of low-carbon activities (e.g. electric vehicle components, batteries, solar photovoltaic systems)

By 2050:

- Reach a net zero GHG emissions position in the Western Cape

BOX 2. South Africa’s global emissions reduction commitments

South Africa as a country has an international obligation to contribute to the mitigation of climate change, as captured in our commitment to the Paris Agreement. The Paris Agreement requires South Africa to submit a Nationally Determined Contributions (NDC) pledge every five years, the intention being that we scale up our ambitions for each succeeding five-year cycle.

Since 2015, some mitigation envisaged in South Africa’s original NDC may have been achieved, but mostly due to economic downturns and a decrease in demand for fossil fuel-based energy sources, rather than implementation of actions to respond to climate change. The original self-imposed targets were, however, not a sufficient ‘fair share’ contribution to the required global effort to limit the global temperature rise to 1.5°C (the ‘ambition gap’)³².

Based on recommendations from the Presidential Climate Commission, South Africa submitted a revised NDC to the UNFCCC in 2021 with a climate change mitigation target range for 2030 of 350 – 420 Megatons (Mt) of Carbon Dioxide equivalent (CO_{2e}). The lower bound of this range lies at the point considered to be South Africa’s fair share contribution to the 1.5°C ambition (Figure 6).

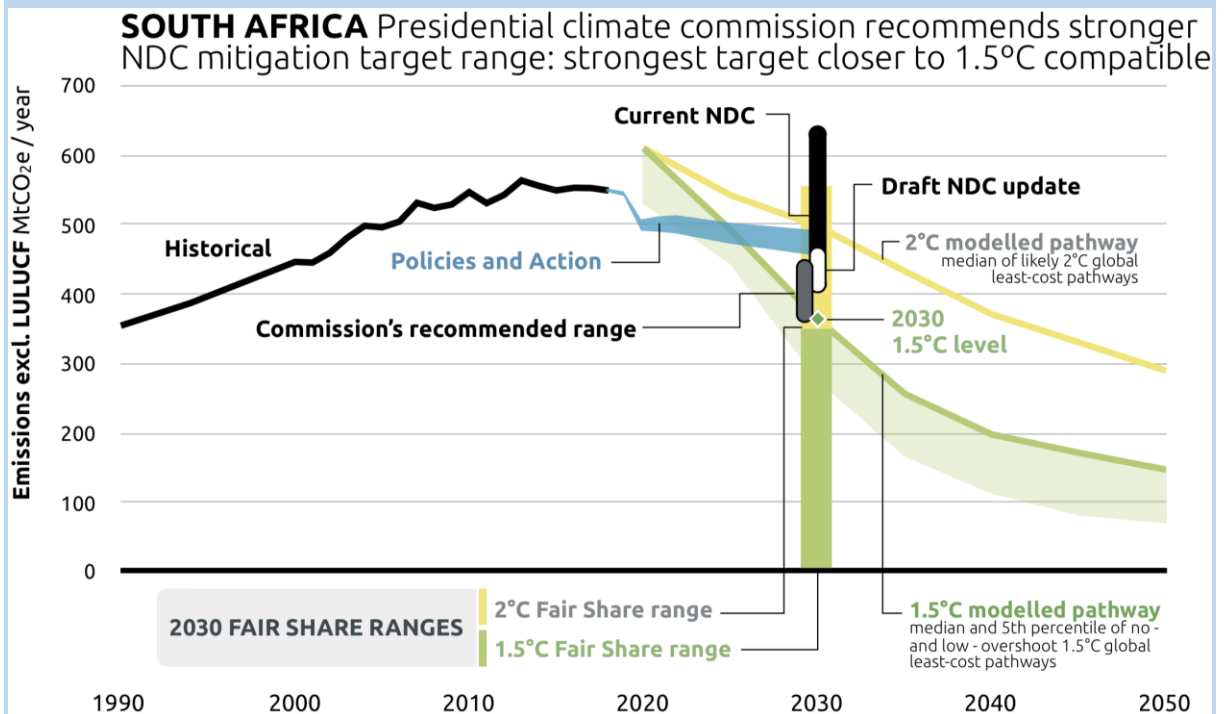


Figure 6. South Africa’s fair share GHG mitigation compared to current country ambition

(<https://climateactiontracker.org/blog/south-africas-presidential-climate-commission-recommends-stronger-mitigation-target-range-for-updated-ndc-close-to-15c-compatible/>)

³² <https://climateactiontracker.org/countries/south-africa/>

OBJECTIVE 3: REDUCING CLIMATE RISKS AND INCREASING RESILIENCE

Climate change is already having substantial impacts in the Western Cape and cases of simultaneous extreme events in the future will compound risks such as reduced food production across the agricultural value chain and fisheries, increased heat related mortality, heat related loss of labour productivity and flooding. Further, biodiversity loss is predicted to increase due to changing climatic envelopes. This could result in biomes shifting across regions thus changing grazing lands and species habitats. These threats could prompt mass migration as people move to areas where they see opportunities for viable livelihood systems.

The risks and impacts of climate change can be reduced through adaptation measures – actions by humans and nature to adjust to the new conditions. The end goal is to improve our 'climate resilience'; i.e. the ability to buffer ourselves from the impacts of climate change and maintain our way of life. However, our capacity for adaptation is determined in part by the severity of the changes, and in part by systemic social and economic limitations. The longer we wait, the fewer opportunities for adaptation remain available.

Well-managed natural systems, that can cope with the increasing climate impacts are pivotal to the overall success of the Western Cape as a whole, and in implementing the Climate Change Response Strategy into the future. This will require not only strategies to maintain ecosystem form and function where it still exists, but concerted efforts to restore and regenerate ecosystems wherever possible, and particularly in regions at risk from climate impacts.

The Western Cape needs to adapt much faster than at present, as there is a rapidly closing window of opportunity to take bold climate action to reduce the climate risks and build resilience. We can no longer make investment and development planning decisions that undermine our natural capital; and a new regenerative approach is required. It is fundamentally important that that adaptation actions are implemented in concurrence with the rapid efforts of drastically reducing GHG emissions.

Agriculture has a key role to play and is already leading in promoting farming practices that both restore soils and relationships with surrounding ecosystems, to reduce risks in drought years, risks from fires, floods, and pests.

The agricultural sector is important to the economy of the Western Cape; it is pivotal for food security, and yet is, by nature, highly sensitive to climatic changes. The sector is also the single largest user of water in the province. Agricultural droughts over the past decade have continued unabated especially in the inland districts. As citizens of this province, we are all intimately aware of the impacts of the drought especially when it also impacted our urban areas in the period 2015-2019. We have learnt valuable lessons through this severe event, that water is the currency of our economy, and needs to be maintained, banked and preserved in its purest forms, firstly in nature where it is produced, and secondly in our supply systems through which it is managed. The drought incidence also highlighted the need for accurate data collection and analysis of the data to inform development of early warning systems.

Significant work has been undertaken over decades in the Western Cape to map, document, and detail our understanding of our biodiversity, ecosystems, freshwater supplies, and soils. Ecosystems form the underpinning life support systems for humans, the ecological 'capital' and 'infrastructure' that we cannot do without. Yet they continue to be under threat, with more biodiversity lost than restored or protected³³.

The Western Cape's biological diversity and natural resources are under threat from pollution, overexploitation, invasion by alien plant species and irresponsible development – and this translates into a threat to our society and economy. Our land- and ocean-based ecosystems are also under threat from climate impacts, and need protection through long-term preparedness and forward planning³⁴.

The scale of investment requires a rapid about turn – with ecosystem regeneration, restoration and maintenance programmes on expansive scales, that will help buffer us from the impacts of climate change. The Ecological Infrastructure Investment Framework compiled by the Western Cape Government³⁵ makes it clear that ecological resources are key to successful climate change adaptation, and the future of nature-based industries such as agriculture. This is the United Nations Decade of Restoration³⁶, and for good reason – restoration and regeneration of ecosystems are also pivotal in reducing our carbon emissions in addition to all the other life supporting services they provide.

BOX 5. Disasters and drought

90% of all disasters globally are now climate related, and the latest science points to the attribution of climate change being a driver behind many extreme weather events³⁷. We need to formally recognise the economic costs and risks of climate related disasters as ones that we are witnessing will increase in magnitude and frequency.

In response to the climate change driven drought of 2015-2019, the cumulative totals of the impact of the drought are still being calculated on an ongoing basis. Drought impacts cost R14 billion in the agriculture sector alone. In addition, a single severe storm, and Knysna fires in June 2017 caused R4 – 6 billion losses in damage; the avian influenza outbreak (associated with the drought) caused losses of R800 million to the poultry sector. Over 30 000 seasonal jobs in agriculture were lost. The responses in reactive disaster funding have been but a fraction of the economic cost: R1 billion in 2017; and close to another half a billion rand was requested from national disaster management funds in 2018³⁸. The situation is a clear indicator of the economic cost of failure to adapt to climate change. Proactive planning and adaptive measures rather than reactive measures are likely to be less costly.

