



CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

CITY OF CAPE TOWN

CLIMATE CHANGE POLICY (POLICY NUMBER 46824)

APPROVED BY COUNCIL : 27 JULY 2017
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JULY 2017

1. Contents

1.	Contents.....	1
2.	Definitions, acronyms and abbreviations.....	3
2.1.	Definitions.....	3
2.2.	Acronyms and abbreviations.....	5
3.	Context setting.....	6
3.1.	Problem statement.....	6
3.2.	Need for a climate change policy.....	7
3.3.	History of climate change strategy and policy in the City.....	8
4.	Framing the City of Cape Town Climate Change Policy.....	10
4.1.	Anticipated impacts of projected climatic changes.....	10
4.2.	GHG emissions context for Cape Town.....	12
4.3.	Current implementation of response action to increase climate change resilience and decrease emissions.....	14
4.4.	Policy parameters / scope.....	15
5.	Vision and desired outcomes.....	16
5.1.	Vision.....	16
5.2.	Long-term desired outcomes.....	16
6.	Principles and directives.....	17
6.1.	Factor in long-term and cross-sectoral impacts and benefits in planning and decision-making.....	17
6.2.	Improve resilience and reduce vulnerability.....	19
6.3.	Promote a lower carbon approach.....	20
6.4.	Support well-functioning ecosystems that enable service delivery and reduce risk.....	22
6.5.	Promote socio-economic benefits and their equitable distribution.....	23
6.6.	Ensure climate compatible urban design and infrastructure development and maintenance.....	24
6.7.	Promote and support behaviour change in all citizens.....	25
7.	Strategic alignment.....	26
8.	Regulatory context.....	26
9.	Partnerships and collaborative working.....	28
9.1.	International agreements, conventions and membership.....	28
9.2.	National, provincial and local partnership approach.....	30
10.	Implementation framework.....	31
11.	Monitoring and evaluation.....	32
11.1.	Use of appropriate tracking tools.....	32
11.2.	Integration with IDP and other tools.....	32
11.3.	Annual progress reporting to committees, Council and external stakeholders.....	33

11.4.	Regular policy review	33
12.	Notes	33
13.	Annexure A: Projected Impacts	
14.	Annexure B: Work undertake to date by the City of Cape Town	
15.	Annexure C: Strategic intent / alignment	
16.	Annexure D: The regulatory context: National legislation that provides a guiding framework for the Climate Change Policy	
17.	Annexure E: Bibliography	

2. Definitions, acronyms and abbreviations

2.1. Definitions

For the purposes of this Climate Change Policy, the following definitions apply:

“Adaptation” means adjustment in natural systems or human society in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.¹

“Adaptive capacity” means the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.²

“Anthropogenic” means caused by human activity.

“Carbon footprint” means the total amount of greenhouse gases that are emitted into the atmosphere each year by a person, family, building, organization, or company. A person or entity’s carbon footprint includes greenhouse gas emissions from fuel that an individual burns directly, such as by heating a home or driving in a car. It also includes greenhouse gases that come from producing the goods or services that the individual uses, including emissions from power plants that make electricity, factories that make products, and landfills where rubbish gets sent.³

“Carbon sequestration” means the process by which carbon sinks remove carbon dioxide (CO₂) from the atmosphere.

“Carbon sink” means a natural reservoir (of vegetation, soil or water) that accumulates and stores some carbon-containing chemical compound for an indefinite period.

“City” means the City of Cape Town, a municipality established by the City of Cape Town Establishment Notice No. 479 of 22 September 2000, issued in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998), or any structure or employee of the City acting in terms of delegated authority.

“Climate change” means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.⁴

“Council” means the Municipal Council of the City.

“Ecological infrastructure” means naturally functioning ecosystems that deliver valuable services to people. Ecological infrastructure is the nature-based equivalent of built or engineered infrastructure. Ecological infrastructure is often also referred to as green infrastructure.

“Ecosystem Goods and Services” (EG&S) are the environmental benefits resulting from physical, chemical and biological functions of healthy ecosystems and include tangible goods produced

¹ UNFCCC. 2014.

² IPCC. 2014: 118.

³ United States Environmental Protection Agency

⁴ United Nations. 1992: 3.

from ecosystems (e.g. food, materials), and the material and non-material benefits provided by ecosystem processes (e.g. clean air and water)

“Exposure” means the presence of people, livelihoods, species or ecosystems, environmental functions, services, resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected by a stressor.⁵

“Fossil fuel” means organic materials formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust over hundreds of millions of years.⁶

“Green engineering” means engineering that uses natural systems or attempts to replicate natural systems for engineering purposes

“Green space” means an area of grass, trees, or other vegetation set apart for recreational or aesthetic purposes in an otherwise urban environment.

