



Western Cape  
Government

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Department of Environmental Affairs  
and Development Planning

# WESTERN CAPE CLIMATE CHANGE RESPONSE STRATEGY

VISION 2050: A vision for a resilient Western Cape

Draft for public discussion and co-creation

November 2021

## ABOUT THIS STRATEGY

The Western Cape Climate Change Response Strategy: Vision 2050 responds to the urgency of the global climate change response amidst the dramatic global events of 2020. It also incorporates the latest science and 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 critical timelines to 2030, 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 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 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 November 2021 version is a draft which will be shared with the public so it can be further crafted and co-developed to be responsive to regional, local and personal needs. Our hope is that collaborative refinement 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.

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## **Imagine the Western Cape in 2050**

### **(a fictitious scenario of the future)**

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.

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## EXECUTIVE SUMMARY

### CALL TO ACTION

Globally, climate change is being declared an Emergency, with immediate systems change required to achieve significant emissions reductions by 2030 and maintain a habitable planet for all. The Western Cape is already experiencing 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 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** describes a climate future that the Western Cape province will strive towards. It is centred on four Guiding Objectives defining the direction of climate change response action for the region, with corresponding targets and actions. The figure below provides a snapshot structure of the Western Cape Climate Change Response Strategy.

An initial subset of 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 an envisaged 2050 Emissions Pathway exercise. A full implementation plan will follow once the Strategy has been finalised.



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

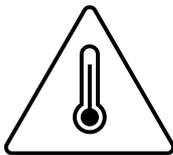
## VISION

**In responding to the unfolding climate emergency, the Western Cape contributes to a prosperous, equitable, and inclusive South African society enabled through a just transition to a low-carbon and climate resilient economy, which is achieved by protecting and investing in our natural capital and rapidly accelerating the green growth trajectory by 2030. The aspiration is to be a net zero emissions province by 2050, resulting in a resilient economy and society that will thrive despite the shocks and stresses posed by climate change.**

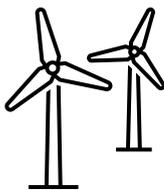
## GUIDING OBJECTIVES

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 inspire innovation and culture amongst its citizens.

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



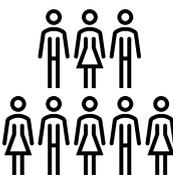
**Effective response to the climate emergency**



**Equitable and inclusive economic and social transition to net zero emissions by 2050**



**Investment in natural capital to reduce climate risks and increase socio-economic resilience**



**Exemplary governance to lead a Just Transition**

## CLIMATE ACTION PATHWAY

A Climate Action Pathway is outlined below, it identifies actions or milestones towards achieving Vision 2050. The milestones will help measure progress towards a climate resilient state, where all people benefit from collective climate responsive governance.

2025: Responding to the	2030	2040	2050
Early warning systems to provide long-term climate warnings and improved extreme weather assessments	Droughts anticipated by climate change projections accommodated in the Western Cape Water Supply System planning	Net zero electricity	Net zero province
No development in a 1:50 yr flood risk zone	International finance support breakthrough achieved	No new heavy-duty internal combustion engine vehicles for public fleets	Zero waste to landfill
2.5% of Government Motor Transport fleet to be zero emissions vehicles	Zero organic waste to landfill	Universal access to basic services	
500MW renewable energy installed in the Western Cape	25% of new vehicle sales to be zero emissions vehicles	Climate change responses mainstreamed in government strategic objectives	
2050 emissions pathway finalized	Freight moved by rail	Minimum ecological standards achieved for water quality in watercourses and waterbodies	
No fossil fuel investment by public funds	No new internal combustion engine public transport vehicles		
Coastal Management Lines for all Districts and Cape Town Metro	50% reduction in methane emissions		
Ecological base flow secured for priority rivers	No new light-duty internal combustion engine vehicles for public fleets		
Employment transition plans for the energy and agriculture sectors	Cape Town and 4 other municipalities with microgrid accommodation capacity		
A fully functional Climate Change institutional structure	All new government buildings to be net zero		
Climate budget tagging in the Western Cape Government	Carbon offset scheme established		
	All wastewater treatment works properly maintained and optimally functional		



2025: Responding to the

2030

2040

2050

30% of land and sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved

Loss of endangered habitats stopped

50% reduction in poverty

No hungry households

Improved representation of women in climate change decision making by 20%, with the ultimate goal being equal representation

Sector strategies for Health, Transport, Agriculture & Economic Development

Systems in place to determine gendered climate impacts

60% of agricultural land farmed with conservation or regenerative agricultural techniques

## IMMEDIATE ACTIONS

Most of the items in the climate change response basket represent broader transitions that are required to curb greenhouse gas emissions and protect populations from the impacts of a warming and more variable climate. The following actions are identified as the most immediate responses to climate change in the Western Cape, and are pivotal to the action pathway development:

1. Increase the share of renewable energy and decentralised energy systems in the overall energy mix, and improving our energy security, through the **Municipal Energy Resilience programme**
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 strategy**
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. Identify climate change hazards as part of **Risk Assessments in Disaster Management Plan(s)**
7. Develop a **Short-Lived Climate Forcers Strategy** for urgent curtailing of emissions such as methane, ozone, refrigerants and aerosols
8. Utilize the **Ecological Infrastructure Investment Framework** as a backbone to investment into natural capital and the restoration of our land and oceans
9. Create a space for citizenry to have their voices heard, in the form of a **Climate Assembly** and ensuring that women have a voice
10. Ensure that there are **effective climate governance structures** that can provide technical support to the Western Cape Government, including the Premier and Treasury
11. Utilize a **sustainable procurement programme and public employment programmes** to create sustainable jobs and divest from fossil fuels, whilst ensuring women's economic empowerment
12. Consider **climate change in all development and spatial planning processes**
13. Develop a roadmap and mechanism for the formulation of **sector-specific climate change response strategies**

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 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.

Immediate implementation of the Western Cape Climate Change Response Strategy 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.

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.

# OUR VISION FOR THE WESTERN CAPE'S CLIMATE CHANGE RESPONSE

## A CALL TO ACTION

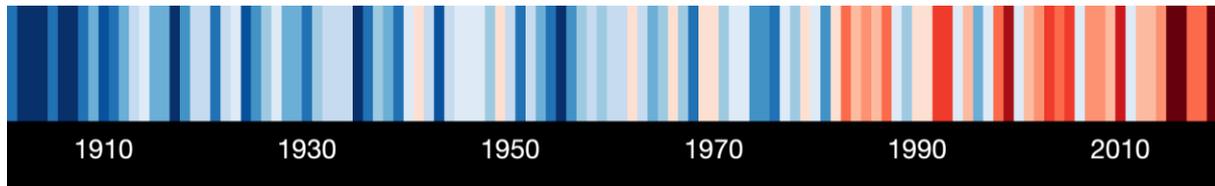


Figure 1. Coloured bars showing the progressively rising temperatures in South Africa since 1901 (<https://showyourstripes.info/>)

**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 (SSP2-4.5<sup>1</sup>), 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 which are subject to increased risk from rising sea levels (at least 60 cm) and more intense storms<sup>2</sup>.

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 unviable, and the temperatures and other associated climate change impacts will affect our attractiveness as a tourist destination. 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. The costs of carbon emissions will impact our global competitiveness if we are unprepared. Infrastructure along the coast will come under increasing threat as sea levels continue to rise. Furthermore, climate change increases health risks which could manifest in premature deaths because of malnutrition, exposure to heat stress and air pollution. It could also result in increased incidences of mental health disorders.

<sup>1</sup> 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. Each scenario describes a unique future combination of 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 still following the 'worst case' scenario.