³³ State of Environment Outlook Report: Biodiversity and Ecosystem Health:

https://www.westerncape.gov.za/eadp/files/atAoms/files/04_Biodiversity%20and%20Ecosystem%20Health.pdf

³⁴ State of Environment Outlook Report: Biodiversity and Ecosystem Health:

https://www.westerncape.gov.za/eadp/files/atoms/files/04_Biodiversity%20and%20Ecosystem%20Health.pdf

³⁵ Available from the Department of Environmental Affairs and Development Planning

<https://www.decadeonrestoration.org/>

³⁷ National Academies of Sciences, Engineering and Medicine. 2016. Attribution of extreme Weather Events in the Context of Climate Change. Washington, DC: The National Academies Press. Doi: 10.17226/21852.

³⁸ Personal communication, Western Cape Disaster Management Centre

Response pathway

The Climate Action Pathway in respect of reducing risk and increasing resilience focuses on using investment in natural capital as a means to take advantage of opportunities and will aim to restore ecosystem functioning at scale. Further, adaptation business cases could be used to leverage the much-needed private sector finance to close the adaptation gaps for the province. Immediate actions must remove people out of harm's way, and start protecting our water resources. Equally, the roll out of education and public awareness initiatives constitutes a major component of climate adaptation because understanding of climate change could help people to anticipate future risks and adapt to these. Responding to climate change presents an opportunity to integrate climate risk management into social protection programmes such as the public works programmes that employ people to restore ecosystems.

To reduce risk and increase resilience, and through investment into restoration and enhancement of our natural capital, we will -

By 2025:

- Continue with efforts at removing alien vegetation infestations
- Ensure that climate change is a consideration in all Disaster Risk Assessments
- Have plans in place to prepare for, and for dealing with extreme heat events
- Update the SmartAgri plan³⁹ and deepen its implementation in pursuit of building of climate resilience across the agricultural sector
- Detail an Adaptation Pathway for the Western Cape

By 2030:

- Coordinate Ecosystem-based Adaptation activities through the implementation of the Western Cape Ecological Infrastructure Investment Framework
- Ensure involvement of local communities by applying community-based adaptation principles in resilience-building programmes
- Manage ecosystems, wildlands and the conservation estate through:
 - Ecosystem restoration, including restoration of degraded agricultural areas, as a method for preserving the full suite of ecosystem services, thereby reducing extreme fires, maintaining soil integrity, improving water resource management and reducing risks to people and agricultural production
 - Increasing formal protection of conservation areas
 - Soil restoration linked to conservation agriculture practices
- Expand natural systems in urban environments (or utilise ecological infrastructure approaches where this is not viable) and restore their functioning to reduce vulnerability to climate change and its effects
- Increase food system resilience by
 - protecting well-located agricultural land
 - supporting urban agriculture
- Restore the ecological functioning and water quality in our watercourses, by:
 - Rehabilitating of degraded riverine and wetland habitat
 - Halting water pollution

³⁹ Western Cape Climate Change Response Framework and Implementation Plan for the Agricultural Sector

- Ensuring the proper functioning of wastewater treatment plants
- Reduce coastal risks through development management, reinforcement and deployment of natural defences
- Mitigate the risk of wildland-urban and wildland-agriculture interface fires through appropriate ecosystem management and support for Fire Protection Associations
- Improve our Disaster Risk Reduction by:
 - Prioritising disaster risk management strategies that recognise the specific vulnerabilities of women and the youth, and equip them with the knowledge, skills and resources to be more resilient
 - Identifying adaptation actions that proactively respond to inevitable future extreme circumstances such as heat waves, storms, flooding, drought and fires, both in sudden onset and chronic disaster forms, in the form of locally appropriate climate change responses
 - Enhancing the capacity of people to respond to climate impacts and avoid informal settling in at-risk areas

By 2040:

- Achieve universal access to basic services as a fundamental requirement for a resilient population

OBJECTIVE 4. ENABLING A JUST TRANSITION THROUGH PUBLIC SECTOR, PRIVATE SECTOR AND CIVIL SOCIETY COLLABORATION

Vulnerable people are most affected by climate change

Climate change is often a multiplier factor, adding to the already existing high levels of poverty, inequality and vulnerability in South Africa. This means **climate change is a human rights issue** as it has the potential to exacerbate existing human rights infringements and undo any achievements made in this area. Apart from threatening our very existence, climate change bears harmful impacts on the rights to life, health, food, water, housing and livelihoods and service delivery – or lack thereof.

Inequality and the climate crisis are interwoven, and **climate change does not manifest universally – some people are more vulnerable than others**. It is important to note that the impacts of climate change usually reinforce existing inequalities: depending on who we are, where we live, and what livelihoods we depend on. As such, impacts of climate change are disproportionately felt across communities due to differential adaptive capacity related to wealth and resource status, leading to increased climate-related economic migration or mobility in the jobs market. Furthermore, women, children and the elderly are more likely to be negatively impacted in many instances. This is linked to a variety of causes and impact pathways. The elderly are often prone to severe health impacts especially if they are already frail or sickly. Notably women and children are more impacted through negative health related issues, through reduced access to water and food, and for women in having multiple carer responsibilities often on top of other paid work as well, or conversely could be unemployed due to care duties. This should not discount the impacts on boys and men though, especially where seasonal employment leads to social ills and mental health issues.

BOX 6. Gender and Climate Change

Impacts of climate change are experienced differently between men and women. Quite often, women bear a disproportionate burden of the negative climate change impacts. The Western Cape presents a microcosm in which the effects of gender inequality continue to present themselves.

Traditional gender roles are still perpetuated in many sections of society, with men often focussed on employment and earning wages while women are primarily viewed as care givers, undertaking work for which they usually receive little or no remuneration or fulfilling the gendered role in addition to formal employment. In this context, duties associated with the women's role include cooking, cleaning, subsistence agriculture, child minding, nursing the infirm, securing water and fuel for the household. Such tasks restrict the opportunities for women to partake in mainstream economic activities, while possibly also posing safety concerns for women⁴⁰. Climate change will affect how these dynamics play out in society.

⁴⁰ Caroline Sweetman & Louise Medland, 201. Introduction: gender and water, sanitation and hygiene, Gender & Development, 25:2, 153-166, DOI: 10.1080/13552074.2017.1349867. Accessed June 2020

Gender-based violence is a major concern for South Africa given that femicide among other forms of gender-based violence is five times higher in the country than the global average. The country is reported to have the fourth highest female interpersonal violence death rate out of 183 countries that were ranked by the World Health Organisation in 2016⁴¹.

Also linked to safety concerns is the role that women play when disasters occur. Natural disasters are projected to occur more frequently due to climate change, a situation that amplifies safety concerns for women and girls as studies have shown that women are fourteen times more likely to die in a disaster than males due a number of reasons including women remaining in the disaster zone trying to help or ensure that children and elderly family members are safe⁴². Even post the disaster, women are often excluded from the rebuilding process and future disaster planning thus limiting their capacity to respond better when similar disasters or extreme events occur in future⁴³. Side-lining or minimal consideration of the women's voice in decision-making also transcends to the work area, more so, in institutions where men predominantly hold high level positions and are responsible for decision making. Collectively therefore, the biophysical, social, emotional and financial strain that women experience contributes to factors that magnify existing inequalities which in turn increase women's vulnerability; while reducing their ability to cope with effects of climate change.

The challenges that women face are acknowledged globally through instruments such as the Paris Agreement of 2015, 2030 Agenda for Sustainable Development and the Convention for Elimination of Discrimination Against Women. The [5th Assessment Report of the Intergovernmental Panel on Climate Change](#)⁴⁴ presents evidence of increased gender inequalities due to climate change with suggestions that the situation could further perpetuate the vulnerability of marginalized women to severe impacts of climate change if a gender sensitive approach is not prioritised in the climate response plans. These instruments acknowledge the need for women's voices to influence policy and decision-making, with an emphasis on ensuring that climate action takes cognizance of current gender imbalances and the opportunities presented for rectification. To address disparities of gender inequality, South Africa developed the [National Policy Framework for Women's Empowerment and Gender Equality](#)⁴⁵ which outlines the country's vision and ensures that building resilience and achieving gender equality are core to the transformation process.

