ICAT Provincial Situational Analysis Report

April 2024

DISCLAIMER

PREPARED UNDER

The Initiative for Climate Action Transparency (ICAT), supported by Austria, Canada, Germany, Italy, the Children's Investment Fund Foundation, and the ClimateWorks Foundation.

The ICAT Secretariat is managed and supported by the United Nations Office for Project Services (UNOPS)

ICAT South Africa

Institutional strengthening support to South Africa on the Institutionalisation of the Climate Change Mitigation System tools to support the implementation of its NDC.

Grant No. 1875-003/ICAT/2023/06

Provincial Situational Analysis Report

AUTHOR:

Daniella de Jager

Gondwana Environmental Solutions

Date: 22 April 2024

Reviewed by:

Name: Luanne Stevens

Affiliation: Gondwana Environmental Solutions

Date: April 2024

DFFE Approval:

Name:

Position:

Date:

TABLE OF CONTENT

INTRODUCTION

South Africa is the southernmost country in Africa. It is bounded to the south by 2,798 kilometres of coastline that stretches along the South Atlantic and Indian Oceans; to the north by the neighbouring countries of Namibia, Botswana, and Zimbabwe; and to the east and northeast by Mozambique and Eswatini. It also completely enclaves Lesotho. It has a population of over 62 million people and covers an area of 1,221,037 square kilometres.

South Africa is divided into 9 provinces (figure 1):

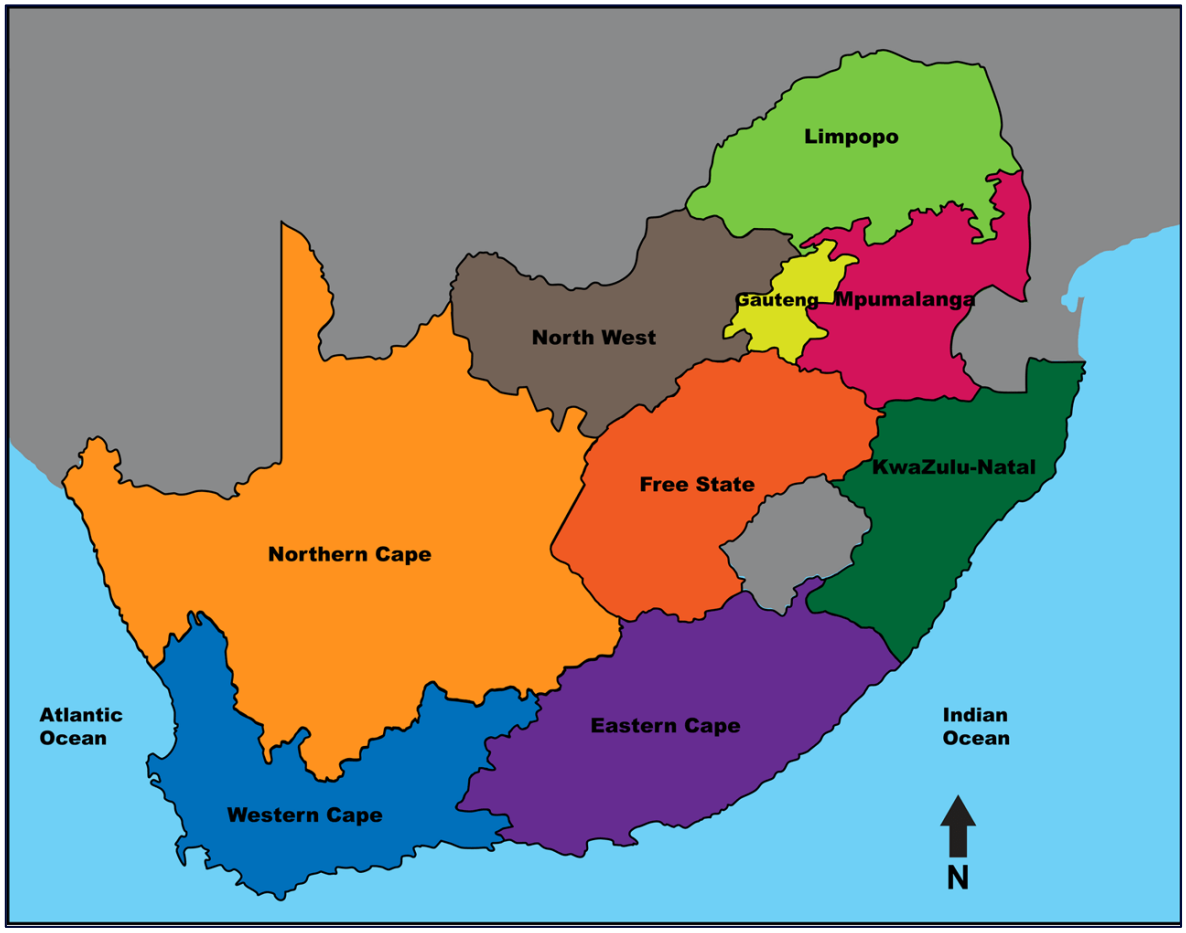

Figure 1: South Africa Provinces (Intergate Immigration, 2024).

- **Western Cape**: The Western Cape lies in the southwestern region of South Africa, bordered by both the Indian and Atlantic Oceans. It shares its borders with the Northern Cape and Eastern Cape provinces (Britannica, 2024). The province has a population of approximately 6.2 million which is around 11,3% of the South African population (Britannica, 2024). With an area size of 129 000 square kilometres this province is known for its rich biodiversity and protected area. Some of the main economic activities in this province includes agriculture, fisheries, finance and tourism (Wenger, 2023).**Eastern Cape**: The Eastern Cape is bordered by the Indian Ocean, Western and Northern Cape, KwaZulu Natal, Free State, as well as the country of Lesotho. With a population of 6.9 million, constituting 12.6% of South Africa's population, it spans

around 170,000 square kilometres (South African Government, 2024). The Eastern Cape is known for being a popular holiday destination with diverse landscapes, climates and marine life. Throughout much of the year, both local and international tourism significantly contribute to the economic vitality of the region. Conversely, the automotive sector contributes 51% of South Africa's motor exports and supporting 30% of manufacturing employment (Province of the Eastern Cape, 2023).

- **Northern Cape**: The Northern Cape shares borders with Namibia, Botswana, as well as the provinces of Free State, North West, Eastern Cape, and Western Cape. Along its western coast lies a stretch of coastline that meets the Atlantic Ocean. This province is the largest by land at 372 889km² however, is only home to 1.3 million people (Stats SA, 2022). The area is characterized by a hot and arid climate, the region's natural vegetation primarily consists of thornveld. The area is known for its mining industry, mining for various resources including copper, diamonds, precious stones, manganese, zinc, lead, iron ore, and limestone (Britannica, The Editors of Encyclopaedia, 2024).

- **Free State**: The free State borders Lesotho as well as the Northern Cape, North West, Mpumalanga and Gauteng Provinces. The Free state covers an area of 129 825km² and has a population of 2.9 million. This area manly consists of grassland and Karoo vegetation and has a varying climate throughout the province (Free State Government , 2024). This area is dominated by agricultural, mining and manufacturing sectors. Around 90% of the area is under cultivation, while being the world's fifth largest gold producer (Municipalities of South Africa, 2024).