<sup>2</sup> IPCC Special Report on Global Warming of 1.5°C ([www.ipcc.ch/sr15/](http://www.ipcc.ch/sr15/))

Indications are that changes in temperatures and increasing encroachment into natural ecosystems by humans could release future pandemics<sup>3</sup>.

With inequality being a persistent issue in the development agenda, effects of climate change will cause previously disadvantaged groups, particularly women 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 design<sup>4</sup>.

**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 Agreement<sup>5</sup>. 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 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.

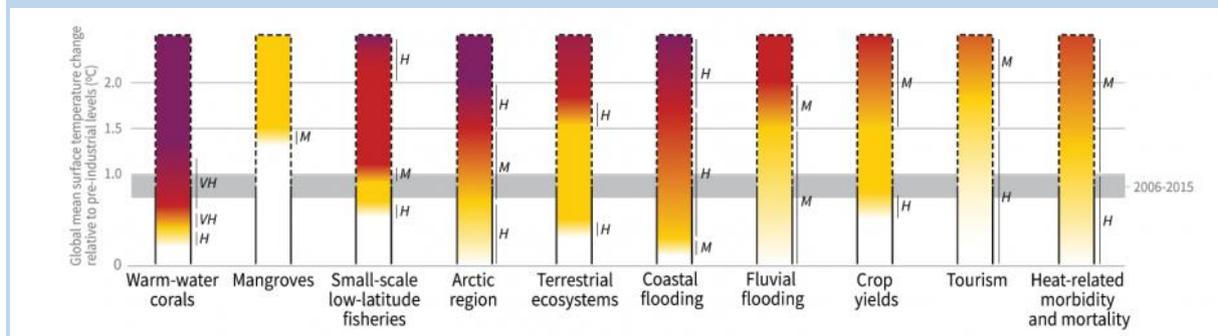
Higher global average temperatures will lead to climate-related impacts such as temperature extremes, drought, declining human health, and so much more. Although limiting global temperature increase to 1.5°C does not mean that these impacts will not happen; it will reduce the magnitude of the impact, 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

<sup>3</sup> 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>

<sup>4</sup> 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>

<sup>5</sup> The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at 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>

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). 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).



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](http://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 2030<sup>6</sup>.

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 insecurity<sup>7</sup>.

Limiting future global temperature increase to 1.5°C as opposed to 2°C could mean<sup>8</sup>:

- Approximately 420 million fewer people exposed to extreme heatwaves
- Reduced exposure to severe drought for 61 million people in urban areas
- 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 decade. Greater ambition is definitely to be strived for and becoming the leading green economic hub of the African continent will certainly advance the

<sup>6</sup> Findings of the IPCC Sixth Assessment Report: Climate Change 2021: The Physical Science Basis <https://www.ipcc.ch/report/sixth-assessment-report-working-group-i/>

<sup>7</sup> 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](https://www.fint.awsassets.panda.org/downloads/backgrounder_africa_at_1_5c.pdf)

<sup>8</sup> 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>

cause<sup>9</sup>. 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 long-term adaptation, and for the inevitable climate related disasters – whether they be in the form of pests, floods, droughts, heat waves, cold snaps, fires, or storms.

**Given the now 9-year timeline (to 2030) to make significant cuts in our GHG emissions – how do we adopt a new approach for responding to a Climate Emergency?**

The impacts we have already endured from the recent drought and other climate events (see Table 5 in the Annexure on climate change science), and now COVID-19<sup>10</sup>, expresses the need for an economic pathway that is climate-proof, ecologically sustainable and resilient to natural disasters (a 'Green New Deal'<sup>11</sup>) 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.

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<sup>9</sup> [https://www.westerncape.gov.za/assets/departments/transport-public-works/Documents/green\\_is\\_smart-4th\\_july\\_2013\\_for\\_web.pdf](https://www.westerncape.gov.za/assets/departments/transport-public-works/Documents/green_is_smart-4th_july_2013_for_web.pdf)

<sup>10</sup> 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.

<sup>11</sup> Green New Deal (GND) proposals call for public policy to address climate change along with achieving other social aims like job creation and reducing economic inequality. The name harks back to the 'New Deal' economic recovery plan of the 1930s in the United States but blends it with modern ideas such as renewable energy and resource efficiency.

## VISION 2050

Climate change is recognised globally as an 'Emergency'<sup>12</sup>, and immediate systems change are required to achieve emissions reductions by 2030 and maintain a habitable planet. In the Western Cape, impacts of climate change 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 Strategy guides the bold shifts required by 2030 in order to ensure we meet our emissions reductions targets and create social and economic resilience in times of climate destabilisation. Our Vision in the province is that:

**In responding to the unfolding climate emergency, the Western Cape contributes to a prosperous, equitable, and inclusive South African society enabled through a just transition to a low-carbon and climate resilient economy, which is achieved by protecting and investing in our natural capital and rapidly accelerating the green growth trajectory by 2030. The aspiration is to be a net zero emissions province by 2050, resulting in a resilient economy and society that will thrive 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.

The Guiding Objectives, giving structure to the aspiration expressed in the Vision are:



**Effective response to the climate emergency**



**An equitable and inclusive transition to net zero emissions by 2050**



**Investment in natural capital to reduce climate risks and increase socio-economic resilience**



**Exemplary governance to lead a Just transition**

<sup>12</sup> <https://www.unep.org/explore-topics/climate-change/facts-about-climate-emergency>

## OUR STRATEGY

The following sections describe the climate change narrative that inform the climate change response actions for the Western Cape. The four Guiding Objectives structure the narrative, although the transversal nature of climate change implies some overlap between the objectives. Each Guiding Objective, however, is unpacked in the form of a Climate Action Pathway that specifies key targets along the journey to 2050, and a suite of actions necessary for achieving the targets.

The details of implementation for the Western Cape Government specifically, and the lead implementers, will be presented in a full Implementation Plan that will be developed subsequent to this Strategy document and will be finalised following the publishing thereof. The Strategy informs all stakeholder on their own direction of implementation, collaboration efforts, and investment planning.

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.



Figure 2. Structure of the WCCCRS Vision 2050

## OBJECTIVE 1. EFFECTIVE RESPONSE TO THE CLIMATE EMERGENCY

**We are currently in the 'now or never' decade<sup>13</sup>** as far as mitigating the impacts of climate change goes. Although no change to the climate would be the ideal, we are on a trajectory for 4°C rise in average global temperature by 2100 with increases in continental temperatures and temperature extremes in Africa being particularly severe. 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. The locked-in impacts, and nearly unimaginable 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, and associated deepened impacts, but this window of opportunity is only open until 2030<sup>14</sup>. 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 3 that time is quickly running out.