Under the auspices of this national framework, the Western Cape Department of Environmental Affairs & Development Planning is championing gender mainstreaming into sectoral/thematic strategies and action plans. The framework integration is being undertaken through a stepwise participatory process of revising and engendering the WCCRS. As an initial step, the Climate Change Directorate used qualitative research techniques supported by a combination of gender analysis tools to understand the current gender gaps within identified socio-economic and development sectors in the province. Information gathered through the Gender Gap Analysis sets a basis for the subsequent participatory stakeholder engagement phase which is set to give a picture of the differences in gender roles, needs and opportunities across the identified sectors and the province at large. The engagement process

⁴¹ <https://mg.co.za/special-reports/2020-12-04-gender-based-violence/>

⁴² <https://www.who.int/life-course/news/commentaries/women-children-adolescents-in-emergencies/en/>

⁴³ Rex, Helene Carlsson; Trohanis, Zoe.2012. Making women's voices count: integrating gender issues in disaster risk management overview and resources for guidance notes (English). East Asia and the Pacific Region sustainable development guidance note; no. 0. Gender and disaster risk management Washington, D.C: World Bank Group. <http://documents.worldbank.org/curated/en/723731468234284901/Making-womens-voices-count-integrating-gender-issues-in-disaster-risk-management-overview-and-resources-for-guidance-notes> (Accessed 04 March 2021)

⁴⁴ IPCC, 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (<https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/>)

⁴⁵ South Africa's National Policy Framework for Women's Empowerment and Gender Equality (https://www.dffe.gov.za/sites/default/files/docs/national_policy_framework.pdf)

will further highlight and acknowledge progress that has been made in addressing gender disparities as well as identify opportunities to design a gender responsive climate action plan that will be implemented to promote resilience building while reducing rather than exacerbating inequality in the province.

The important role of government

Response action can, and must, be led by government, responding to both threats and opportunities across the spectrum of economic and social development, and government services. The Western Cape is striving to amend many injustices of the past, and to advance the wellbeing of citizens of the province as it relates to job security, economic activity, safety and health of communities. Without incorporating a climate change-responsive approach in government programmes, we cannot create the necessary momentum for collective action – with government providing an accommodating space for private sector investment. It should be noted that climate action (esp. mitigation) need not result in new systems or require additional budget; it can be driven by current issues and mainstreamed through existing governance systems and innovative planning. It must be emphasised though that governance for climate resilient development is most effective when supported by the public and private institutions, and practices are well aligned across scales, sectors, policy domains and timeframes.

Implementation of the existing climate change response strategy has thus far been too slow. The 2014 Western Cape Climate Change Response Strategy⁴⁶ was approved by the Western Cape Cabinet. Although a number of sectors have taken the lead in implementing the identified climate change responses, much of the work undertaken has responded to the 'low-hanging-fruit'⁴⁷. This includes situations where efficiencies could easily and cost-effectively be improved, or where resource efficiency was required under disaster response situations (such as the 2015-2019 drought). The more challenging aspects of adaptation that require significant financing and systems change, along with unpacking many of the economic externalities of the past, are yet to be fully tackled, leaving a significant adaptation deficit for the province to be well-prepared for the imminent climatic impacts.

The current decade will include two cycles of WCCCRS implementation and is pivotal not only for the citizens of the Western Cape, but for South Africa and globally. The kind of scale and speed of systems change required globally indicates that significant investment and effort now have to be put into the more challenging and systemic responses to climate change – and this is applicable to both mitigation and adaptation responses.

The WCCCRS cannot remain a stand-alone policy that is not fully integrated across Western Cape Government as it provides the overriding policy direction for achieving the low-carbon and climate resilient objectives of the province. The guidance from the WCCCRS must feed directly into the implementation of the Provincial Strategic Plan, and feature fundamentally in the core of service-delivery of the province (via

⁴⁶https://www.westerncape.gov.za/text/2015/march/western_cape_climate_change_response_strategy_2014.pdf

⁴⁷https://www.westerncape.gov.za/eadp/files/atoms/files/Biennial%20Climate%20Change%20ME%20Report%202020_f inal.docx.pdf

the Annual Performance Plans, performance metrics of all staff, and the nature of financial resource allocation) – as recommended by an independent evaluation undertaken of the 2014 WCCCRS⁴⁸.

It is important that the climate governance is driven from a senior and executive government level – at a national level, the President has established a Presidential Climate Commission (as required by the Climate Change Bill) to take a holistic view of how climate change responses should form part of socio-economic development and disaster risk management in South Africa. This should be matched at a Provincial level, for effective intergovernmental engagement and localisation of the prescripts of the forthcoming national Climate Change Act. Although there has been a climate change forum and an internal working group within Western Cape Government in the past, the institutional arrangements require increased engagement by the leadership of the province, both internally within government and with a broad range of stakeholders and leaders in the private sector, civil society and academia.

The Western Cape Government, the City of Cape Town, numerous local governments and private sector entities in the Western Cape have signed up to bold and ambitious climate change targets. The Western Cape Government for example has signed up to the *Under2 Coalition* – with the intention to become a net zero emissions province by 2050. This is an ambitious target, that can only be met with bold and ambitious leadership from the highest level of government, across to senior leaders and executive level in both private and public sectors. The City of Cape Town is a *C40 Cities*⁴⁹ member, and has signed up to C40's *Deadline 2020* programme, which aims to put cities on track to meet the goals of the Paris Agreement and achieve carbon neutrality and climate resilience by 2050.

Response pathway

Our Climate Action Pathway in respect of an equitable and inclusive transition will strive to reduce vulnerabilities and specifically improve on the representation of gender and youth in climate change responses. This will be achieved through innovation in how government structures include a science-based and participatory perspective in their decision-making, and a focus on planning inclusive transitions in key sectors. The end goal is to ensure the people of the Western Cape can access the services they require for climate resilience, and that their voice is heard in the planning of the climate resilient development path.

To enable a Just Transition through collaboration between government, the private sector and the public, we will -

By 2025:

- Initiate a Climate Assembly, within a broader participatory engagement platform, to ensure that the voice of the citizenry is heard, and that the immediate needs of communities are responded to within the context of climate resilient development. This must serve especially those societal groups previously

⁴⁸ A review done for the Climate Change Directorate of DEA&DP in 2018 – available from the Department on request

⁴⁹ <https://www.c40.org/>

marginalised like women and the youth, and provide an accountability platform to government for the necessary response planning and actions

- Firm up the governance framework for climate change response by:
 - Convening a climate change advisory committee associated with the Office of the Premier that is also aligned with the requirements to be put in place by the forthcoming Climate Change Act
 - Using the Western Cape Climate Change Forum to coordinate, facilitate and share information on climate change responses among all stakeholders
 - Involving local government in appropriate coordination bodies ensuring vertical integration, that local authorities are supported in accessing opportunities for facilitating climate response actions, and that cross-boundary issues are addressed
- Support Sustainable Public Procurement to support low-carbon and more socially responsible goods and services
- Create reporting mechanisms that will collect climate change related data, with a specific focus on gender disaggregated data
- Prioritise the capacitation of local government, as local government programmes are often leading the climate change response

By 2030:

- Through red-tape reduction and incentive schemes, create an institutional environment that encourages private sector innovation and investment in climate-proof development projects
- Collaborate with provincial development facilitation programmes, to provide stimulus for private sector responses that align with the vision and objectives for climate change response
- Adjust government financial systems to prioritise low-carbon development, by:
 - Building capacity and aligning the protocols, guidance and assessment criteria for government financial structures to mainstream low-carbon, climate-proof planning, budgeting and procurement
 - Improving monitoring and reporting on implementation and impact of climate-resilient activities, and provide for innovation in funding types
 - Developing systems to enable climate budget tagging
- Ensure that government services have a positive impact on human welfare indices:
 - The provision of basic services that takes a long-term view which is climate-proof
 - Design innovative energy service delivery for low-income communities, particularly looking at cleaner fuels and alternative energy technologies
 - Mainstream climate change linked resilience thinking into social welfare systems that extend to food security, and mental health support
- Formulate a plan to adapt our health systems to the realities of a harsher climate and increased vulnerabilities, focussing on:
 - Bolstering the capacities and climate awareness of community health worker networks
 - Making sure that early warning systems improve health sector responses to extreme events
- Expand national and international networking, exchange programmes and learning from other regions, such as through the *Under2 Coalition*

- Continuously improve the Monitoring & Evaluation system related to climate change
- Use regular assessments to interrogate and adjust the WCCCRS
- Among other tools, using the Environmental Implementation Plan to ensure alignment of climate change responses between the different provincial government departments and national counterparts, and between provincial projects and programmes
- As appropriate to different sectors, especially transport and energy, develop education, training and skills development plans

INSTITUTIONAL ARRANGEMENTS

Climate change impacts all sectors and the integration of climate change into existing policies and plans is considered the most effective way of mainstreaming the required climate change response. This approach builds increasing flexibility into planning decisions and helps to avoid 'lock-in' of systems or infrastructure which are not suitable to future climate conditions. Mainstreaming needs to be done at all levels of government. Engaging and working together across departments and spheres are therefore important for an integrated climate change response.