- **Kwa-Zulu Natal**: Kwa-Zulu Natal is located on the East coast of South Africa and borders the Indian Ocean, Swaziland, Mozambique Botswana and the Eastern Cape, Free State and Mpumalanga Provinces. The province covers an area of 94 361km² with the third smallest population of 12.4 million (Stats SA, 2022). This area consists of six biomes including, grassland, savanna, forests, estuaries, freshwater ecosystems and the Indian Ocean coastal belt. The major economic activities include agriculture and manufacturing. Kwa-Zulu Natal is a large exporter of steam coal and sub-tropical fruits (Municipalities of South Africa, 2024).

- **North West**: The North West Province is located in the Northern region of South Africa, and borders the Northern Cape, Free State, Gauteng and Limpopo Province as well as Botswana. The area is around 104 882km² with a total population of 3.8 million (Stats SA, 2022). Mining is the predominant economic activity in the area and produces the most platinum globally. The tourism sector is also very active in this area, with attractions such as Sun City, Pilanesberg National Park, and other nature and game reserves (Municipalities of South Africa, 2024).

- **Gauteng**: The Gauteng Province is the smallest province and borders the Free State, North Wets, Limpopo and Mpumalanga Provinces. Gauteng is the smallest province and covers approximately 1.4% (18 178km²) of South Africa's surface area and has a population of 15 million (Stats SA, 2022). Gauteng contributes over 30% of South Africa's GDP in the form of real estate, finance, manufacturing, business services. The province also has many mineral deposits and mining activity.

- **Mpumalanga**: The Mpumalanga province is located to the east of South Africa and

borders Mozambique, Eswatini as well as the Gauteng, Kwa-Zulu Natal, Limpopo and Free State provinces. Mpumalanga is the second smallest province and covers an area of 76 495km² with a population of 5.1 million. The mining, agriculture, services and manufacturing sectors play a major role in the local economy of Mpumalanga. This area is known for it's coal deposits and coal powered power plants, eMalahleni is the biggest producer of coal in Africa (South African Government, 2024).

- **Limpopo**: The Limpopo province is located to the east of South Africa and borders Mozambique, Zimbabwe, Botswana as well as the North West, Gauteng and Mpumalanga provinces. Limpopo covers an area of 125 754km² with a population of 5.7 million (Municipalities of South Africa, 2024). The mining and agriculture sectors are the main economic sectors in this area. Limpopo is rich in mineral deposits including diamonds, copper, emeralds, magnetite, silicon and mica.

South Africa's GHG emissions and mitigation targets

The Republic of South Africa ratified the United Nations Framework on Convention on Climate Change (UNFCCC) in 1997, which aims to stabilize Greenhouse gas (GHG) concentrations in the atmosphere at a level that would prevent dangerous human-induced interference with the climate system. A GHG inventory was created in 1998 and was updated again in 2004, 2014, 2016, 2019 and 2020 to include new data sets that were gathered over the year and to follow the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Intergovernmental Panel on Climate Change, 2006). During this time South Africa has amended the 2004, National Environmental Management: Air Quality Act (NEM: AQA) which aims to reduce and prevent air pollution as well as creating National Ambient Air Quality Standards (NAAQIS) together with the Minimum Emission Standards, which requires facilities to apply for Atmospheric Emission Licences when conduction specific activity. In 2019 the Carbon Tax Act was implemented and aims to reduce GHG emissions by obligating facilities to pay tax on carbon emissions.

In 2020 the DFFE published the National GHG Inventory Report, South Africa, 2000 – 2020 (Department of Foresty, Fisheries and the Environment, 2022). The report documents the GHG emissions South Africa has emitted over the last 20 years. The report documented that the major GHG emitted in South Africa is Carbon Dioxide (CO_2), followed by Methane (CH_4), Nitrous Oxide (N_2O) and Fluorinated gas (F-gasses). South Africa created it first emission inventory in 1998, it has since been undergoing updates and amendments by following the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National GHG Inventories.

As of 2020 the total amount of 391 993 Gg CO_2 (excl. FOLU) was emitted. Of these emissions around 94.7% were emitted by the energy sector. South Africa still depends greatly on coal powered power stations, with a total of 18 power stations operating in the country over three provinces; 12 are located in Mpumalanga, two in Limpopo and four in Gauteng (Shikwambana,

et al., 2020) (figure 1).

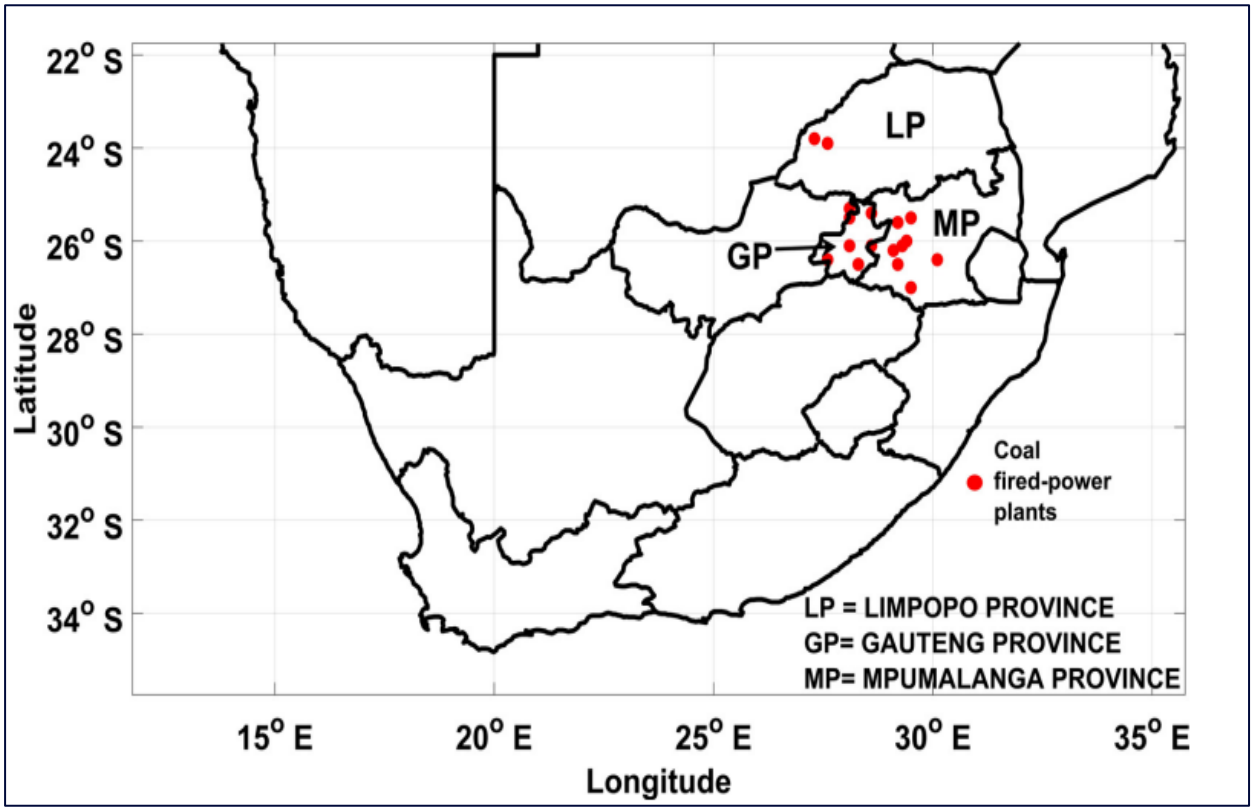

Figure 2: Coal fired- power plant locations in South Africa (Shikwambana, et al., 2020).