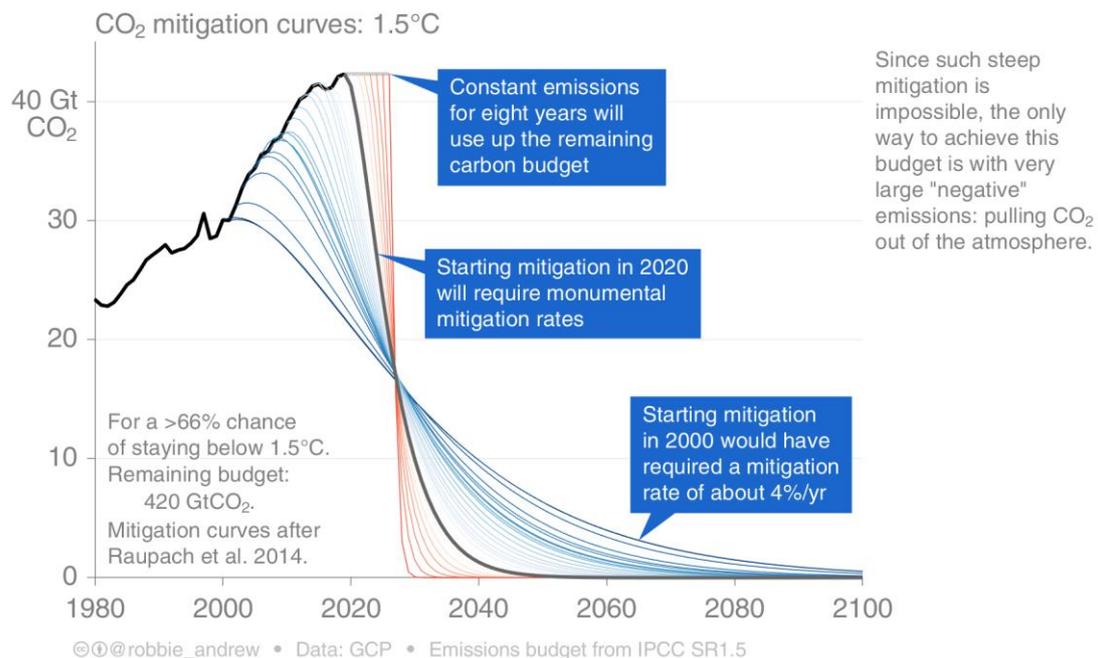


Figure 3. GHG emissions mitigation required for a 1.5°C global trajectory (<https://folk.universiteti-osl.no/roberan/t/global-mitigation-curves.shtml>)

<sup>13</sup> 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>

<sup>14</sup> See: The IPCC 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.

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 – in the Mediterranean, United States of America and Eastern Europe.

A 2017 study commissioned for the Western Cape shows that where climate change serves as a catalyst 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, policy makers must decide whether to protect the most exposed sectors or invest in the sectors that stand to benefit from climate change<sup>15</sup>.

#### **In response to the Climate Emergency we will:**

- Initiate a Climate Assembly, within a broader participatory engagement platform, to ensure that the voice of the citizenry is heard, the immediate needs of communities are responded to within the context of climate resilient development and government is held to its climate action commitments
- Bolster our disaster management response by
  - ensuring that early warning systems and effective communication systems are in place
  - Ensuring spatial planning and development planning reduces risks to people, infrastructure and assets
  - Increasing awareness of the climate emergency amongst the citizens and the civil service of the province
- Reduce coastal risks and public liability
  - The implementation of coastal management lines in spatial planning,
  - Managed coastal retreat where necessary
- Access international climate finance to stimulate and support climate-responsible economic and social development or investment
- Support Fire Protection Associations and mitigate the risk of wildland-urban and wildland-agriculture interface fires through appropriate ecosystem management

<sup>15</sup> 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>

## 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. 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. This will be achieved through innovation in how government structures include a science-based and participatory perspective in decision-making. Additional targets related to the emissions pathway that will result in reducing our climate change impacts are captured under Objective 2. Additional targets related to land use, and underpinning natural capital to support resilience are found under Objective 3. Key targets are identified for 2025 and 2030 (Table 1).

Table 1. Climate Action Pathway for our response to the Climate Emergency

<b>Climate Action Pathway (reductions relative to 2020 baseline)</b>			
<b>2025</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>
<ul style="list-style-type: none"> <li>• Early warning systems to provide long-term climate warnings and improved extreme weather assessments</li> <li>• No development in a 1:50 yr flood risk zone</li> <li>• Coastal Management Lines for all coastal Districts and Cape Town Metro</li> </ul>	<ul style="list-style-type: none"> <li>• Droughts anticipated by climate change projections accommodated in the Western Cape Water Supply System planning</li> <li>• International finance support breakthrough achieved</li> </ul>		

### 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')<sup>16</sup>.

Based on recommendations from the Presidential Climate Commission, South Africa submitted a revised NDC to the United Nations Framework Convention on Climate Change (UNFCCC) in 2021 with a climate change mitigation target range for 2030 of 350 – 420 Megatons (Mt) of Carbon Dioxide equivalent (CO<sub>2</sub>eq). 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.

<sup>16</sup> <https://climateactiontracker.org/countries/south-africa/>

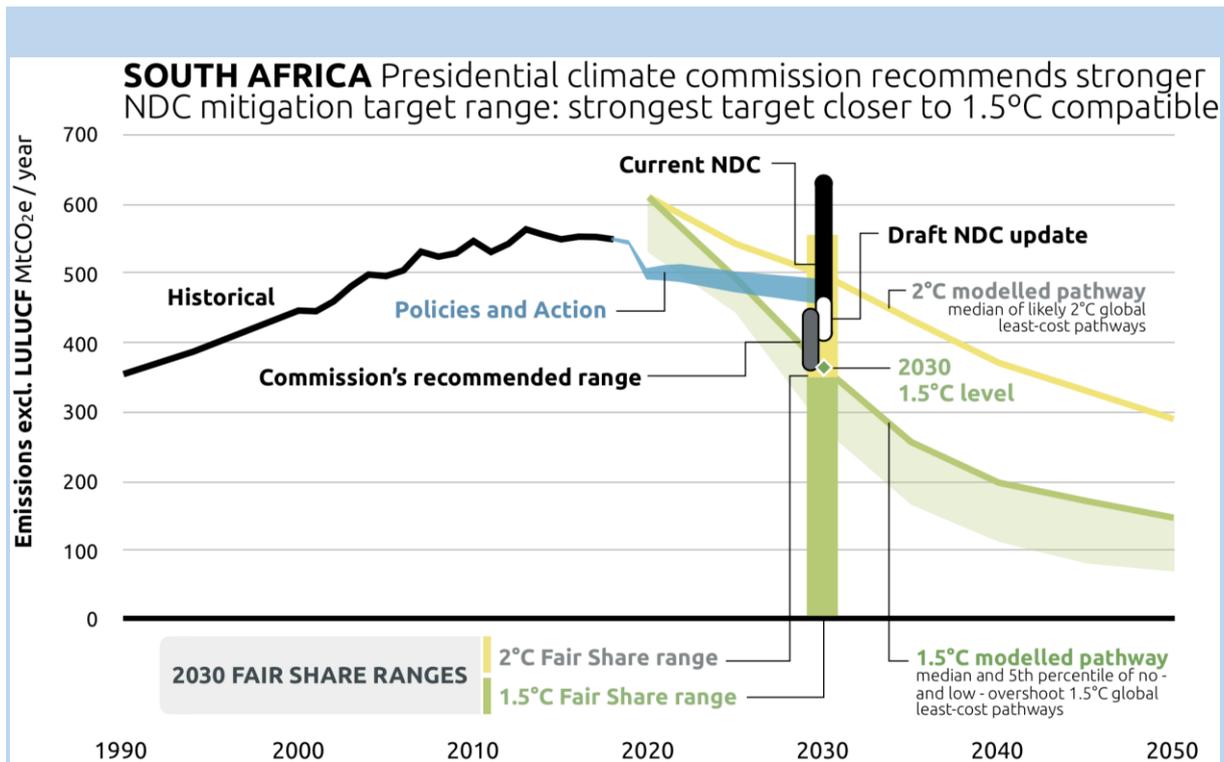


Figure 4. South Africa's fair share GHG mitigation compared to current country ambition

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

## OBJECTIVE 2. AN EQUITABLE AND INCLUSIVE TRANSITION 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*<sup>17</sup>. 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

Three energy consumption and related carbon dioxide emissions databases have been completed for the Western Cape Province to allow us to have a better understanding of where our energy-related emissions come from and where actions should be prioritised. Total emissions from the energy sector were estimated at around 6 tonnes CO<sub>2</sub>eq per capita in 2015/16, compared to the national value of 7.7 tonnes CO<sub>2</sub>eq, and an estimated 7.2 tonnes CO<sub>2</sub>eq per capita for Gauteng. Note that these figures are only for the energy sector emissions.