In 2017 the Provincial Cabinet escalated both climate change and water security as enterprise risks for the Western Cape Government. This requires all departments to include climate change (and water security) responses in their Annual Performance Plans; responses addressed how climate change will impact on sector department's operations, and what actions are being implemented to achieve improved resilience and decrease carbon emissions.

The Climate Change Bill, 2021, proposes that the premier's intergovernmental forum (in the Western Cape, the Premier's Coordinating Forum) also acts as a Provincial Forum on Climate Change. The Provincial Committee on Climate Change will be a political structure, and as such, needs to be supported at a more technical and administrative level by similar forums and structures focussed on the implementation of this Strategy. These may be formed within the organisational structures of government, or in partnership between government and representatives of civil society, academia and the private sector.

Accordingly, a support network is envisaged comprising of mostly existing forums that will provide for horizontal and vertical integration and alignment (Figure 7).

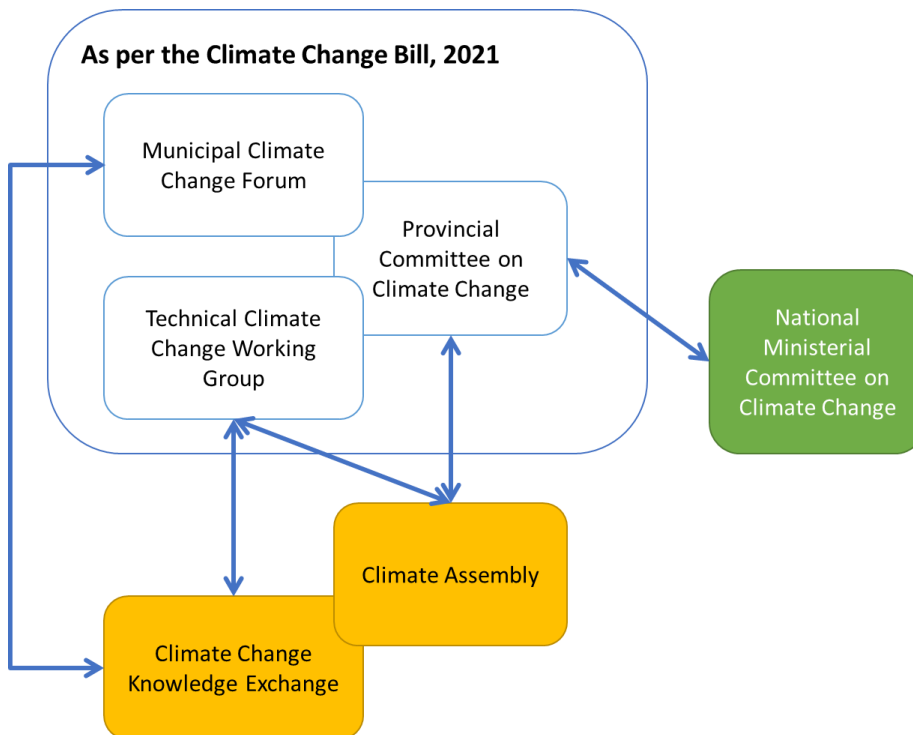


Figure 7: Institutional arrangements for climate change governance in the Western Cape

Provincial Forum on Climate Change

Purpose: In the interest of intergovernmental coordination and strategic provincial planning, the Climate Change Bill, 2021 proposes that a provincial Premier's intergovernmental forum also serve as a Provincial Forum on Climate Change to "...coordinate climate change response actions in the relevant province" (Section 8(a) of the Bill). In the Western Cape, the Premier's Coordinating Forum can fulfil the requirements.

Accountability: The Provincial Forum on Climate Change must provide a report to its national equivalent, the Presidential Coordinating Council.

Technical Climate Change Working Group

Purpose: To direct and align policy and action within the Western Cape Government structure at a technical, implementation level. The Technical Climate Change Working Group will consist of Senior representatives from all Western Cape Government Departments.

Accountability: Western Cape Government's Climate Change Directorate will be the Secretariat, and the Working Group reports to the Provincial Forum on Climate Change.

Municipal Forums on Climate Change

Purpose: Municipalities, especially, play a vital role in addressing the country's social, economic and environmental needs. Local government is tasked with the provision of services in a sustainable and equitable manner which includes climate change resilience, the facilitation of socio and economic development and the promotion of a safe and healthy environment for all. Climate change and climate variability already have a direct impact on the ability of municipalities to meet these objectives. The Climate Change Bill, 2021 thus proposes that intergovernmental forums at district level (District and Metropolitan Municipalities) also serve as a Municipal Forums on Climate Change to "...coordinate climate change response actions for those activities within its operational control of the relevant municipality" (Section 9(a) of the Bill).

In the Western Cape the District Coordination Forums will serve this purpose.

Accountability: The Municipal Forums will report to the Provincial Forum on Climate Change.

Climate Change Knowledge Exchange

Purpose: This forum will focus on priority responses that fall outside the formal government structures and need coordinated responses in order to be taken forward. This forum can also be used to coordinate funding applications and multi-sector programmes and projects that respond to climate change in the Western Cape. It will be a space for technical knowledge exchange amongst implementors, researchers and involved organisations in the climate change space.

Regular meetings taking place under this platform will involve nominated representatives from all spheres of government, the private sector, civil society, youth, academia and other key stakeholders.

Accountability: Western Cape Government's Climate Change Directorate will be the Secretariat, with reporting to the Technical Climate Change Working Group and Provincial Forum on Climate Change.

Climate Assembly

Purpose: An annual Climate Assembly will initially be convened as an 'event' but build towards a more sustained platform for civil society, private sector, academia, women, youth groups and all other stakeholders to engage on climate change response actions in the Western Cape. It will be an opportunity for open dialogue on the progress of climate change implementation amongst all stakeholders, and to share information about strategies and projects at all levels. It may shape an action plan for the Western Cape in how it continues to respond to climate change, be informed about strategies and projects, and assist in shaping government policy and action related to climate change.

Accountability: An external third-party organisation will support the convening of a neutral space for dialogue, with support from the Climate Change Directorate.

The discussions at the Assembly will be documented and made available to the public and used to inform discussions taking place in Climate Change Knowledge Exchange meetings.

MONITORING, REPORTING AND EVALUATION

It is important to ensure that the implementation of the Strategy is in accordance with the stated objectives and targets. Monitoring progress in implementation is crucial within a framework of reflexive adjustment – the need to reassess and adjust as conditions or parameters change. We have recently seen how a pandemic can cause major disruption, and hence should be prepared to face further future shocks. A good understanding of our climate change response trajectories and progress will allow for the necessary ‘course adjustments’ along the way, as informed by monitoring and evaluation.

Monitoring and evaluation cycles around climate change responses will thus be conducted on annual, biennial, as well as 5 yearly periods, where the implementation plan will identify key indicators to track and evaluate progress on actual climate impacts as opposed to a superficial count of intervention projects. The monitoring and evaluation framework will be developed after finalising the strategy.

The compilation of the **WCCCRS Biennial Monitoring and Evaluation Reports** will act to consolidate information about how the Western Cape is doing in respect of the critical actions outlined in the Strategy. The reporting will inform programmatic adjustment where implementation lags, and a regular reconsideration of the Climate Change Response Strategy to compensate for unanticipated contextual changes. In many cases, programmatic reporting takes place within existing programmes or projects, and it is not necessary for the WCCCRS to duplicate the tracking.

In anticipation of the requirements of the Climate Change Act, the Climate Change Implementation Plan will be integrated into the Provincial **Environmental Implementation Plan** compiled by the Department of Environmental Affairs and Development Planning. This regulatory tool creates a framework for aligning the objectives and outcomes of policies and programmes in the province and matches them to priority indicators that can be tracked over time, ensuring that performance tracking is aligned and not duplicated.

Reporting within a national context is a further consideration, as there is a need to consolidate knowledge and data on a national scale to facilitate planning and policy. Accordingly, the WCCCRS progress indicators will align with national ones. This will prevent the creation of elaborate reporting systems that detract from implementation action or add little to the understanding of climate change response initiatives and their impact. This detail will be elaborated on within the WCCCRS Implementation Plan.

The Western Cape Government is currently finalising a **GHG inventory** for the Western Cape, covering the energy (including transport), IPP), waste and AFOLU sectors. This is a high-level assessment of GHG emissions in the Western Cape and will allow us to track the emission profile across sectors. The report and inventory will be updated regularly in alignment with national reporting requirement. Where there are sectors or activities that are required to report on GHG emissions to national government, particularly under the NEM: Air Quality Act as well as the Carbon Tax Act, the information is submitted directly by industry to the National Emissions Inventory System (NAEIS).