The emissions from the energy sector from 2000 to 2020 were documented in the report. Based on the data the emissions peaked in 2009 at a high of 461 135.5 Gg CO_2e and steadily reduced since then, with an estimated low of 379 505.2 Gg CO_2e in 2020 during the COVID-19 pandemic.

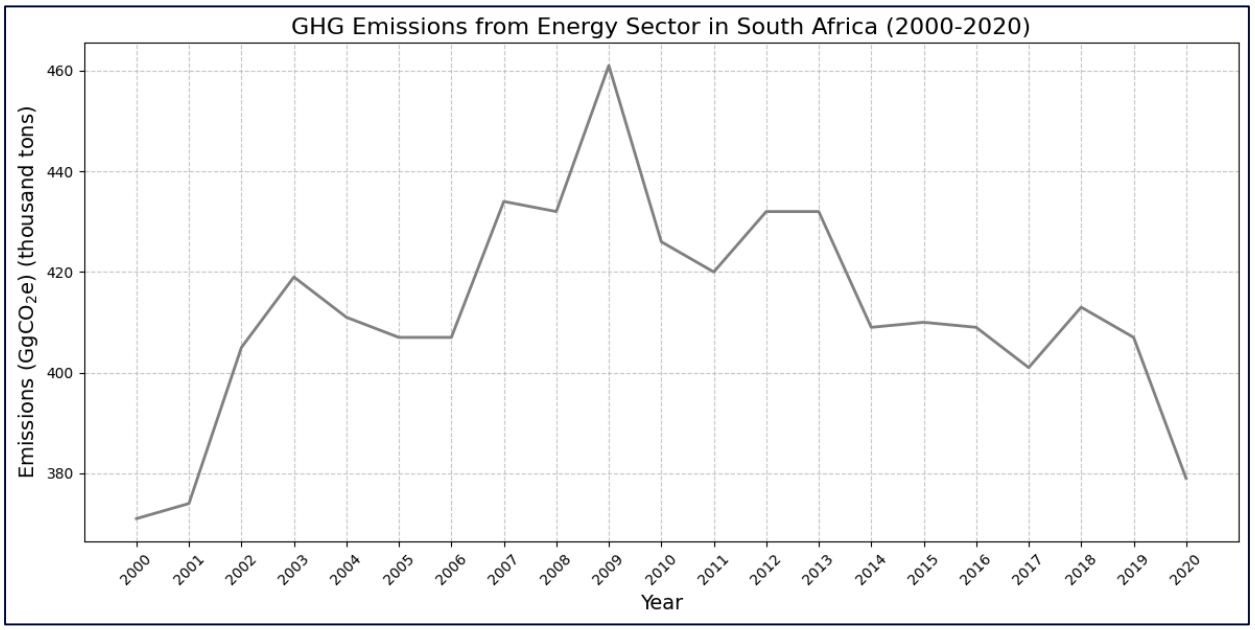

Figure 3: Trends in GHG emissions from the energy sector from 2000 - 2020 (Department of Foresty, Fisheries and the Environment, 2022).

Based on the report N_2O contributed 12.36% to GHG emissions, it was determined that there were 14 267 Gg CO2e (46 Gg N_2O) including FOLU emitted by South Africa in 2020. The contributing sectors include biomass burning and soil management, that contributed approximately 50% of the N_2O emissions in 2020. Other sectors include the livestock and fuel combustions sectors which contributed to approximately 18% of N_2O emissions. Livestock was found to be a major contributor in CH_4 gas and contributed 49.6 % of the total 57 935 Gg CO_2e (2 759 Gg CH_4) in 2020 and had a 2.95% contribution to GHG emissions. F-gas contributed 1.1% of GHG emissions from the aerosols, cooling equipment and fire protection agents.

South Africa submitted their Nationally Determined Contribution (NDC) Under the Paris Agreement in 2021. Targets were created for 2025 to 2030, which includes the reduction of GHG emissions to 350-420 Mt CO_2-eq, while also aiming to reach Net-Zero by 2050 (Republic of South Africa, 2021).

Climate change response in South Africa

South Africa created the National Climate Change Response Policy White Paper (NCCRP) that was approved in 2011 and published as a White Paper in the government Gazette (GNR. 757). The NCCRP sets out multiple objectives to effectively mitigation and adaptation to potential climate change impacts. By implementing climate consideration into development and planning it aims to ensure sustainable development and building economic, ecological and social resilience as well as contributing to global efforts to reduce greenhouse gas emissions.

In 2022 the Climate Change Bill was proposed and was approved in 2023. The bill is in the process of various public participation processes to become an act. The objectives of this bill are to:

(a) *"provide for a coordinated and integrated response by the economy and society to climate change and its impacts in accordance with the principles of cooperative governance;*

(b) *provide for the effective management of inevitable climate change impacts by enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic and environmental resilience and an adequate national adaptation response in the context of the global climate change response;*

(c) *make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system;*

(d) *to ensure a just transition towards a low carbon economy and society considering national circumstances;*

(e) *give effect to the Republic's international commitments and obligations in relation to climate change; and*

(f) *protect and preserve the planet for the benefit of present and future generations of humankind."*

Chapter 3 of the bill discusses the Climate Change Response for province and municipalities and indicates that provinces and municipalities have to identify climate change needs as well as formulate steps on addressing the needs identified.

Chapter 5 of the inidicates that there will be a national GHG trajectory to which all levels of government will be expected to contribute towards. The bill discusses the expectations regarding GHG emissions and emission targets, which includes the creation of GHG emissions inventories to identify the various sectoral emissions. This will assist in emission target setting through policies and programmes both nationally and sub-nationally.

Rationale for provincial climate change response situational analysis

The Initiative for Climate Action Transparency (ICAT) project aims to assist provinces in South Africa to use and implement Climate Change mitigation systems and tools to support the implementation of its NDC. The project aims to build capacity within and provide support to provinces to develop their GHG inventories, to set emission reduction targets and to track mitigation actions. The provincial scoping analysis is essential for tailoring training materials to the specific needs and circumstances of each province. By understanding the unique positions, challenges, and requirements of each province, training can be customised to address those

specific factors effectively. This approach increases the likelihood of successful implementation of climate change actions by ensuring that the training is relevant, practical, and targeted to the areas where it is most needed. Overall, the scoping activity serves as a foundation for designing training programs that are impactful and beneficial for each province's efforts in addressing climate change.

OBJECTIVES OF THE PROVINCIAL SITUATIONAL ANALYSIS

The specific objectives of the analysis were to:

1. Assess the current state of climate-related policies, strategies, and action plans in the province, including those related to emissions mitigation, adaptation, clean energy, and waste management.
2. Utilise the findings and outputs of the scoping analysis to customize training programs and identify priority provinces for targeted capacity-building initiatives focused on tracking climate change actions.
3. Investigate existing or planned actions within the provinces aimed at reducing GHG emissions, including any targets set for emission reduction and the status of these actions.