The largest proportion of the energy consumed in the province for 2015/16 is in the transport sector with 54%, followed by industry at 29%. Across the province the built environment (residential and commercial sectors) is only responsible for 15% of energy consumption. This highlights that most of the energy efficiency activities should take place in the industrial and transport sectors, although many of the interventions for the residential and commercial sectors are generally considered to be 'low-hanging fruit' – which has been the focus of attention to date.

Despite transport having the largest energy consumption, it is industry, however, that contributes the most to the provincial emissions profile at 36%, since it draws from coal-derived electricity as well as fairly large amounts of direct coal consumption. This is followed by the transport sector at 30%.

This Inventory work will be expanded to develop a full GHG profile for the Western Cape as part of the 2050 Emissions Pathways (commitment under the *Under2 Coalition*) process that is being undertaken in the 2020/21 and 2021/22 financial years.

<sup>17</sup> 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.

**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 markets<sup>18</sup>.

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 such 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 a short-term 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 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 2050<sup>19</sup>.

### **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 development**<sup>20</sup>. The lack of and/or limited access to modern energy results in the use of fuels such as wood, coal, candles and paraffin<sup>21</sup>, all of which pose severe health and safety risks<sup>22</sup>. 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. 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 challenges<sup>23</sup> as alluded to earlier.

<sup>18</sup> <https://www.irena.org/publications/2017/Oct/Electricity-storage-and-renewables-costs-and-markets>

<sup>19</sup> IPCC Special Report on Global Warming of 1.5°C ([www.ipcc.ch/sr15/](http://www.ipcc.ch/sr15/))

<sup>20</sup> International Energy Agency: <https://www.iea.org/articles/defining-energy-access-2020-methodology>

<sup>21</sup> 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

<sup>22</sup> Barnes et al., 2009: DOI: [10.17159/2413-3051/2009/v20i1a3296](https://doi.org/10.17159/2413-3051/2009/v20i1a3296)

<sup>23</sup> Sustainable Energy Africa, 2017 – Energy Poverty and Gender in Urban South Africa: <https://www.sustainable.org.za/uploads/files/file124.pdf>

## 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 high electricity consuming industries such as iron and steel manufacturing.

A 2017 study has shown 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 early<sup>24</sup>. 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. Proactive investment in the sectors that will benefit directly or indirectly from a carbon tax would serve the strategic interests of the provincial economy.

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 limited 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*<sup>25</sup> 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 SMME support programmes and could include planting of trees, building flood barriers, restoring natural landscapes; protecting and updating infrastructure such as transport and communications networks<sup>26</sup>.

<sup>24</sup> 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>

<sup>25</sup> Sector Jobs Resilience Plans: <https://www.tips.org.za/projects/current-projects/item/3936-sector-jobs-resilience-plans>

<sup>26</sup> United Nations Environment Programme (2021). *Adaptation Gap Report 2020*: <https://www.unep.org/resources/adaptation-gap-report-2020>

**BOX 4. Climate impacts on marine transport**

One of the critical sectors that needs thorough assessment and adjustment is marine transport and shipping. Currently, marine shipping is responsible for about 2.5% of the global GHG footprint<sup>1</sup>, which makes it vulnerable to the escalating cost of emissions.

The Western Cape ports, including Cape Town, Saldanha Bay and Mossel Bay handle around 20%-30% of the cargo into South Africa, reaching about 80 million tonnes in 2015<sup>1</sup>. The marine services industry is therefore identified as a key sector for the Western Cape economy and deserving of attention.

At the same time, coastal facilities will increasingly be exposed to the damaging effects of rising sea levels and potentially increasing storm intensities.

**In order to achieve an equitable and inclusive transition to net zero emissions by 2050, the following actions need to be put in place in both the short- and the long-term:**

- Net Zero by 2050
  - Pursue a 2050 Emissions Pathway exercise, planning for a net zero emissions state by 2050
  - Low-emissions planning and budgeting being integrated into macro-economic planning
  - Ensure that net zero pathways have included climate change risk so that risk exposure to climate impacts is not inadvertently increased
  - Employment risks forecasting and plan a just transition, specifically taking gender into consideration, in concert with the shift of economic activities to low-carbon sectors
  - Rapidly tighten controls over emissions to reduce the release of short-lived climate forcers such as methane and black carbon
  - Enhance carbon sinks in both the natural and built environments
- Energy sector
  - Facilitate greater access by all municipalities to renewable energy, including through for example independent power producer contracts
  - Actively encourage innovation in energy services provision to accommodate renewable energy input and improve access to energy in low-income areas
- 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
  - Consider integrating non-motorised transport into a low-carbon transport system.
- Built environment
  - Continue to improve resource efficiency in the built environment, specifically addressing transport, land, water and energy efficiencies, as well as spatial planning challenges
  - 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
- Capacitate people living in informal settlements to become resilient through innovative responses to climate risks
- Pursue a circular economy
  - no waste is sent to landfills, and where GHG emissions from waste, especially organic waste, is avoided or captured for use
  - within the context of the Fourth Industrial Revolution, we focus on how locally appropriate technological innovation and decentralised systems can assist in solving service delivery challenges, create meaningful employment without increasing the skills gap and reap the benefits of advances in information technology
- Collaborate with provincial development facilitation programmes, such as Wesgro or GreenCape, to provide stimulus for private sector responses that align with the vision and objectives for climate change response

## 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. Key targets are identified for 2025, 2030, 2040 and 2050 (Table 2).

Table 2. Climate Action Pathway linked to response trajectories and programmes

<b>Climate Action Pathway (reductions relative to 2020 baseline)</b>			
<b>2025</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>
2.5% of Government Motor Transport fleet to be zero emissions vehicles	Zero organic waste to landfill	Net zero electricity	Net zero province
500MW renewable energy installed in the Western Cape	25% of new vehicle sales to be zero emissions vehicles	No new heavy-duty internal combustion engine vehicles for public fleets	Zero waste to landfill
2050 emissions pathway finalized	Freight moved by rail		
No fossil fuel investment by public funds	No new internal combustion engine public transport vehicles		
	50% reduction in methane emissions		
	No new light-duty internal combustion engine vehicles for public fleets		

<b>Climate Action Pathway (reductions relative to 2020 baseline)</b>			
<b>2025</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>
	Cape Town and 4 other municipalities with microgrid accommodation capacity  All new government buildings to be net zero  Carbon offset scheme formalised		

## OBJECTIVE 3. INVESTMENT IN NATURAL CAPITAL TO REDUCE CLIMATE RISKS AND INCREASE SOCIO-ECONOMIC RESILIENCE

**The Western Cape's biological diversity and natural resources are under threat** from pollution, overexploitation, invasion by alien plant species and escalating 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 planning<sup>27</sup>.

It is, imperative to address these threats and impacts, as they ultimately impact our economic potential from tourism, agriculture, the blue economy, and freshwater supplies. This affects all aspects of our lives, including industries and the economy at large; success of which are fundamentally resting on the health of our underlying ecosystems. We can no longer make investment and development planning decisions that undermine our natural capital and a new regenerative approach is required.