Furthermore, due to the focus on **Human rights and gender mainstreaming** within the Western Cape Government, an additional gender impact lens will be applied for all projects and programmes. This means that all vulnerable groups including women, children, the elderly and disabled should be considered. All work aligning with the Climate Change Response Strategy must be evaluated against the following framework:

1. How have all vulnerable groups been considered in the work?
2. Have the implications for different genders, age categories and universal accessibility been considered?
3. Were representatives of vulnerable groups consulted and to what level were women included in the decision making?
4. Who will benefit and will vulnerable groups have equal opportunity to benefits?
5. Are there opportunities to empower women so that they are better equipped/knowledgeable to participate in decision making?

LET'S GET STARTED

“It takes 25 years – a generation – to transform an industrial sector and all the value chains. To be ready in 2050, decisions and actions need to be taken in the next five years.”

(from: The European Green Deal⁵⁰)

Whilst climate change is being mainstreamed across sectors with varying degrees of success, the current implementation of climate change response is still limited. In some respects, we are lagging behind our global peers in terms of our ability to keep pace with changes. Importantly, the change within government requires deep-seated fast-tracking.

The Western Cape (and South Africa) needs a bold and ambitious Climate Change Response Strategy, that takes us toward net zero carbon emissions by 2050, with transformative risk reduction and adaptation actions in place; otherwise all other development decisions and pathways currently being planned for and implemented are likely to be undermined.

“The climate transition is something that affects every South African and we all need to be part of its design and implementation...We have to act now if we are to achieve sustainable and inclusive growth, secure the health and well-being of our people and safeguard the future of our planet.”

(‘From the desk of the President’, 11 October 2021⁵¹)

Given the current economic situation in South Africa, we need to collectively direct spending and operational models towards opportunities to rise above the current low growth state. It is therefore prudent to heed the advice of local and international think tanks contending that, without a doubt, only climate resilient development and investment are likely to bring sustainable gains over time⁵². We should avoid the ‘sunk cost’ fallacy – i.e. even if we had previously invested in feasibility studies, projects or technologies which bring minimal carbon gains it is critical to re-evaluate such spend based on the rapidly changing *status quo*. This will allow rapid adjustment to lower carbon emissions and increasingly cost-efficient technologies stimulated by the climate change global requirements.

It is important to recognise that the Western Cape has already instituted projects or programmes that respond to, or align with, the objectives of this climate change strategy. To avoid losing any momentum whilst more detailed sector responses are

⁵⁰ The European Green Deal - https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf

⁵¹ <https://www.gov.za/blog/desk-president-88>

⁵² OECD: https://www.oecd-ilibrary.org/environment/the-economic-consequences-of-climate-change_9789264235410-en; IMF: <https://www.imf.org/en/Topics/climate-change/climate-and-the-economy>; TIPS: <https://www.tips.org.za/research-archive/sustainable-growth>; EU: https://www.consilium.europa.eu/media/39480/ttr_special-issue_climate-change_2019.pdf

defined, the programmes identified below should be enhanced with the necessary vigour.

Some existing climate change response aligned programmes for the Western Cape Government are:

1. Increase the share of renewable energy and decentralised energy systems in the overall energy mix, and improving our energy security, through the **Western Cape Municipal Energy Resilience Initiative**
2. Improve the province's water security through transversal collaboration on the **Sustainable Water Management Plan**
3. Adapt the agricultural sector to the changing climate and global situation, in accordance with the **SmartAgri Plan**
4. Kick-start the transition to electric mobility and subsequent decarbonisation of transport through a **government-led Electric Vehicle fleet transition**
5. Complete the Western Cape's greenhouse gas emissions inventory and detailing a **2050 Greenhouse Gas Emissions Mitigation Pathway**
6. Implementation of the provincial **Air Quality Management Plan** and Integrated **Waste Management Plan** in respect of GHG emissions reduction
7. Identify climate change hazards and vulnerabilities as part of **Risk Assessments in Disaster Management Plan(s)**
8. Advancing the ecological resilience outcomes of the **Provincial Biodiversity Strategy and Action Plan**, through implementation of the **Ecological Infrastructure Investment Framework, Biodiversity Spatial Plan and Protected Area Expansion Strategy** to secure investment into natural capital and the restoration of our land and oceans
9. Utilize the **Sustainable Public Procurement Programme and public employment programmes** to create sustainable jobs and foster divestment from fossil fuels, whilst ensuring women and youth's economic empowerment and livelihood diversification
10. Ensuring the integration of **climate change considerations in all development and spatial planning processes** including the implementation of **coastal and estuary management instruments**
11. Continued improvement in the resource efficiency of, and renewable energy uptake in the Provincial building portfolio, for example through the **Global Green and Healthy Hospitals** programme and **Building Modernisation Programme**

The items in the response baskets identified under the four Guiding Objectives represent the balance of actions that are required across all sectors. More detailed of the full suite of response actions, highlighting timelines, quantified targets and specific responsibilities for implementation will be captured in a full implementation plan which will be published in the wake of the adoption of this strategy. Note that successful implementation of a broad climate change response strategy requires a private and public sector commitment to complement the initiatives from the Western Cape Government.

Given the potential for the cascading effects of climate change to erode any gains in social and economic development, our highest priority is to ensure that both the foundational and interim development programmes in the province, and especially the focus on Jobs, Safety and Well-being, are climate resilient. In other words, our

plans, programmes and actions across all sectors must be underpinned by the already changing climate and the way it will manifest in people's lives and both the local and global economy – the leadership of the Western Cape Government will drive delivery on the Climate Action Pathway targets. These targets should also guide the actions and priorities on non-Western Cape Government stakeholders in taking this work forward in the Western Cape as a whole.

An accelerated response is required.

Just as a 1.5°C world is far more habitable than one at 2°C, so will expedited action be more effective and less costly than delayed action. We also risk missing the opportunity for successful adaptation, as there are finite limits to adaptation⁵³. This Strategy review provides a unique moment within which to evaluate what has been implemented to date, versus what needs to be in place to meet our global obligations for mitigation, and thus our collective ability as humans to cope with climate change impacts. Given the current economic situation in South Africa, we also need to identify opportunities to rise above the current low growth state and devastation to certain sectors, to generate revenue so desperately required for socio-economic development. Investing in climate change response seeks to minimise the impacts on the most vulnerable in our society and emphasising a more just and inclusive economic functioning. Taking a cue from international leadership, it is evident that only climate resilient and low-carbon development and investments are likely to bring sustainable gains over time.

Progress in addressing a range of seemingly intractable socio-economic challenges, such as COVID-19 in the Western Cape⁵⁴ proves that we can re-imagine our economy and society in any way required, and that this government has the capacity to do what is necessary to benefit all citizens but especially the most vulnerable. We cannot claim that the changes required to respond to climate change are too challenging, too outside of the norm or too big to undertake. There really are no other options, but to tackle the emergency head-on.

We need science driven, policy-led political and private sector leadership to take bold, societal changing, decisive action to ensure nobody is left behind. In this way the Western Cape will realise its vision as a resilient and low-carbon province in Africa.

⁵³ IPCC, 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (<https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii/>)

⁵⁴ Refer to the chapter on Socio-Economic Development in the 2020 Provincial Economic Review and Outlook: <https://www.westerncape.gov.za/provincial-treasury/files/atoms/files/2020%20PERO%20Publication.pdf>

ANNEXURES

ABBREVIATIONS AND ACRONYMS

AFOLU	Agriculture, Forestry and Other Land Use
AR4	Fourth Assessment Report
AR5	Fifth Assessment Report
AR6	Sixth Assessment Report
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
COP26	26th Conference of the Parties
COVID-19	Coronavirus disease 2019
CSAG	Climate System Analysis Group
DEA&DP	Department of Environmental Affairs and Development Planning
GCM	Global Circulation Model
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Products and Product Use
Mt	megaton
NAEIS	National Emissions Inventory System
NDC	Nationally Determined Contribution
SLCF	Short-lived climate forcers
SmartAgri	Western Cape Climate Change Response Framework and Implementation Plan for the Agricultural Sector
SPEI	Standardised Precipitation Evaporation Index
SPI	Standardised Precipitation Index
SSP	Shared Socio-economic Pathway
TNC	Third National Communication
UNFCCC	United Nations Framework Convention on Climate Change
WCCCRS	Western Cape Climate Change Response Strategy

GLOSSARY OF TERMS⁵⁵

Adaptation (in the context of climate change)	This describes the process of adjustment of human systems to both current and anticipated effects of a changing climate to moderate harm or enable exploitation of beneficial opportunities.
Anthropogenic	Resulting from or produced by human activities
Blue economy	This is an economic term relating to the use of ocean resources for socio-economic growth. ⁵⁶
Carbon footprint	Measure of the exclusive total amount of emissions of carbon dioxide (CO ₂) that is directly and indirectly caused by an activity or is accumulated over the life stages of a product
Circular economy	A circular economy involves the gradual decoupling of economic activity from the consumption of finite resources and designing waste out of the system. It is based on three principles: design out waste; keep products and materials in use; regenerate natural systems. ⁵⁷
Climate Assembly	An engagement platform that facilitates public participation and contribution in regard to the formulation of climate related policy, typically formed by randomly selected citizens ⁵⁸ .
Climate change	<p>A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use.</p> <p>(In the context of this document intended to specifically refer to out of the ordinary changes induced by human activities since the industrial revolution)</p>

⁵⁵ Unless otherwise indicated, taken from: IPCC, 2022. Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change: Annex II (https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_Annex-II.pdf)

IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Portner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Pean, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)].