SCOPING AND ANALYSIS METHOD

A methodology was employed to comprehensively collect data on policies, strategies or plans in place that are directly or indirectly related to climate change to have an in-depth understanding of climate actions within the provinces. A detailed questionnaire was created, and reviewed by the DFFE, as indicated in Annexure 1. Each Province was asked to complete the questionnaire.

The questionnaire covers various topics including climate policies, actions, GHG inventories, as well as an understanding of institutional arrangement to compile emission inventories. It was also important to understand any gaps and challenges provinces face when developing inventories, creating emission targets, and the implementation of MRV systems. In addition to the questionnaire data, additional research was conducted to identify other policies, strategies or plans related to climate change in each province.

Qualitative data analysis techniques were employed to identify common themes and variations among provinces, with particular attention given to climate policies, GHG inventory procedures, emission reduction actions, and stakeholder engagement. Findings were synthesized in this report to highlight key insights and recommendations, emphasizing overarching challenges and opportunities for improving provincial climate action. The feedback provided by provinces will assist in identifying provinces for targeted training.

RESULT AND FINDINGS

GHG INVENTORY PREPARATION AND DEVELOPMENT

The provinces were asked to provide a summary of their GHG inventory developments and improvements. Additionally, they were asked to provide information on any tools used to create inventories as well as the gaps, challenges, and institutional arrangements for complaining GHG inventories.

The status of the GHG inventories for the province is shown in Figure 4.

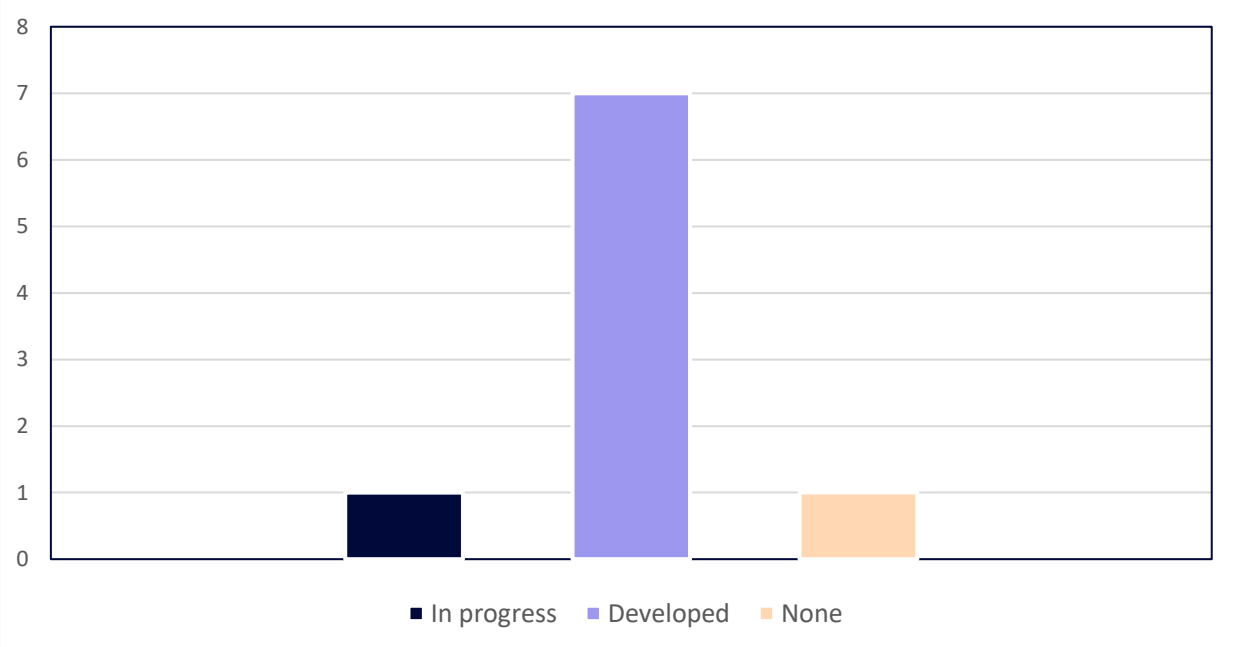

Figure 4: Status of GHG inventories in the provinces.

In 2012, the **Free State** initiated an emissions inventory, yet it remained incomplete due to insufficient data availability. A revised inventory is due for the 2024/2025 financial year. **Mpumalanga** established its inventory in 2018, continually updating it with newly acquired data, as initial key activity data was not initially added. K**wa-Zulu Natal** introduced its inventory in 2021, with annual updates however, the province faces capacity challenges in maintaining it. The **Western Cape** implemented an inventory in 2018, updated it in 2022, and is scheduled for

further updates in the 2024/2025 financial year. **Limpopo** and the **North West** have integrated inventories into their Climate Change strategies. The **Northern Cape** has developed their inventory but is currently in the capacity building process to update the inventory. **Gauteng** is currently in the inventory development phase, while the **Eastern Cape** has not yet initiated any inventory efforts.

Provinces do not, at this stage, produce multiple inventories. Provinces produce an inventory for a year and do not have a time series of data or do recalculations as is done in the national inventory. Provinces certainly do not do an inventory every two years. Inventories are done if and when resources are available.

Table 1: Status of GHG inventories in each province.

Provinces	Latest inventory	Updates
Gauteng	In progress	N/A
Mpumalanga	2018	Needs updating as detailed data from key activities were not included
North West	Recently completed as part of Climate Change Strategy	N/A
Western Cape	2022 (for year 2018)	To be updated in 2024/25 financial year
KwaZulu Natal	2021	Updated annually
Eastern Cape	None	
Northern Cape	Developed	Developing capacity to update
Free State	2012	Not complete due to lack of data
Limpopo	Recently completed as part of Climate Change Strategy	N/A

It was noted that all nine provinces indicated that there were no formal institutional arrangements for the GHG inventory compilation.

All provinces that have or are preparing a GHG inventory utilise either the 2006 IPCC Guidelines (Free State) or the Global Protocol for Community-Scale GHG Inventories (Western Cape, Gauteng) methodologies to compile their inventories. Provinces make use of a variety of tools

to create their greenhouse gas (GHG) inventories:

- City Inventory Reporting and Information System (CIRIS) Tool is being used by Gauteng;
- Excel spreadsheets are being utilised by Kwa-Zulu Natal;
- Climate Change Information System is used by Mpumalanga.

Table 2: The main gaps, constraints and challenges in term of GHG inventory development.

Provinces	Data Collection Challenges	Capacity Building and Training	Resource Constraints	Data Accessibility	Policy Clarity and Funding
Gauteng	x				
Mpumalanga		x	x		x
NW			x		x
WC	x	x		x	
KZN				x	
EC		x			
NC		x	x		x
Free State	X			x	
Limpopo			x		

The provinces are at different stages in their greenhouse gas (GHG) inventory processes, each facing similar challenges and utilizing distinct tools. Capacity building and resource constraints are significant challenges, particularly for the Eastern Cape, which lacks an established inventory. The primary challenge in developing such an inventory is due to a lack of capacity and training. This project is a key intervention towards providing training and assistance towards the provincial GHG inventories.