**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 at risk regions from climate impacts. Agriculture has a key role to play and is already leading in promoting farming practices that both restores 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.

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 protected<sup>28</sup>.

<sup>27</sup> State of Environment Outlook Report: Biodiversity and Ecosystem Health: [https://www.westerncape.gov.za/eadp/files/atoms/files/04\\_Biodiversity%20and%20Ecosystem%20Health.pdf](https://www.westerncape.gov.za/eadp/files/atoms/files/04_Biodiversity%20and%20Ecosystem%20Health.pdf)

<sup>28</sup> State of Environment Outlook Report: Biodiversity and Ecosystem Health: [https://www.westerncape.gov.za/eadp/files/atAoms/files/04\\_Biodiversity%20and%20Ecosystem%20Health.pdf](https://www.westerncape.gov.za/eadp/files/atAoms/files/04_Biodiversity%20and%20Ecosystem%20Health.pdf)

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 Government<sup>29</sup> 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 Restoration<sup>30</sup>, 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 events<sup>31</sup>.** 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 *El Niño* and 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, the 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 2018<sup>32</sup>. 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.

**The investment into restoration and enhancement of our natural capital will include *inter alia*:**

- Managing ecosystems, wildlands and the conservation estate
  - Focussing on 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
- Restoring the ecological functioning and water quality in our watercourses,
  - Through rehabilitation of degraded riverine and wetland habitat,
  - Halting water pollution,
  - Ensuring the proper functioning of wastewater treatment plants.
- Coordinate Ecosystem-based Adaptation activities
  - Through the implementation of the Western Cape Ecological Infrastructure Investment Framework Expand

<sup>29</sup> Available from the Department of Environmental Affairs and Development Planning

<sup>30</sup> <https://www.decadeonrestoration.org/>

<sup>31</sup> 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.

<sup>32</sup> Personal communication, Western Cape Disaster Management Centre

- Fully implementing the SmartAgri plan<sup>33</sup>, focussing on soil restoration through conservation agriculture practices
- Reduce coastal risks through development management, reinforcement and deployment of natural defences,
- 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

## Response pathway

The targets along the Climate Action Pathway in respect of using investment in natural capital as a means to take advantage of opportunities will aim to restore ecosystem functioning at scale. Immediate actions must remove people out of harm's way, and start protecting our water resources. Future actions will focus more on conservation and restoration of natural resource areas. Key targets are identified for 2025, 2030, 2040 and 2050 (Table 3).

Table 3. Climate Action Pathway for investing in our natural capital

<b>Climate Action Pathway (reductions relative to 2020 baseline)</b>			
<b>2025</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>
Ecological base flow secured for priority rivers	<p>All wastewater treatment works properly maintained and optimally functional</p> <p>30% of land and sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved</p> <p>Further loss of endangered habitats stopped.</p> <p>60% of agricultural land farmed with conservation or regenerative agricultural techniques</p>	Minimum ecological standards achieved for water quality in watercourses and waterbodies	Positive balance for carbon sequestration in soil

<sup>33</sup> Western Cape Climate Change Response Framework and Implementation Plan for the Agricultural Sector

## OBJECTIVE 4. EXEMPLARY GOVERNANCE TO LEAD A JUST AND INCLUSIVE TRANSITION

### 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. In addition to 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 women<sup>34</sup>. Climate change will affect how these dynamics play out in society.

<sup>34</sup> Caroline Sweetman & Louise Medland (2017) 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 2016<sup>35</sup>.

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 safe<sup>36</sup>. 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 future<sup>37</sup>. 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 [5<sup>th</sup> Assessment Report of the Intergovernmental Panel on Climate Change](#)<sup>38</sup> 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](#)<sup>39</sup> 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 Western Cape Climate Change Response Strategy. 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 will further highlight and acknowledge progress that has been made in addressing gender disparities as well as identify opportunities to design

<sup>35</sup> <https://mg.co.za/special-reports/2020-12-04-gender-based-violence/>

<sup>36</sup> <https://www.who.int/life-course/news/commentaries/women-children-adolescents-in-emergencies/en/>

<sup>37</sup> 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)

<sup>38</sup> [https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA\\_FINAL.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIAR5-PartA_FINAL.pdf)

<sup>39</sup> [https://www.environment.gov.za/sites/default/files/docs/national\\_policy\\_framework.pdf](https://www.environment.gov.za/sites/default/files/docs/national_policy_framework.pdf)

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.

**Implementation of the existing climate change response strategy has thus far been too slow.** The 2014 Western Cape Climate Change Response Strategy<sup>40</sup> (WCCCRS) 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'<sup>41</sup>. 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 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 WCCCRS<sup>42</sup>.

<sup>40</sup>[https://www.westerncape.gov.za/text/2015/march/western\\_cape\\_climate\\_change\\_response\\_strategy\\_2014.pdf](https://www.westerncape.gov.za/text/2015/march/western_cape_climate_change_response_strategy_2014.pdf)

<sup>41</sup>

[https://www.westerncape.gov.za/eadp/files/atoms/files/Biennial%20Climate%20Change%20ME%20Report%202020\\_final.docx.pdf](https://www.westerncape.gov.za/eadp/files/atoms/files/Biennial%20Climate%20Change%20ME%20Report%202020_final.docx.pdf)

<sup>42</sup> A review done for the Climate Change Directorate of DEA&DP in 2018 – available from the Department on request

**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 Climate Change Coordinating 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*<sup>43</sup> 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.

**The governance actions or responses required to realise an equitable resilient society, include:**

- A governance framework for climate change response
  - Convene 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
  - Use the Western Cape Climate Change Forum to coordinate, facilitate and share information on climate change responses among all stakeholders
  - Lay the foundations for a Climate Assembly, within a broader participatory engagement platform, to facilitate participation in climate change debates, especially for those societal groups previously marginalised like women and the youth, and provide an accountability platform to government for the necessary response planning and actions
  - Involve 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
- Government financial systems
  - Build capacity and align the protocols, guidance and assessment criteria for government financial structures to mainstream low-carbon, climate-proof planning, budgeting and procurement, as well as monitoring and

<sup>43</sup> <https://www.c40.org/>

- reporting on implementation and impact, and provide for innovation in funding types
  - Develop systems to enable climate budget tagging
  - Support Sustainable Public Procurement to support low-carbon and more socially responsible goods and services
- Government services
  - Through red-tape reduction and incentive schemes, create an institutional environment that encourages private sector innovation and investment in climate-proof development projects
  - Design innovative energy service delivery for low-income communities, particularly looking at cleaner fuels and alternative energy technologies
  - Ensure that the provision of basic services takes a long-term view that is climate proof
  - Mainstream climate change linked resilience thinking into social welfare systems that extend to food security, and mental health support
  - 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 and making sure that early warning systems improve health sector responses to extreme events
- Disaster risk reduction
  - Prioritise disaster response strategies that recognise the specific vulnerabilities of women and equip them with the knowledge, skills and resources to be more resilient
  - Identify 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
  - Enhance capacity of people to respond to climate impacts and avoid informal settling in at-risk areas
- Collaboration
  - Among other tools, use 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
  - Expand national and international networking, exchange programmes and learning from other regions, such as through the *Under2 Coalition*

## Response pathway

Our Climate Action Pathway in respect of good governance leading an equitable and inclusive transition will strive to reduce vulnerabilities and specifically improve on the representation of gender 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. Key targets are identified for 2025, 2030 and 2040 (Table 4).