⁵⁶ <https://www.worldbank.org/en/news/infographic/2017/06/06/blue-economy>

⁵⁷ <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

⁵⁸ https://en.wikipedia.org/wiki/Citizens%27_assembly

Climate decade	Refers to the period 2020-2030 during which urgent action is needed to deliver on the Paris Agreement and halve global emissions by 2030. This action is required to avoid catastrophic impacts of climate change by 2100 and achieve net zero emissions by 2050 to keep the global temperature increase below 2°C. ⁵⁹
Climate emergency	The idea that global warming and climate change have progressed to a point where, unless drastic ('emergency') action is taken, globally disastrous consequences will result. ⁶⁰
Climate resilient development	Refers to the process of implementing greenhouse gas mitigation and adaptation measures to support sustainable development for all.
Coastal Management Line	A risk-based planning tool for designating development-compatible coastal land. ⁶¹
Ecological Infrastructure	The naturally functioning ecosystems that deliver valuable services to people, such as water and climate regulation, soil formation and disaster risk reduction. It is the nature-based equivalent of built or hard infrastructure, and can be just as important for providing services and underpinning socio-economic development. Ecological infrastructure does this by providing cost effective, long-term solutions to service delivery that can supplement, and sometimes-even substitute, built infrastructure solutions. Ecological infrastructure includes healthy mountain catchments, rivers, wetlands, coastal dunes, and nodes and corridors of natural habitat, which together form a network of interconnected structural elements in the landscape. ⁶²
Ecosystem-based adaptation	The use of ecosystem management activities to increase the resilience and reduce the vulnerability of people and ecosystems to climate change.
Emissions pathway	Modelled trajectories of global anthropogenic emissions over the 21st century.
Fair share	What could be considered an equitable national contribution to the global effort in reducing greenhouse gas emissions based on a country's historic and current emissions, and its capacity for emissions reductions. ⁶³

⁵⁹ <https://globescan.com/report-2020-climate-survey-evaluating-progress/>

⁶⁰ https://en.wikipedia.org/wiki/Climate_emergency_declaration

⁶¹ <https://www.westerncape.gov.za/eoadp/about-us/meet-chief-directorates/environmental-sustainability/biodiversity-and-coastal-management>

⁶² South African National Biodiversity Institute (SANBI)

⁶³ <https://climateactiontracker.org/methodology/cat-rating-methodology/fair-share/>

Global warming	Global warming refers to the increase in global surface temperature relative to a baseline reference period, averaging over a period sufficient to remove interannual variations (e.g., 20 or 30 years).
Green Economy	This is an economic term used to define a low-carbon, resource efficient and socially inclusive economy that is aimed at reducing environmental risks and achieving sustainable development. ⁶⁴
Green New Deal	The Green New Deal is a term that is used to describe various sets of policies aiming to make systematic change for a transition to a greener economy that can address the problem of climate change. It entails governments allocating funding to green sectors aimed at economic recovery, poverty eradication, and reduced carbon emissions and ecosystem degradation. ⁶⁵
Greenhouse gas (also 'carbon emissions')	Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of radiation emitted by the Earth's ocean and land surface, by the atmosphere itself, and by clouds. This property causes the greenhouse effect. Water vapor (H ₂ O), carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O) and ozone (O ₃) are the primary GHGs in the Earth's atmosphere. Human-made GHGs include sulphur hexafluoride (SF ₆), hydrofluorocarbons (HFCs), chlorofluorocarbons (CFCs) and perfluorocarbons (PFCs); several of these are also O ₃ -depleting (and are regulated under the Montreal Protocol).
Greenhouse gas inventory	This is a catalogue of all greenhouse gas emissions produced from different sectors/activities within a geographic region. They form a conceptual basis in which to understand emission trends, develop action plans, set reduction targets/goals and track progress at reducing emissions. ⁶⁶
Just Transition	A set of principles, processes and practices that aim to ensure that no people, workers, places, sectors, countries or regions are left behind in the transition from a high-carbon to a low-carbon economy. It stresses the need for targeted and proactive measures from governments, agencies, and authorities to ensure that any negative social, environmental or economic impacts of economy-wide

⁶⁴ <https://www.unenvironment.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy>

⁶⁵ <https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=670&menu=1515>

⁶⁶ <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/reporting-requirements>

	transitions are minimized, whilst benefits are maximized for those disproportionately affected.
Maladaptation	Actions that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas (GHG) emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future. Most often, maladaptation is an unintended consequence.
Mitigation (in the context of climate change)	This entails human interventions that can be in the form of technology, processes or practices that act to reduce emissions or enhance sinks of greenhouse gases.
Natural Capital	Refers to the world's stocks of natural assets. Examples of these assets include soil, water, air and all living things ⁶⁷ . These assets form the basis from which ecosystem services (such as food provision and climate regulation) are derived to enable human life to be possible. From a climate change perspective, investment in natural capital can contribute to developing resilience to negative impacts associated with an altered climate. ⁶⁸
Net Zero (CO ₂ emissions)	Condition in which anthropogenic carbon dioxide (CO ₂) emissions are balanced by anthropogenic CO ₂ removals over a specified period.
Non-motorised transport (NMT)	This term refers to active and human powered transport, such as walking and variants of small-wheeled transport systems like bicycles. This type of transport is important for a transition to a low-carbon future, where the development of efficient non-motorised transport infrastructure can act to complement and enhance existing public transport systems by providing secure access to them. This in effect can encourage a shift away from the over reliance on private vehicle transport which is associated traffic congestion and high carbon emissions. ⁶⁹
Resilience	The capacity of interconnected social, economic and ecological systems to cope with a hazardous event, trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure.
Shared Socioeconomic Pathway	The designation 'SSP' refers to 'Shared Socioeconomic Pathway'. These illustrative scenarios were used for the scientific reporting of the Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report (AR6). Each scenario describes a unique future combination of

⁶⁷ <https://naturalcapitalforum.com/about/>

⁶⁸ <https://www.worldbank.org/en/topic/natural-capital#1>

⁶⁹ https://www.dffe.gov.za/projectsprogrammes/nonmotorizedtransport_southafrica

	emissions or concentrations of greenhouse gases, aerosols, ozone depleting substances, and land use. The SSP5-8.5 scenario can be seen as the 'worst case' scenario with little to no global mitigation of GHG emissions, and the SSP1-2.6 scenario as a 'positive outlook' scenario with good global co-ordination of mitigation efforts. The latest global emissions data shows that we are following an 'intermediate' scenario, SSP2-4.5, with some stabilisation of greenhouse gas emissions.
Short lived climate forcers	Short-lived climate forcers (SLCFs) A set of chemically reactive compounds with short (relative to CO ₂) atmospheric lifetimes (from hours to decades) but characterised by different physiochemical properties and environmental effects. Their emission or formation has a significant effect on radiative forcing over a period determined by their respective atmospheric lifetimes. Changes in their emissions can also induce long-term climate effects via, in particular, their interactions with some biogeochemical cycles. SLCFs are classified as direct or indirect, with direct SLCFs exerting climate effects through their radiative forcing and indirect SLCFs being the precursors of other direct climate forcers. Direct SLCFs include methane (CH ₄), ozone (O ₃), primary aerosols and some halogenated species. Indirect SLCFs are precursors of ozone or secondary aerosols. SLCFs can be cooling or warming through interactions with radiation and clouds. They are also referred to as near-term climate forcers (NTCFs). Many SLCFs are also air pollutants. A subset of exclusively warming SLCFs is also referred to as short-lived climate pollutants (SLCPs), including methane, ozone, and black carbon.
Vulnerability	The propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

WHAT SCIENCE SAYS ABOUT CLIMATE CHANGE IN THE WESTERN CAPE

Climate change projections information sources

An understanding of future climate conditions is obtained from global climate simulations known as Global Circulation Models (GCMs). These models calculate how atmospheric forces and conditions change and interact around the world. This means that they can project how the changes evolve into the future under certain input conditions – with a primary determinant being the amount of greenhouse gases that are added to the atmosphere.