CLIMATE RELATED DEVELPMENTS IN EACH PROVINCE

A comprehensive inquiry into the climate-related policies, strategies, and plans of South Africa's provinces sheds light on the nation's preparedness and commitment to addressing climate change. The provinces were queried regarding their climate-related policies, strategies, and plans, whether implemented, in draft, or under development. Across all nine provinces, a range of two to seven plans were found to be implemented.

The **Eastern Cape** is one of two provinces to have a climate action plan namely the "Eastern Cape Climate Change Adaptation Action Plan 2017". The action plan focuses on adaptation options for

various sectors while looking at reducing exposure and vulnerability to climate impacts. The action plan identified the following vulnerable sectors:

- Biodiversity and Ecosystems;
- Human settlements;
- Disaster Risk Management (DRM) ;
- Water resources ;
- Agriculture and Food Security;
- Human Health;
- Coastal and Marine zones;
- Transport and Public Infrastructure;
- Manufacturing.

Th plan further provided criteria for creating adaptation response actions, which involves assessing the expected reduction of climate risks, implementation costs, potential co-benefits, feasibility considering available capacity, and ensuring avoidance of unintended negative consequences.

Multiple short, medium and long-term goals, ranging from one to five year, were created for vulnerable sectors identified. These goals include the timeline, budget, locale, and scale of the goal. Since the report was published in 2017, all the goals should've been reached by 2022.

Mpumalanga Province

The Mpumalanga Province, recognized for its significant industrial activities and reliance on coal-powered power stations, has the highest number of climate-related plans. Currently, the province has six plans in the implementation phase, with an additional four plans in the draft stage and two in development. The implemented the following plans: Mpumalanga Climate Change Adaptation Strategy with Implementation Plan 2016, Mpumalanga Climate Change Mitigation Strategy with Implementation Plan and Greenhouse Gas Inventory Report 2022, Mpumalanga Green Economic Development Plan, Mpumalanga Spatial Development Framework, Mpumalanga Human Settlements, has Informal Settlements Framework and Master Plan and the Mpumalanga Just Transition Phase One Plan 2023 – 2027.

The Mpumalanga Just Transition Phase One Plan 2023 – 2027, outlines the need and initial investment needed for the country to move towards a low carbon economy to align with the NDC submitted to the UNFCCC in 2021. It was determined that South Africa would need approximately R1.5 trillion over a five-year period. The plan further discusses the various

challenges in the process.

Western Cape Province

The Western Cape has a total of eight strategic plans with climate change actions being implemented, whilefive plans are in the draft stage. The Western Cape Climate Change Response Strategy: Vision 2050 underwent finalisation in 2022, with subsequent updates in 2023. Additionally, several sector-specific strategies, such as the Growth for Jobs Strategy (2023), Air Quality Management Plan, Integrated Waste Management Plan, SmartAgri Programme, and Biodiversity and Coastal Plans, integrate considerations for climate change. These initiatives collectively aim to address climate challenges while fostering sustainable development across various sectors in the Western Cape region.

The "Western Cape Climate Change Response Strategy: Vision 2050" with the first revision done in March of 2023. This strategy addresses the global climate change emergency and the importance of using a scientific bases to highlight to need for a green economy.

The following objective were identified in the report:

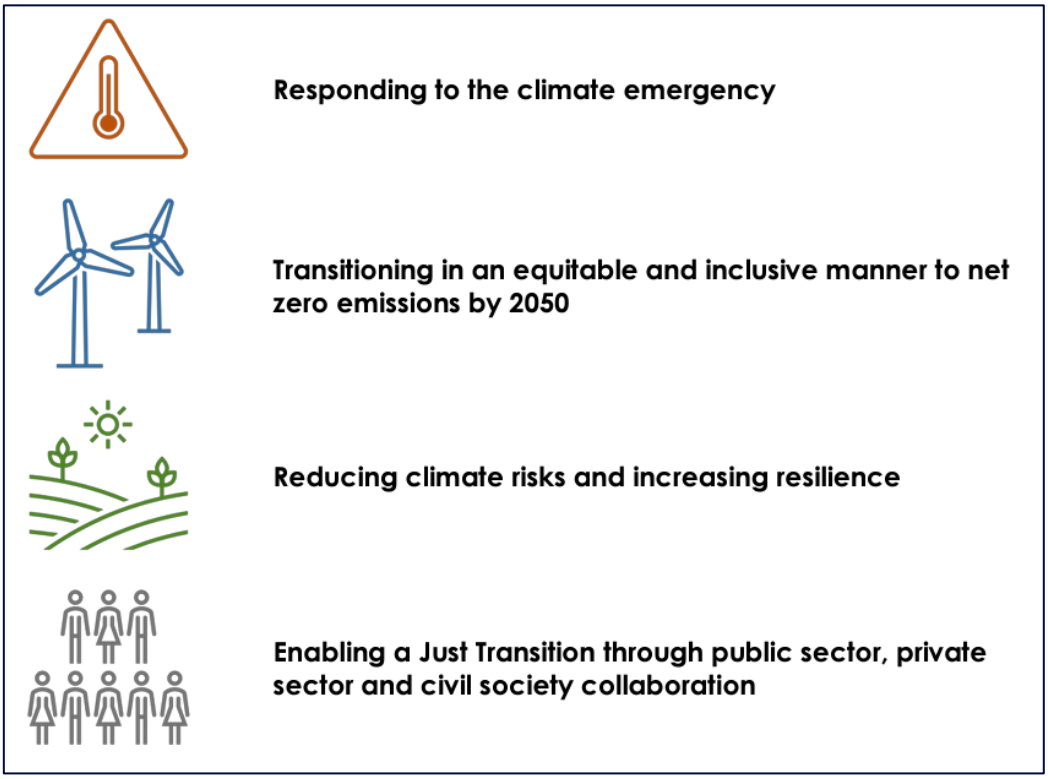

Figure 5: Objective of the Western Cape Climate Change Response Strategy: Vision 2050

The report discusses how these objectives will be reached in detail, adding the institutional

arrangements and goals for the future climate in the Western Cape. The strategy report continues to list various programmes and response actions required by the province from 2023-2025 and 2025 – 2050. The programmes include that include response actions are:

- Adaptation Plan
- Disaster Management
- Community Resilience
- Resilient Built Environment
- Transport Sector
- Coastal Management
- Ecosystem-based Adaptation & Nature based Solutions
- Water security
- Net Zero by 2025
- Green and Blue Carbon
- Low-carbon Economy
- Energy Security
- Waste Sector
- Agriculture
- Health Sector
- Governance
- Climate Finance
- Monitoring, Evaluation and Review
- Climate Change Communication and Awareness
- Skills Development

The strategy discusses the immediate action to be implemented which includes the Western Cape Municipal Energy Resilience Initiative, Sustainable Water Management Plan, Smart Agri Plan, government-led Electric Vehicle fleet transition, 2050 Greenhouse Gas Emissions Mitigation Pathway, Air Quality Management Plan, Integrated Waste Management Plan, Risk Assessments in Disaster Management Plan(s), Provincial Biodiversity Strategy and Action Plan, Ecological Infrastructure Investment Framework, Biodiversity Spatial Plan and Protected Area Expansion Strategy, Sustainable Public Procurement Programme and public employment

programmes, Global Green and Healthy Hospitals and Building Modernisation Programme.