Table 4. Climate Action Pathway for a just and inclusive transition

<b>Climate Action Pathway (reductions relative to 2020 baseline)</b>		
<b>2025</b>	<b>2030</b>	<b>2040</b>
<p>Employment transition plans for the energy and agriculture sectors</p> <p>A fully functional Climate Change institutional structure</p> <p>Climate budget tagging in the Western Cape Government</p>	<p>50% reduction in poverty</p> <p>No hungry households</p> <p>Improve the representation of women in climate change decision making by 20%, with the ultimate goal being equal representation</p> <p>Sector strategies for Health, Transport, Agriculture &amp; Economic Development</p> <p>Systems in place to determine gendered climate impacts</p>	<p>Universal access to basic services</p> <p>Climate change responses mainstreamed in government strategic objectives</p>

## 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.

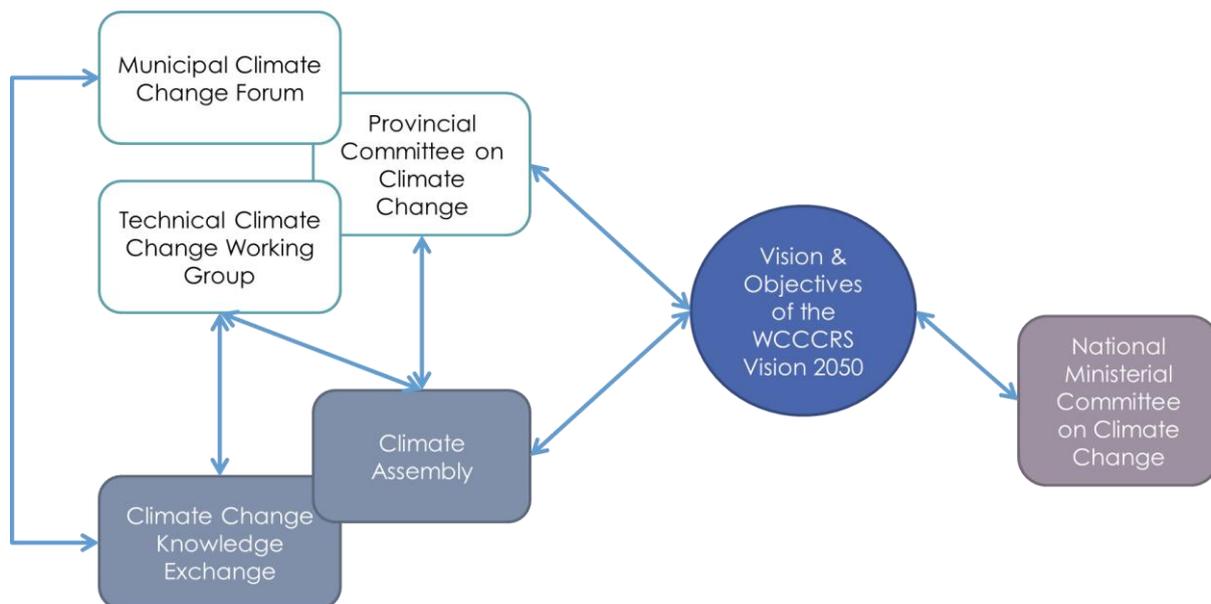


Figure 5: Institutional arrangements for climate change governance in the Western Cape

### **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 be convened as an "event" and a platform for civil society, business, academia, youth groups and all other stakeholders to engage on climate change response actions in the Western Cape. It will be an opportunity to 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), Industrial Process and Product Use, waste and Agriculture, Forestry and Other Land Use 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 Deal<sup>44</sup>)***

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 2021<sup>45</sup>)***

Given the current economic situation in South Africa, particularly now with the COVID-19 pandemic, we need to collectively direct the structure, spending and operational models of all to identify 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 time<sup>46</sup>. We should avoid the ‘sunk cost’ fallacy implying that 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.

The above considerations can be distilled into a handful of urgent response actions, within a basket of other transformative changes that collectively represent a low-carbon, people centred economic trajectory. These actions will be prioritised whilst

<sup>44</sup> The European Green Deal - [https://ec.europa.eu/info/sites/info/files/european-green-deal-communication\\_en.pdf](https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf)

<sup>45</sup> <https://www.gov.za/blog/desk-president-88>

<sup>46</sup> OECD: [https://www.oecd-ilibrary.org/environment/the-economic-consequences-of-climate-change\\_9789264235410-en](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](https://www.consilium.europa.eu/media/39480/ttr_special-issue_climate-change_2019.pdf)

the Implementation Plan that accompanies the WCCCRS Vision 2050 is in development.

**The immediate Priority Actions 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 **Municipal Energy Resilience programme**
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 strategy**
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. Identify climate change hazards as part of **Risk Assessments in Disaster Management Plan(s)**
7. Develop a **Short-Lived Climate Forcers Strategy** for urgent curtailing of emissions such as methane, ozone, refrigerants and aerosols
8. Utilize the **Ecological Infrastructure Investment Framework** as a backbone to investment into natural capital and the restoration of our land and oceans
9. Create a space for citizenry to have their voices heard, in the form of a **Climate Assembly** and ensuring that women have a voice
10. Ensure that there are **effective climate governance structures** that can provide technical support to the Western Cape Government, including the Premier and Treasury
11. Utilize a **sustainable procurement programme and public employment programmes** to create sustainable jobs and divest from fossil fuels, whilst ensuring women's economic empowerment
12. Consider **climate change in all development and spatial planning processes**
13. Develop a roadmap and mechanism for the formulation of **sector-specific climate change response strategies**

The rest of the items in the response baskets identified under the four Guiding Objectives represent broader transitions that are required across all sectors. 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 1.5°C is far more habitable than 2°C, so will expedited action be more effective and less costly than delayed action. 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 Cape<sup>47</sup> 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.

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<sup>47</sup> 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

AR4	Fourth Assessment Report
AR5	Fifth Assessment Report
AR6	Sixth Assessment Report
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> eq	Carbon dioxide equivalent
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
LTAS	Long Term Adaptation Scenarios
Mt	megaton
NAEIS	National Emissions Inventory System
NDC	Nationally Determined Contribution
RCP	Representative Concentration Pathways
SmartAgri	Western Cape Climate Change Response Framework and Implementation Plan for the Agricultural Sector
SSP	Shared Socio-economic Pathway
TNC	Third National Communication
UNFCCC	United Nations Framework Convention of Climate Change
WCCCRS	Western Cape Climate Change Response Strategy

## GLOSSARY OF TERMS<sup>48</sup>

Anthropogenic global warming	This refers to the raising of the Earth's average temperature as a result of human activities that produce and emit greenhouse gases. Such activities typically involve the burning of fossil fuels, but also include activities such as agriculture and deforestation.
Blue economy	This is an economic term relating to the use of ocean resources for socio-economic growth. <sup>49</sup>
Carbon footprint	A calculation of the total amount of greenhouse gases that are generated by an action, process or actor.
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. <sup>50</sup>
Climate Assembly	An engagement platform that facilitates public participation and contribution in regard to the formulation of climate related policy
Climate change	Any change in long-term climatic conditions, but in the context of this document intended to specifically refer to out of the ordinary changes induced by human activities since the industrial revolution.
Climate change adaptation	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.
Climate change mitigation	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.
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

<sup>48</sup> 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.)].