The 2008 WCCCRS was developed during a period when the latest climate change trends and projections at a global and continental scale were available through the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) published in 2007⁷⁰. In 2013/2014, the Fifth Assessment Report (AR5) was released⁷¹. It considered new evidence of climate change based on many independent scientific analyses from observations of the climate system, paleoclimate archives, theoretical studies of climate processes and simulations using climate models. AR5 informed the 2014 revision of the WCCCRS. The constituent reports of the Sixth Assessment Report (AR6) are currently in a staggered release phase⁷². The first report, documenting global physical climate science, was released on 6 August 2021, and the second, dealing with Impacts, Adaptation and Vulnerability, was released on 27 February 2022. AR6 products will be used to inform policy and implementation decisions going forward. They are supplemented with the IPCC's *Global Warming of 1.5°C*⁷³ report.

The most recent set of projections specifically for South Africa is presented in Chapter 3 of South Africa's Third National Communication (TNC) to the United Nations Framework Convention on Climate Change (UNFCCC)⁷⁴. The TNC is the main source of information related to climate change observations and projections, but additional reference is found in the national study on climate change trends and projections that formed part of the Long Term Adaptation Scenarios project⁷⁵, and climate change projections for Western Cape municipal climate change response plans.

Western Cape-specific assessments of GCM modelling results applicable to the Western Southern African region have been produced for the Western Cape Government by the Climate System Analysis Group (CSAG) and African Climate Development Initiative of the University of Cape Town in recent years. A 2017 Report on the updated Risk and Vulnerability component of the 2008 Climate Change Response Strategy⁷⁶ formed part of a broader review of provincial climate change response strategies and action plans, whereas more in-depth assessments informed strategies included in the SmartAgri plan⁷⁷. The most recent product, an update of the

⁷⁰ <https://www.ipcc.ch/reports/?rp=ar4>

⁷¹ <https://www.ipcc.ch/reports/?rp=ar5>

⁷² <https://www.ipcc.ch/assessment-report/ar6/>

⁷³ <https://www.ipcc.ch/sr15/>

⁷⁴ <https://unfccc.int/documents/181851>

⁷⁵ https://www.environment.gov.za/sites/default/files/docs/climate_trends_bookV3.pdf

⁷⁶ Available from the Western Cape Government Climate Change Directorate

⁷⁷ <https://www.greenagri.org.za/smartagri-2/about/>

2016 Status Quo assessment, is currently in a finalisation phase and will be released to the public soon. The findings of this assessment, and its predecessors, are incorporated in the information below.

An additional reference that may be consulted is high resolution downscaled climate change projections produced by the CSIR under the auspices of the Green Book project (www.greenbook.co.za). The projections should, however, be used with circumspect, as lower resolution (e.g. regional) model outputs are expected to have a higher level of confidence.

Observed and projected changes in the climate of the Western Cape

The Western Cape is characterized by a very diverse climate due to the proximity to the ocean and extensive mountain ranges and altitude variations. The significant north-south and east-west mountain ranges produce stark rainfall climate gradients and local rainfall dynamics. The climatic gradients across the province (east-west and coastal-inland), with resulting high diversity of natural resource availability and productive potential (both for agricultural and natural systems) are a critical consideration for the assessment of climate change risks, impacts and vulnerabilities. The province also experiences regular weather extremes and disasters including floods, droughts, hail, storms, fire, heat waves and coastal storm surges.

The Western Cape as a whole has experienced significant increases in temperature across all zones and all seasons over the past century with more rapid warming over the past 30 years. Records show that temperatures have been rising at about 0.1°C per decade throughout the last 100 years. Associated increases in extreme maximum temperature events have occurred, along with a decrease in cold nights. The role of climate change in contributing to increasingly frequent and intense droughts has also been confirmed.

Below is a list of findings from an assimilation of climate change projections from 28 global climate models compiled by CSAG for the Department of Agriculture's SmartAgri plan update in 2022⁷⁸.

The projections of future climate indicate that mean annual temperatures will continue to increase, and that the rising temperatures will drive a concomitant increase in evapotranspiration. Combined with a suggestion of decreasing rainfall (although this trend is an uncertain projection at this point), the province can expect a steady decrease in the overall availability of moisture, resulting in a doubling of the likelihood of droughts in any given decade. Maximum temperatures will increase, more so in autumn and spring than winter and summer. With a rise in minimum temperatures will come a decrease in frost days and positive chill units, which has important implications for agricultural production.

Temperature indices

- Projected increases in mean temperature averaged over the whole province are of the order of 1°C to 1.8°C by 2060 compared to the recent past (1981 – 2010).

⁷⁸ The update to the Status Quo Assessment is currently being finalized for publication. The Department of Agriculture can be contacted for more detail.

- Mean annual average daily temperature projections for some SmartAgri Zones, most notably those further from the coast are even higher with some models projecting increases as high as 2°C.
- Projected changes in mean daily minimum temperatures (night-time temperature) are also strongly positive and in some inland zones (e.g. Nelspoort) are even higher than increases in maximum temperatures, reaching as high as 2.7°C.
- Increases in temperature also result in an increase in the number of hot days. The projected increase in the number of days exceeding 30°C ranges from as few as 5 more days/year through to as many as 30 more days/year for inland Zones (e.g. Nelspoort).

Rainfall indices

- Projected changes in rainfall related indices exhibit higher uncertainty, with some models projecting only minimal reductions in rainfall across the province, and others projecting as much as 20% reduction in annual rainfall averaged over the province.
- Most SmartAgri zones show projections of decreasing rainfall in summer (December to February) though in many cases these changes are small enough that they do not pass the statistical significance test. This does not mean that drying is not likely, but rather that natural variability (variations from year to year) is high and there remains some probability that the projected changes are the result of natural variability rather than climate change.
- However, rainfall changes in some SmartAgri zones and some seasons are statistically significant and could be as large as a 40% reduction (e.g. Nelspoort in Summer)
- *The Nelspoort and adjacent Koup zones* exhibit the highest uncertainty in projected rainfall changes across all seasons, most likely as a result of their location between the mid-latitude winter rainfall dynamics and the sub-tropical summer rainfall dynamics. Rainfall in these zones will be very sensitive to how a model represents the transition between these two zones. Some models project increases in summer rainfall in these zones, while other project very strong decreases. In winter these zones are shown fairly consistent drying projections, again with statistically significant strong drying projected by some models.
- Projected changes in the number of rainy days (more than 1mm rainfall) also involves fairly high uncertainty across both summer and autumn (March to May), however the reduction in wet days does not appear to be as pronounced as the reduction in rainfall with most zones showing statistically insignificant changes. These suggests that rainfall reductions are mostly associated with less rainfall per event rather than less events.
- Similarly, projected changes in consecutive dry days, while on the whole indicating an increase in dry spell lengths, have weak statistical significance in most cases. However, some increases in dry spell duration are significant and

as large as 20 days in summer. It must be noted that in many cases the baseline maximum dry spell duration in these areas is large.

Evaporation and drought indices

- Projected changes in Potential Evapotranspiration are consistently positive across all zones and across all models in all ensemble datasets as they are largely driven by consistent increases in temperature. These projections align well with analysed Potential Evapotranspiration based on observations.
- Projected changes in frequency of drought events as determined by Standardised Precipitation Index (SPI) and Standardised Precipitation Evaporation Index (SPEI) threshold exceedance (SPI or SPEI < -1) indicate consistent increases in frequency of drought events towards the end of the century with more rapid increases for SPEI based drought due to the inclusion of temperature driven evaporation.
- For many of the clustered zones a 1 in 10 drought event under current conditions is projected to shift towards a 1 in 2 (5 events per decade) by mid-century when the effect of increasing temperature on evaporation are considered.

Table 1: Observed and Projected Climate Change Impacts

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
Temperature	<p>A general trend of rising temperatures (about 0.1°C per decade), including both minimum and maximum temperatures.</p> <p>Increasing temperatures are resulting in a trend in increased evapotranspiration (this in particular can drive a shift in state to droughts, and severe impacts on agriculture).</p>	<p>Over South Africa as well as the Western Cape, the strongest warming rate is projected for the interior and closer to the mountains, and the weakest warming rate is projected along the coastline.</p> <p>Rates of warming are likely to be higher in spring and autumn.</p>	<p>Increased temperatures and increased evapotranspiration result in dry soils and vegetation which becomes more fire-prone.</p> <p>The number and intensity of fires seem to be increasing. Disaster funds for fires will need to increase as well, but more importantly proactive protection of ecosystems and water is the required long-term response.</p> <p>There has been a decrease in the number of very cold days which creates the cold (or chill) units required for deciduous fruit cultivars to produce fruit.</p>
Precipitation (Rain, snow)	<p>A reduction in rain days in autumn and summer especially on the Southern Coast.</p> <p>Evidence of a trend in reduced total precipitation per rain event.</p> <p>Anecdotal information of a reduction of winter snow in Karoo – may result in decreased groundwater recharge. Current status unknown.</p>	<p>Projected changes in rainfall totals and other rainfall-related statistics generated by global climate models are more uncertain than temperature change projections. Rainfall variability is very likely to increase, but the direction and amount of rainfall change cannot yet be projected with confidence. Preliminary indications show rainfall declining throughout the province by about 5% by 2060. For the winter rainfall areas, this is due in part to the poleward shift of cold fronts associated with winter weather systems.</p>	<p>Drought awareness has to increase, as even a stable total rainfall pattern will result in lower water availability due to the rising overall temperatures.</p> <p>Cape Town is already responding to this trend with increased flood preparedness plans in winter, as well as increased standard requirements for storm water flows in infrastructure.</p>
Floods / Droughts	<p>Numerous flood and drought events have occurred in the Western Cape in the past decades with increasing frequency. It has now been determined that at least in part, the 2015-2017 drought is attributable to a changing climate. However, the</p>	<p>Projections of potential evapotranspiration, the Standardised Precipitation Index (SPI) and the Standardised Precipitation and Evaporation Index (SEPI) are all clearly trending upwards (i.e. drying), linked to the increasing temperatures.</p> <p>The combined effects of increased temperature and evaporation mean that for most of the</p>	<p>Moisture availability at ground level will reduce over time, translating into more frequent hydrological droughts. Water dependent activities, especially agriculture, will have to find ways to become more water efficient and weather</p>