North West Province

The **North West** has a total of four plans in the implementation phase, with one in the draft stage and one whose development is yet to be initiatieated. The "North West Climate Risk and Vulnerability Assessment Report" (Urban Earth, 2021) was done in 2021. The report discussed the various impacts, exposure, sensitivity and adaptive capacity of climate change on a number of sectors in the province, including ecosystems, rural and urban livelihoods, agriculture, tourism, mining, water supply, energy supply, transport, waste management, human health and disasters resulting from extreme weather. The assessment found that 58% of the sectors have a high level of concern while the remainder are medium concerns (figure 10). This assessment forms the bases on the Climate Change Response Strategy that is being developed. Alongside this, a Integrated Waste Management Plan is being developed with the Vulnerability Assessment and a GHG Inventory and Air Quality Management Plan completed.

Sector	Level of Concern
Ecosystems	High Concern
Rural Livelihoods	High Concern
Urban Livelihoods	Medium Concern
Agriculture	Medium Concern
Tourism	Medium Concern
Mining	Medium Concern
Water Supply	High Concern
Energy Supply	Medium Concern
Transport	High Concern
Waste Management	High Concern
Human Health	High Concern
Disasters Resulting from Extreme Weather	High Concern

Figure 6: Level of concern per sector (Urban Earth, 2021).

Limpopo has implemented four plans; the Limpopo Green Economy Strategy and Limpopo Provincial Air Quality Management Plan were created in 2013. The Green Economy Strategy created short-, medium- and long-term goals that focus on sustainability, water and waste management, clean energy, agriculture, green building, transport and green municipalities. Long

term goals are set to be achieved in 2050.

A Provincial Waste Management Plan and the Provincial Climate Change Response Strategy 2016 – 2020, was created in 2016. The objective of the Climate Change Response Strategy was to "outlines the initial set of key objectives to be taken over the next four years and that can be adjusted on an ongoing basis as new ideas and solutions are developed" (Limpopo Provincial Government, 2016). Based on the conclusion the strategy was to be monitored quarterly to determine the progress on the various targets.

The Green Economy Strategy looks at provincial government and private sector to move from a carbon intensive to a green economy, the Provincial Air Quality Management Plan, and the Provincial Waste Management Plan.

Gauteng has a total of four plans implemented. Namely the Gauteng City Region Over-Arching Climate Change Response Strategy and Action Plan 2020, Gauteng Air Quality Management Plan (AQMP), Gauteng Integrated Waste Management Plan 2020 and beyond and the Gauteng Environmental Sustainability Report 2022.

The Gauteng City Region Over-Arching Climate Change Response Strategy and Action Plan 2020 created the following goals for the report (figure 11):

Figure 7: Four goals of climate change response in Gauteng (Gauteng Province, 2020).

The strategy includes various targets and goals throughout the report, including the carbon emission reduction targets, abatement goals, and desired adaptation outcomes. Section six of the strategy discusses the Action Plan of Gauteng where 11 Response Programmes were created, each focusing on the following sectors: Natural Resources, Agriculture & Agro-Processing, Disaster Risk Reduction and Management, Water Security, Commercial and Institutional Buildings, Human Settlements, Energy Supply, Industry & Mining, Transport, Waste Management and Health. Each programme has priority projects, impacts, mitigation targets, timeframes, targets, role players and allocated finances. The strategy is planned to be updated every five years, with the next update being in 2025 (Gauteng Province, 2020).

KwaZulu-Natal recently created the KZN Human Settlement Disaster Management Policy 2023 due to the various disasters that affected the area. The disasters had natural and anthropogenic origins including floods, social unrest and the COVID-19 pandemic. This policy aims to provide structure to disaster responses, increase the disaster response time and to increase resilience. Kwa-Zulu Natal has also created an Air Quality Management Plan (AQMP), and an Integrated

Waste Management Plan (IWMP).

Kwa-Zulu Natal Climate Change Strategy

In the **Northern Cape**, a total of three plans have been implemented, comprising the Northern Cape Green Hydrogen Project, Northern Cape Waste Minimisation Programme (ISP) and the Northern Cape Waste Minimisation Programme (ISP).

Lastly, the **Free State** has implemented two plans and a climate change strategy. The Climate Change Adaptation, Response Strategy for Free State was developed in 2017. The objectives outlined involve conducting a comprehensive Climate Risk and Vulnerability Assessment for the Free State Province spanning the near and medium term (2020-2050). The assessment discusses the various projected climate variabilities and the potential sensitivity and vulnerability for water sources, agriculture, ground water availability, mining, transport, energy, human settlements, and human health followed by various adaptation and mitigation options. The Free State also created the Free State Air Quality Management Plan.

A collective effort from all provinces to address climate concerns was evident, as each province has implemented a climate-related plan. The Climate Change Bill states that two years after undertaking the climate change response implementation plan a climate change response implementation plan should be developed. However, it is noteworthy that only a few provinces are actively engaged in developing new plans.

Table 3: Province strategy and action plans completed (green) and in development (yellow).

Province	Strategy or action plan
Mpumalanga	Mpumalanga Climate Change Adaptation Strategy with Implementation Plan
	Mpumalanga Climate Change Mitigation Strategy with Implementation Plan and Greenhouse Gas Inventory Report
	Mpumalanga Climate Change Response Database (MCCRD)
	Mpumalanga Just Transition Phase One Plan
	Mpumalanga Green Economic Development Plan
	Mpumalanga Spatial Development Framework
	Mpumalanga Human Settlements, has Informal Settlements Framework and

	Master Plan
	Draft Mpumalanga Infrastructure Master Plan
	Draft Mpumalanga Integrated Waste Management Plan
	Draft Mpumalanga Air Quality Management Plan
	Draft Nkomati-Usuthu Catchment Management Climate Change Strategy
Gauteng	Gauteng City Region Over-Arching Climate Change Response Strategy and Action Plan 2020
	Gauteng Air Quality Management Plan (AQMP)
	Integrated Waste Management Plan
	Gauteng Environmental Sustainability Report 2022
North West	North West Climate Risk and Vulnerability Assessment (CRVA)
	North West GHG Inventory
	North West Air Quality Management Plan
	Draft North West Climate Change Response Strategy
	North West Integrated Waste Management Plan
Kwa-Zulu Natal	Kwa-Zulu Natal Climate Change Strategy
	Kwa-Zulu Natal Human Settlements Disaster Management Policy
	Kwa-Zulu Natal Air Quality Management Plan
	Kwa-Zulu Natal Integrated Waste Management Plan
Free State	Free State Climate Change Adaptation Strategy
	Free State Green Economy Strategy
	The Free State Air Quality Management Plan
Limpopo	Limpopo Provincial climate change response strategy 2016-2020
	Limpopo Green Economy Strategy 2013
	Limpopo Provincial Air Quality Management Plan 2013
	Provincial Waste Management Plan 2016
Easter Cape	Eastern Cape Climate Change Response Strategy 2011
	Eastern Cape Climate Change Adaptation Action Plan 2017
	Air Quality Management Plan for The Eastern Cape Province
	Eastern Cape Provincial Integrated Waste Management Plan (PIWMP)
Northern Cape	Northern Cape Green Hydrogen Project
	Northern Cape Waste Minimisation Programme (ISP)
	Northern Cape Provincial Climate Change Response Strategy
	Northern Cape Waste Minimisation Programme (ISP)
Western Cape	The Western Cape Climate Change Response Strategy: Vision 2050
	Growth for Jobs Strategy (2023)
	Air Quality Management Plan
	Integrated Waste Management Plan
	Smart Agri Programme
	Biodiversity and Coastal Plans
	Western Cape Green Economy Strategy Framework