<sup>49</sup> <https://www.worldbank.org/en/news/infographic/2017/06/06/blue-economy>

<sup>50</sup> <https://www.ellenmacarthurfoundation.org/circular-economy/concept>

	achieve net zero emissions by 2050 to keep the global temperature increase below 2°C. <sup>51</sup>
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.
Climate resilience	This refers to the capacity of social, economic and environmental systems to cope, manage and respond to hazardous events or trend as a result of climate change in a manner that enables essential functions and capacity for adaptation to be maintained.
Coastal Management Line	A risk-based planning tool for designating development-compatible coastal land
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. <sup>52</sup>
Ecosystem-based adaptation	A nature-based solution that harnesses biodiversity and ecosystem services to reduce vulnerability and build resilience of human communities to climate change.
<i>El Niño</i>	The <i>El Niño</i> -Southern Oscillation is an oceanic event associated with a fluctuation of global-scale tropical and subtropical surface pressure patterns which are identified to periodically warm the tropical Pacific Ocean.
Emissions pathway	A calculated transformational process detailing long-term emissions mitigation reductions for governments
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.

<sup>51</sup> <https://globescan.com/report-2020-climate-survey-evaluating-progress/>

<sup>52</sup> South African National Biodiversity Institute (SANBI)

Fourth Industrial Revolution	Building on the third industrial revolution which marked the rise of electronics and telecommunications, the Fourth Industrial Revolution describes the period in which technological innovations have led to the integration of the physical, digital and biological spheres to produce advancements such as artificial intelligence, automation and data generation. <sup>53</sup>
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. <sup>54</sup>
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. <sup>55</sup>
Greenhouse gas (also 'carbon emissions')	These are gases that absorb infrared radiation within the Earth's atmosphere resulting in the warming of its climate through what is known as the greenhouse effect. The primary greenhouse gases in Earth's atmosphere are water vapor (H <sub>2</sub> O), carbon dioxide (CO <sub>2</sub> ), methane (CH <sub>4</sub> ), nitrous oxide (N <sub>2</sub> O), ozone (O <sub>3</sub> ) and chloroflourocarbons. These gases are typically released through the burning fossil fuels.
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.
Just Transition	A form of systematic social and economic adjustment that elevates concerns about social justice.
Natural Capital	Refers to the world's stocks of natural assets. Examples of these assets include soil, water, air and all living things <sup>56</sup> . 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

<sup>53</sup> <https://www.weforum.org/agenda/2016/01/what-is-the-fourth-industrial-revolution/>

<sup>54</sup> <https://www.unenvironment.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy>

<sup>55</sup> <https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=670&menu=1515>

<sup>56</sup> <https://naturalcapitalforum.com/about/>

	contribute to developing resilience to negative impacts associated with an altered climate.
Net Zero	Net zero emissions by 2050 is a goal set out for signatories to the Paris Agreement to limit global temperature increase to under 2 degrees. Net zero emissions are achieved when emissions are balanced with the removals of greenhouse gases into the atmosphere.
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.
Short lived climate forcers	This refers to a set of compounds that have short lifetimes in the atmosphere, where their effect on climate is experienced predominantly in the first decade after their emission. Examples of these compounds include methane, ozone and aerosols.
Transit orientated development	This is an urban planning term used to describe development that locates mixed land uses (i.e. residential, business and leisure) in close proximity to public transport. <sup>57</sup>
Vulnerability	The propensity of an individual, element or system to be adversely affected
Zero emissions vehicle	A vehicle that produces no noxious tailpipe emissions and does not require energy derived from non-carbon neutral sources.

<sup>57</sup> <http://tod.org/>

## WHAT SCIENCE SAYS ABOUT CLIMATE CHANGE IN THE WESTERN CAPE

The bulk of this Annexure presents information on observed and projected climate trends for the Western Cape province in the form of an updated extract from a report produced by the Climate System Analysis Group (CSAG) and African Climate Development Initiative of the University of Cape Town. The 2017 *Report on the updated Risk and Vulnerability component of the 2008 Climate Change Response Strategy*<sup>58</sup> formed part of a broader review of provincial climate change response strategies and action plans.

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.

South Africa has been warming significantly over the period 1931-2015. Over the western parts of the country including much of the Western and Northern Cape, the observed rate of warming has been 0.2°C/decade or even higher – more than twice the global rate of temperature increase – thus equivalent to almost 2°C over a century timespan. Associated increases in extreme maximum temperature events have occurred, along with a decrease in cold nights. There is strong evidence of statistically significant increases in rainfall occurring over the southern interior regions over the period 1921-2015, including large areas of the eastern interior of the Western Cape. Extreme daily rainfall events have significantly increased over these same areas. Some of the observed trends are listed in Table 5.

In summary, the climate of the Western Cape will continue to be characterised by cycles of drier and wetter years for the next 20 to 30 years. At the same time average temperatures rise at around 0.5 °C /decade, so the average temperatures will reach 1.5 °C higher than recent historical averages somewhere between 2040 and 2060. The impact of these higher temperatures will increase the frequency and length of hot spells in summer, as well as decrease the frequency and duration of cold spells in winter.

Moving towards the middle of the 21<sup>st</sup> century, there are consequently two possibilities due to some uncertainty with regards to changes in precipitation:

- Natural cycles of rainfall begin to shift towards more frequent dry years and consecutive dry years. OR
- Natural cycles of rainfall will continue, but changes in average rainfall begin to emerge. Rainfall in the mountains increases as a result of more moist and energetic winter storms, as well as increased moist warm southerly flow off the ocean in the

<sup>58</sup> Available from the Western Cape Government Climate Change Directorate

summer months. While coastal and inland plains do not experience these changes directly, they have important impacts on water supply and irrigation as river flows increase and runoff into dams increase. However, increased rainfall is offset by increased evaporation due to higher temperatures (reaching 2 °C higher than current) and stronger winds.

This 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 around the world. Furthermore, 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 2007<sup>59</sup>. In 2013/2014, the Fifth Assessment Report (AR5) was released<sup>60</sup>. 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 Sixth Assessment Report (AR6) is currently in preparation, with its constituent reports due for staggered release throughout 2021 and 2022<sup>61</sup>. The first report, documenting global physical climate science, was released on 6 August 2021. AR6 products will be used to inform policy and implementation decisions going forward. This is supplemented with the IPCC's *Global Warming of 1.5°C*<sup>62</sup> report, which is referenced earlier in this Strategy.

The most recent set of projections specifically for South Africa and its Provinces is presented in Chapter 3 of South Africa's Third National Communication (TNC) to the United Nations Framework Convention on Climate Change (UNFCCC)<sup>63</sup>. 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 project<sup>64</sup>, and climate change projections for Western Cape municipal climate change response plans.

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](http://www.greenbook.co.za)). The projections should, however, be used with circumspect, as they present trends that are not always compatible with lower resolution (e.g. regional) model outputs that are expected to have a higher level of confidence.

<sup>59</sup> <https://www.ipcc.ch/reports/?rp=ar4>

<sup>60</sup> <https://www.ipcc.ch/reports/?rp=ar5>

<sup>61</sup> <https://www.ipcc.ch/assessment-report/ar6/>

<sup>62</sup> <https://www.ipcc.ch/sr15/>

<sup>63</sup> <https://unfccc.int/documents/181851>

<sup>64</sup> [https://www.environment.gov.za/sites/default/files/docs/climate\\_trends\\_bookV3.pdf](https://www.environment.gov.za/sites/default/files/docs/climate_trends_bookV3.pdf)