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
	natural variability is too high to discern a long-term historical trend.	province, a 1 in 10 drought event under current conditions is projected to shift towards a 1 in 2 (5 events per decade) by mid-century.	the longer or more frequent drought events.
Wind		There remains uncertainty about wind speeds.	Increased wind speeds will impact on tourism, e.g. Table Mountain cable car operations, Robben island ferry operations and beach usability, as well as on commercial operations, such as construction sites and port activities. Increasing wind speeds will have an influence on wave height and power.
Sea level rise	Sea level has been rising at the same rate as global trends. Already, the rate of sea-level rise along the Western Cape coast has been measured over the last five decades to be in the order of 20 cm/century along the west coast and 15 cm/century along the south coast with the difference emanating from differential geological conditions and temperatures.	The IPCC AR6 report indicates that by 2050 sea levels will 25cm higher. It refrains from reporting conclusive projections from 2050 onwards due to uncertainty over the global GHG mitigation efforts. It also confirms that anthropogenic global warming and sea-level rise will continue for centuries due to the timescales associated with climate processes and feedbacks, even if greenhouse gas concentrations are stabilised or reduced. Alarmingly, climate systems are getting closer to 'tipping points' that can result in sudden, irreversible events such as the melting of the Greenland or Antarctic ice sheets. Such an event will massively add to sea level rise and render all current response planning obsolete.	The irreversibility of sea level rise is confirmed, and our coastal planning has to respond accordingly. Both existing and planned development will need to respect projections of erosion and wave overtopping, and in some cases plan for a process of pro-actively moving infrastructure out of the risk zone.
Storm Surges (big storm events)	Big storm events have caused infrastructure damage along the Western Cape coastline. This is in part related to sea level rise.	Modelling does not offer a definitive picture of the future evolution of coastal storms. Should wind speeds increase, then the ferocity of wave build-up and impact will increase commensurately. However, a poleward movement of weather systems will reduce the effect of frontal systems during the winter season.	Coastal municipalities potentially have a big role to play in managing coastal development. Notably, insurance companies are starting to withdraw their cover from some vulnerable coastal areas.

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
Ocean temperature	The Agulhas current has warmed by 1.5°C since 1980. The impact of global warming and sea-level rise has already brought changes in the distributional range of fish and other marine species. Climate change is also responsible for shifts in the distribution of the West Coast rock lobster. However, the full understanding of these changes is complex and cannot necessarily all be attributed to a changing climate ⁷⁹ .	Warming of the oceans will continue for several centuries, irrespective of global mitigation of GHG emissions. There isn't certainty about the effect on ocean temperatures though, although sea surface temperatures can be expected to increase.	Impacts of shifting marine resources have implications for social and economic fabric of coastal communities.
Ocean Acidification⁸⁰	Ocean acidification would have severe impacts on most ocean life. Currently the ocean has already acidified by 0.1 pH points as a global average (this varies from region to region).		Current impacts not well described.
Fire	Observed increased fire incidences ⁸¹ and potential increase in extent and severity of fires. Fires tend to occur in record breaking hot temperatures and low humidity.	There will be an increase in the number of extremely hot days and the duration of heatwave events in future. The effect will be more pronounced the further inland one goes.	The conditions conducive to wildfires starting and spreading beyond control will become more common. This will require more resources to respond to and contain wildfires, especially in inland areas where resources are generally thinly spread already. A major concern is areas adjacent to mountain ranges, that will be exposed to wildfires descending. Infrastructure, agriculture, wildlife and people are at risk.
Hail	There is anecdotal evidence that more hailstorms are occurring, and occurring in new areas of the Western Cape,	There aren't definitive projections available regarding the evolution of hail-producing storms.	The increased likelihood of hailstorms is not well understood, but damage to agricultural crops are potentially significant.

⁷⁹ SAEON. 2011 Observations in Environmental Change in South Africa.

⁸⁰ As the ocean absorbs CO₂ its PH changes.

⁸¹ <http://www.iol.co.za/news/south-africa/western-cape/cape-fire-insurance-firms-brace-for-claims-1.1827557#.VfnA8RGeDGc>

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
	causing economic losses to agriculture (SmartAgri Status Quo Report ⁸²).		

⁸² Western Cape Climate Change Response Framework and Implementation Plan for the Agricultural Sector, Status Quo Report: <https://www.greenagri.org.za/assets/documents-/SmartAgri/Briefs-/Smart-Agri-Status-Quo-Review-2016.pdf>

P.S. Imagine the Western Cape in 2050

In 2050, they the global humans of the Camissa region, are a connected community working together to maintain their healthy soils, landscapes, oceans, waterways and renewable energy systems in times that are turbulent. Climate change impacted them in many devastating ways, with multiple droughts, heatwaves, coastal erosion, pandemics and emotional trauma in the past three decades. Adversity has redefined value systems. Despite the turbulence everyone has access to natural spaces, healthy food, fresh water, energy, shelter, dignity, education, healthcare, and an income. Everyone is trained in disaster management and survival skills, and community responses are synchronised.

It was because they as teenagers and children compelled the then leaders of the province to take bold action in the 2020s, that they managed to put in place a timely regenerative and circular society/economy supported by a universal income. It was timely as it happened as part of the recovery from the first pandemic, then called COVID-19. And it was timely as it happened in the Climate Decade, in sync with global efforts to keep the global warming within 2°C of pre-industrial times. The science then called for urgent action to arrest temperature increases, as beyond 1.5°C to 2°C our species would face potentially catastrophic hardship and possible extinction. Elections and political decisions in the 2020s were essentially referendums on the survival of the human species and their supporting ecosystems, and so many other species on Earth.

Camissa (then called the Western Cape) was a leading and forward-thinking region, that quickly catalysed a transformative action plan formulated in collaboration with a Citizens Assembly and an Alternative Citizens Climate Change Strategy (known affectionately as the Alt-Strategy). All generations were given rights in decision making, from the youngest to the oldest, with a strong focus on the youngest generations having proportionally higher representation. No generation, class, race, gender, or species was discounted in decision-making.

The bold action taken was unilaterally supported by government, private sector, civil society and academia, with only a few private sector entities showing resistance to their unfortunate but necessary loss in the transformation. There was a clear Just Transition, and workers found new roles, vocations and purpose in a society where no-one was left behind. The organizations incompatible with the envisaged outcome realized they could be the heroes of our civilization by replacing the enrichment of the few, with space for a truly Ubuntu society that provided profits to all through a clean regenerative and circular society/economy.

They, the children of Camissa, born into a world already in peril, are forever indebted to the flattening of the global emissions curve that took place in the 2020s. It was the largest global non-wartime effort ever undertaken that put the needs of the human race as a collective above that of the individual, and that of cultures, nations, corporations, vested interests, or any other outdated divides. Our most humane defining and unique traits of connectedness, collectiveness, communication and collaboration were poured directly into rebuilding how we defined ourselves as a species that took itself to the brink of collapse and succeeded in triumphing in our darkest hour. If the work had taken place a few years later, our ability to thrive and manage conditions on Earth and in the lands of the Camissa region would have been unbearable and most may eventually have had to migrate or face possible death. We do not know the darkness to which we might have found ourselves in 2050, and thankfully we do not need to imagine this scenario. Life in Camissa in 2050 is sweet.

Email: deadp.climatechange@westerncape.gov.za

Tel: +27 21 483 3966

Department of Environmental Affairs and Development Planning

Chief Directorate: Environmental Sustainability

Directorate: Climate Change

www.westerncape.gov.za

Department of Environmental Affairs and Development Planning: General Enquiries

Email: enquiries.eadp@westerncape.gov.za

Tel: +27 21 483 4091 Fax: +27 21 483 3016



**Western Cape
Government**