	Western Cape Sustainable Water Management Plan 2017 — 2022
	Adaptation Pathways exercise
	GHG Inventory for the Western Cape
	Short-Lived Climate Forcers Strategy for the Western Cape
	Western Cape Integrated Resource Plan (IRP) 2019
	Draft Western Cape Protected Area Expansion Strategy 2021

EMISSION TARGETS AND TARGET SETTING

This section aimed to identify both planned and existing actions undertaken by provinces to reduce greenhouse gas (GHG) emissions, together with their progress status. Additionally, to know whether provinces have established emission targets and, if so, the specifics of these targets. Lastly, it aimed to uncover the main challenges provinces face in setting emission reduction targets.

The majority of the provinces are in the development phase in terms of GHG emission reduction actions, with only Mpumalanga having operational actions in place. These include ambient monitoring, waste programmes, energy efficient programmes and the implementations of a Climate Change Information System. The other provinces are currently in the process of developing emission reduction plans for multiple sectors, including energy, waste, transport, and ecosystem-based adaptation.

Of the nine provinces, five have established emission reduction targets. Mpumalanga has achieved a 3% reduction in emissions, while the Western Cape aims to achieve net-zero emissions by 2050. Conversely, provinces such as the North West, KwaZulu-Natal, Northern Cape, and Limpopo have not set any specific emission reduction targets.

Provinces	Inventory Data and Monitoring Methods	Capacity Building and Training	Resource Constraints	Challenges with Target Setting	Inability to Assess Mitigation Potential
Gauteng	x	x			
Mpumalanga		x			
NW		x	x		
WC				x	
KZN	x	x			
EC		x			
NC			x		
Free State	Unsure				
Limpopo					X

shows the challenges which provinces have when it comes to setting emission reduction targets.

Table 4:Main gaps and challenges in emission target setting.

Provinces	Inventory Data and Monitoring Methods	Capacity Building and Training	Resource Constraints	Challenges with Target Setting	Inability to Assess Mitigation Potential
Gauteng	x	x			
Mpumalanga		x			
NW		x	x		
WC				x	
KZN	x	x			
EC		x			
NC			x		
Free State	Unsure				
Limpopo					X

Based on the feedback provided by the provinces, the major challenge in setting emission reduction targets is capacity building and training followed by resource constraints and inventory data (table 4i). Based on the individual feedback, each province identified a unique combination of challenges.

MONITORING AND TRACKING MITIGATION ACTIONS

The following section aimed to identify the Monitoring, Reporting and Verification (MRV) systems present in each province as well as the tools, arrangements and challenges of MRV systems. It was found that a minority of provinces had tools in place to track mitigation activities.

Gauteng makes use of manual reporting while the **Free State** makes use of the Climate Change Forum.

Mpumalanga uses their Climate Change Information Systems that is publicly available and used for tracking interventions on climate response efforts, which include policies, plans, strategies, projects and research. The Climate Change Response Database (Mpumalanga Province, 2024) was created, which in the form of a website that requires viewers to registers with an email address and password.

The website provides multiple platforms to access data reports, search for data and a project update section. The data report section (figure 7) provides access to graphs indicating the estimated budget that has been spent on adaption and mitigation since 2001 as well as a finding source breakdown, project counts, sector budgets for mitigation and adaptation, as well as the

number of operational projects.

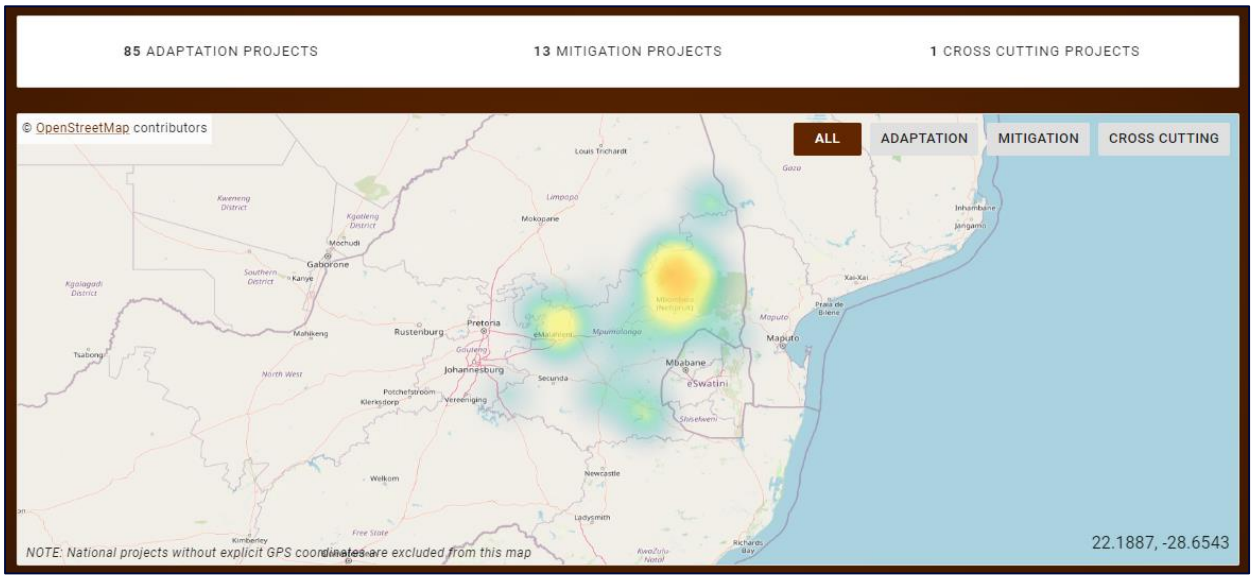

Figure 8: The data report web page indicating the location and number of projects (Mpumalanga Province, 2024).

The data search section of the website features a project filter enabling users to search for projects based on criteria such as cost, sector, and type of mitigation or adaptation. Within the energy sector, multiple projects are available for review, each accompanied by a document detailing its status, start and end dates, description, funding details, and location. However, it's noted that while many projects include progress report updates, some lack reports tracking their specific actions and outcomes.

The **Free State** uses the Climate Change Forum, it was noted that five of the nine provinces indicated that they had were not using any tool to manage climate related data.

Table 5: The main gaps in implementing or developing MRV systems within the provinces.

Province	Tools
Gauteng	Manual reporting through Climate Change Project Register – planning on going online
Mpumalanga	MP Climate Change Information System
North West	None
Western Cape	None currently but plan to update M&E system to track targets
KwaZulu Natal	None
Eastern Cape	None

Northern Cape	None
Free State	Climate Change Forum
Limpopo	None

When it came to institutional arrangements for MRV of climate-related activities, only the Western Cape had institutional arrangements in place and was the only province that indicated that capacity building on GHG inventories and MRV systems had taken place in the last two years.