Table 5: Observed and Projected Climate Change Impacts<sup>65</sup>

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
Temperature	<p>A general trend of rising temperatures, 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. Rates of warming are likely to be higher in spring. The following summarises the projections for three future time periods, relative to the baseline period 1921-2015 (dynamic downscaling) and 1986-2005 (statistical downscaling):</p> <p><b>2016-2035:</b> Most models regardless of emission/mitigation scenario agree that the magnitude of warming will be approximately 0.5°C (coastal) to 1.0°C (inland).</p> <p><b>2046-2065:</b> Model projections diverge, ranging from 1.0°C to 4.5°C depending on the model and the mitigation scenario. Significant differences emerge between the RCP4.5 and RCP8.5 downscalings<sup>66</sup>. For the Western Cape, the projection is generally 1°C - 2°C warming, with a median of approximately 1.5°C. However, for some of the 'worst-case' RCP8.5 downscalings, the projections are up to approximately 4.5°C.</p> <p><b>2080-2100:</b> There is disagreement between models and depending on emission/ mitigation scenario: generally, 2°C - 4°C, while some models project even greater warming for RCP8.5. Lower rates of warming are indicated for the southern coastal areas.</p>	<p>Increased temperatures and increased evapotranspiration result in dry soils and vegetation which becomes more fire-prone – 7 January 2016 was the highest temperature recorded in 100 years in Cape Town at 45°C. Such high temperatures usually coincide with severe fires.</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 grow.</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>

<sup>65</sup> [https://www.westerncape.gov.za/eadp/files/atoms/files/WC%20Climate%20Change%20Response%20Strategy%20Biennial%20M%26E%20Report%20%282017-18%29\\_1.pdf](https://www.westerncape.gov.za/eadp/files/atoms/files/WC%20Climate%20Change%20Response%20Strategy%20Biennial%20M%26E%20Report%20%282017-18%29_1.pdf)

<sup>66</sup> The designation 'RCP' refers to 'Representative Concentration Pathways' which define the target radiative forcing at the year 2100, at 4.5 Watts per square metre (Wm<sup>-2</sup>) for RCP4.5 and 8.5 Wm<sup>-2</sup> for RCP8.5. The RCP8.5 scenario can be seen as the 'worst case' scenario with little to no global mitigation of GHG emissions, and the RCP 4.5 scenario as a 'positive outlook' scenario with good global co-ordination of mitigation efforts. The latest global emission data shows that we are still following the 'worst case' scenario. In AR6, the designation was changed to *Shared Socio-economic Pathways* or 'SSP'.

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
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 increasing severity of rainfall events (i.e. more rain falls in a shorter time).</p> <p>Winter rainfall season starting later each year.</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. The following summarises the projections for three future time periods, relative to the baseline period 1921-2015 (dynamic downscaling) and 1986- 2005 (statistical downscaling):</p> <p><b>2016-2035:</b> Models show mixed, relatively small and insignificant changes in annual total rainfall.</p> <p><b>2046-2065:</b> Many models show significant changes, with the majority of models showing decreased rainfall, especially in south-western South Africa, and a few showing increased rainfall in various regions, particularly in the summer rainfall region.</p> <p><b>2080-2100:</b> These patterns are strengthened, with the majority of models under RCP8.5 showing significant drying and a minority of models showing increased rainfall.</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>
Wind		<p>Wind velocity expected to increase, with stronger South Easterers.</p>	<p>Impacts on tourism: e.g. Table Mountain cable car operations, Robben island ferry operations, Beach usability etc.</p> <p>Has an influence on wave height and power.</p>
Sea level rise	<p>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</p>	<p>The TNC concludes that the best estimate (or 'central estimate/mid scenario') of sea level rise by 2100 is around 1 m, with a plausible worst-case scenario of 2 m and a best-case scenario (low estimate) of 0.5 m. The corresponding best estimate (mid-scenario) projections for 2030 and 2050 are 0.15 m and 0.35 m, respectively. The 2013 IPCC report,</p>	<p>There is global concern that previous estimates of the rates of sea level rise may have been too optimistic, and that decision makers need to be aware that worst case scenarios in this century may be possible.</p>

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
	<p>with the difference emanating from differential geological conditions and temperatures.</p>	<p>AR5, suggests a slightly more conservative projection of sea-level rise around the Western Cape of 0.6 to 0.8 m by 2100.</p> <p>The IPCC AR6 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. It refrains from reporting conclusive projections from 2050 onwards due to uncertainty over the global GHG mitigation efforts.</p>	
<p>Storm Surges (big storm events)</p>	<p>In the past 15 years various big storm events have caused infrastructure damage along the Western Cape coastline. Studies reflect sea level has risen on the Western Cape coastline in accordance with global trends. Most impacts are related to inappropriate coastal development.</p>	<p>The TNC indicates that no quantitative studies have to date been performed, where dynamic climate model projections have been linked to quantitative wave modelling. This represents a gap in southern African climate change impacts assessments, and an area of future work.</p> <p>Assuming a relatively modest increase of 10% in oceanic wind speed off southern Africa implies a 12% increase in wind stress, a 26% increase in wave height, and as much as an 80% increase in wave power. This means that a modest 10% increase in wind speed could also result in a potentially significant increase in coastal sediment transport rates and consequently impact on estuarine mouth regimes. The dynamic processes in the ocean, and especially on the coast, are thus mostly a non-linear system and small changes in the atmospheric could have a drastic effect on our coast.</p> <p>It should be noted however, that many of the regional changes in circulation over southern Africa argue for the decreasing impact of severe storm events along the South African coastline: the westerly wind regime and cold fronts are projected to be displaced poleward, implying a poleward</p>	<p>Coastal municipalities potentially have a big role to play here. Insurance companies are starting to withdraw from some vulnerable coastal areas.</p>

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
		displacement of the swell and wind waves these systems generate. Moreover, this poleward displacement of frontal systems will plausibly be associated with a strengthening of the subtropical high-pressure belt over southern Africa. Consequences of these changes may include the decreasing occurrence of cut-off lows and equatorward displacement of land-falling tropical cyclone tracks.	
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 <sup>67</sup> .		Impacts of shifting marine resources have implications for social and economic fabric of coastal communities.
Ocean Acidification <sup>68</sup>	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.
Floods / Droughts	Numerous flood and drought events have occurred in the Western Cape in the past decades with increasing frequency. It is difficult to determine if these are all attributable to a changing climate, but this is likely given similar trends globally.		

<sup>67</sup> SAEON. 2011 Observations in Environmental Change in South Africa.

<sup>68</sup> As the ocean absorbs CO<sub>2</sub> its PH changes.

Climate Variable	Observed (measured) trends	Projected (expected) trends	Outlook and Comments
Fire	Observed increased fire incidences <sup>69</sup> and potential increase in extent and severity of fires.  2015 fires occurred in record breaking hot temperatures:		It is challenging to differentiate how much of the increase in fires and intensity is climate change related, but global trends indicate climate change has a role to play.  The economic implications to the various industries are significant.
Hail	There is anecdotal evidence that more hailstorms are occurring, and occurring in new areas of the Western Cape, causing economic losses to agriculture (SmartAgri Status Quo Report <sup>70</sup> ).		The increased likelihood of hailstorms is not well understood, but damage to agricultural crops are potentially significant.

#### **Extreme Events (these can result and be related to one or more of the above climate variables)**

Between 2003 and 2008 direct damage related to climate events in the Western Cape amounted to approximately R3 Billion; particularly from floods and droughts (Eden District and Central Karoo droughts of 2009/10 and floods of 2011 etc.). Newer data to 2015 is likely to be higher.

Current disaster funding approaches are not sufficient for responding to climate change. These funds are generally reactive, and disaster funding is often utilised to rebuild the exact same infrastructure in the exact same places. In order to respond effectively and responsibly to climate change all departments need to integrate climate change into infrastructure build and planning, and to utilise standards appropriate for a changed climate regime.

<sup>69</sup><http://www.iol.co.za/news/south-africa/western-cape/cape-fire-insurance-firms-brace-for-claims-1.1827557#.VfnA8RGeDGc>

<sup>70</sup> 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>



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