CAPACITY BUILDING AND STAKEHOLDER ASSISTANCE

This section aimed to identify the main stakeholders assisting provinces with MRV and GHG inventories, as well as to inquire about capacity-building activities related to GHG inventory, MRV, and mitigation target setting.

Based on the feedback received, stakeholders assisting provinces with GHG inventories and MRV varied from international stakeholders to local, provincial, and national government entities. Some provinces also mentioned receiving assistance from industries and the private sector. However, it was noted that the North West, Northern Cape, and Limpopo provinces do not have any stakeholders assisting them in this regard.

When asked about any capacity building activities that took place over the last two years, only the Western Cape had received any capacity building workshops. Provinces were asked to rank the GHG inventory training, target setting training and climate action tracking in order of importance. Six of the provinces rated that GHG Inventory training was a priority for them, while Western Cape, Limpopo and KwaZulu Natal expressed interest in training on target setting, while three provinces indicated target setting was their main priority (table 5). Seven provinces listed Tracking climate actions as their second priority.

Table 6: Province capacity building priority.

Province	GHG Inventory	Target setting	Tracking actions
Mpumalanga	1	2	3
Eastern Cape	1	2	3

Northern Cape	1	3	2
Free State	1	3	2
Gauteng	1	3	2
North West	1	3	2
Western Cape	3	1	2
KwaZulu Natal	3	1	2
Limpopo	3	1	2

Based on the feedback provided by the provinces the following provinces were identified for in-person training: Gauteng, Western Cape and potentially Mpumalanga and KZN. The individualised training will be focused on the implementation of the CAAT tool.

CONCLUSION

In conclusion, the assessment of the various provinces in South Africa provided insight into the unique changes faced by each province. While each province has implemented a climate change strategy, very few were developing new strategies. Provinces such as Mpumalanga addressed various aspects of climate change that include adaptation, and mitigation strategies while the Western Cape expressed their goal to reach Net Zero by 2050.

Despite some provinces making progress on developing emission targets, others indicated challenges, such as resource constraints, capacity building and data availability issues. Furthermore, many provinces do not have MRV systems in place due to budget and capacity within the provinces. Furthermore, the limited capacity building activities reported by provinces highlight the importance of prioritizing skill development, particularly in GHG emission inventories and target setting. Moving forward, concerted efforts are needed to address these challenges, promote collaboration, and build capacity across all provinces to accelerate climate action and achieve sustainable development goals.

The insights gathered from the assessment will serve as a crucial foundation for developing training materials for each province based on their unique needs and challenges.

REFERNCES

References

Britannica, The Editors of Encyclopaedia, 2024. *Northern Cape.* s.l.:Encyclopedia Britannica.

Britannica, 2024. *Western Cape.* s.l.:Encyclopedia Britannica.

Department of Foresty, Fisheries and the Environment, 2022. *National GHG Inventory Report South Africa 2000 - 2020,* s.l.: s.n.

Free State Government , 2024. *The Free State.* [Online]
Available at: https://www.freestateonline.fs.gov.za/
[Accessed 17 April 2024].

Intergate Immigration, 2024. *South African Provinces.* [Online]
Available at: https://www.intergate-immigration.com/blog/south-african-provinces/
[Accessed 22 April 2024].

Intergovernmental Panel on Climate Change, 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories.* [Online]
Available at: https://www.ipcc-nggip.iges.or.jp/public/2006gl/
[Accessed 22 April 2024].

Limpopo Provincial Government, 2016. *Provincial CLimate Chnage Response Startegy 2016-2020,* s.l.: Dpartment of Economic Development, Environment and Toursim.

Mpumalanga Province, 2024. *Mpumalanga Climate Change Response Database.* [Online]
Available at: https://mccrd.environment.gov.za/
[Accessed 19 April 2024].

Municipalities of South Africa, 2024. *Provinces.* [Online]
Available at: https://provincialgovernment.co.za/
[Accessed 17 April 2024].

Province of the Eastern Cape, 2023. *THE EASTERN CAPE – HOME OF LEGENDS.* [Online]
Available at: https://ecprov.gov.za/the-eastern-cape.aspx#:~:text=The%20province%20produces%20half%20of,mostly%20by%20the%20automotive%20sector.
[Accessed 11 April 2024].

Republic of South Africa, 2021. *South Africa: First Nationally Determined Contribution Under the Paris Argeement ,* s.l.: s.n.

Shikwambana, L., Mhangara, P. & Mbatha, N., 2020. *Trend analysis and first time observations of sulphur dioxide and nitrogen dioxide in South Africa using TROPOMI/Sentinel-5 P data,* s.l.: International Journal of Applied Earth Observation and Geoinformation.

South African Government, 2024. *Provinces.* [Online]

Available at: https://www.gov.za/provinces
[Accessed 11 April 2024].

Stats SA, 2022. *Census 2022.* [Online]
Available at: https://census.statssa.gov.za/#/province/3/2
[Accessed 17 April 2024].

Turpie, J. K., Letley, K. G., Weiss, J. & Schmidt, K., 2020. Towards a method for accounting for ecosystem services and asset value: Pilot accounts for KwaZulu-Natal, South Africa, 2005-2011. *One Ecosytem,* Volume 7.

Urban Earth, 2021. *North West Climate Risk and Vulnerability Assessment Report,* s.l.: North West Province.

Wenger, M., 2023. *Provincial Economic Review and Outlook 2023 ,* s.l.: Western Cape Government Provincial Treasury.

Annexure 1- Questionnaire

Questions
Question 1: What climate-related policies, strategies and action plans have been developed in the province? These could include those related to emissions mitigation, adaptation, clean energy, waste management.
Question 2: Are there any specific policies, strategies and actions plans currently in development to enhance climate action and target achievements?
Question 3: Please provide a brief overview of the GHG inventory development and improvement process in your province to date?
Question 4: What are the institutional arrangements for provincial GHG inventory compilation?
Question 5: Does the province have any formal data collection procedures or tools for gathering inventory-related data? If yes please elaborate.
Question 6: What tools (if any) are used for the compilation of the GHG Inventory?
Question 7: What are the main gaps, constraints and challenges in terms of the GHG inventory development?
Question 8: Describe existing or planned actions in the province that seek to reduce greenhouse gas emissions, as well as their current status (e.g. operating, in construction, decommissioned, pilot phase)
Question 9: Does your province have any target to reduce emissions or intention to develop targets? Please provide information on what these targets are.
Question 10: What are the main gaps and challenges in terms of target setting?
Question 11: Does the province have an MRV system in place for tracking greenhouse gas emissions, mitigation action, and progress on meeting targets?
Question 12: What tools are being utilised for managing climate-related data and for tracking mitigation activities within your province?
Question 13: What are the institutional arrangements for MRV of climate-related activities in your province?
Question 14: What are the main gaps and challenges in terms of developing and/or implementing a MRV system?
Question 15: Who are the stakeholders and experts assisting the province in terms of GHG

inventories and MRV?
Question 16: What GHG inventory/MRV/mitigation target setting capacity building activities have taken place in the province in the last 2 years?
Question 17: Please rank the following capacity building activities in order of importance for the province: (a) GHG inventory training, (b) training on target setting, and (c) training on MRV.