“Hazard” means the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources.⁷

“Heat Island” means the tendency of a built-up urban area to be hotter than its natural or semi-natural surroundings.

“Impact” means the measure of tangible and intangible effects of climate change on natural systems and human society.

“Maladaptation” means adaptation measures which do not succeed in reducing vulnerability and may increase it instead.

“Mean annual rainfall” means the averaged total amount of rainfall recorded during a year.⁸

“Mean annual temperature” means the average temperature of the air for an entire year at any given location.

“Mean sea level” means the height of the sea surface averaged over all stages of the tide over a long period of time.⁹

“Mitigation” means, in the context of climate change, a human intervention to reduce sources of greenhouse gases, or enhance the ability of carbon sinks to sequester carbon.¹⁰

⁵ IPCC, 2014.

⁶ UNFCCC.

⁷ IPCC, 014.

⁸ Australian Government Bureau of Meteorology, 2007

⁹ Encyclopaedia Britannica, 2015

¹⁰ UNFCCC. 2014.

“Nationally Determined Contributions” are the commitments that each country has made on adaptation, mitigation and investment requirements towards the implementation of the Paris Agreement (2015) (also known as Intended Nationally Determined Contributions).

“Resilience” means the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity, and structure (where appropriate), while also maintaining the capacity for adaptation, learning, and transformation.¹¹

“Risk” means the potential for negative consequences to occur through the interaction of vulnerability, exposure, and hazard, where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values.¹²

“Stressor” means a chemical or biological agent, environmental condition, external stimulus or an event that causes stress to an organism.

“Sustainability” means a dynamic process in which individuals, communities, and society are enabled to reach their full potential, maximise quality of life, and meet their economic, social, and cultural needs, while simultaneously protecting, enhancing and managing the natural environment and optimising the economic benefits of ecosystem goods and services which occurs through a framework of good governance and considered decision-making that ensures that these assets, their current functions and future potential are not eroded.

“Vulnerability” means the ability or inability of individuals, social groupings or environmental systems to respond to, cope with, recover from, or adapt to, any external stress (i.e. stress caused by the physical environment such as weather events and earthquakes) placed on their livelihoods and well-being.¹³

2.2. Acronyms and abbreviations

CAPA – Climate Adaptation Plan of Action

CDM – Clean Development Mechanism

COP – Conference of the Parties

DAC – Durban Adaptation Charter

ECAP – Energy and Climate Action Plan

EGS – Economic Growth Strategy

EPWP – Expanded Public Works Programme

GDP – Gross Domestic Product

GHG – Greenhouse Gas

GJ – Gigajoules

HIV – Human Immunodeficiency Virus

ICLEI – Local Governments for Sustainability (International Council for Local Environmental Initiatives)

IDP – Integrated Development Plan

IMEP – Integrated Metropolitan Environmental Policy

INDCs – Intended Nationally Determined Contributions

¹¹ IPCC, 2014b

¹² IPCC, 2014b.

¹³ Kelly & Adger, 2000

IPCC – Intergovernmental Panel on Climate Change
LBSAP – Local Biodiversity Strategy and Action Plan
M&E – Monitoring and Evaluation
NCCRP – National Climate Change Response Policy
NDCs – Nationally Determined Contributions
NGOs – Non-Governmental Organisations
NMT - Non- Motorised transport
PV – Photovoltaics
SAWS - South African Weather Service
SDBIPs – Service Delivery and Budget Implementation Plan
SDS – Social Development Strategy
tCO_{2e} - Tonnes of carbon dioxide equivalent
TB – Tuberculosis
TOD – Transit Oriented Development
UCLG – United Cities and Local Governments
UNFCCC – United Nations Framework Convention on Climate Change
WCWDM – Water Conservation and Water Demand Management programme

3. Context setting

3.1. Problem statement

The latest (2014) Intergovernmental Panel on Climate Change (IPCC) assessment report ⁱ, states that warming of the climate system is undeniable. Since the 1950s, many observed changes have been unprecedented over decades to millennia. The atmosphere and ocean have warmed, amounts of snow and ice have diminished, sea levels have risen and oceans become more acidic as they absorb excess CO₂. Anthropogenic Greenhouse Gas (GHG) emissions are now higher than ever,¹⁴ with atmospheric concentrations of carbon dioxide, methane, and nitrous oxide at their highest for last 800 000 years. The rate and extent of climatic changes are greater than previously projected by climate models.¹⁵ It is therefore important to note that even if extensive GHG emissions reductions are achieved, the lagged effect of GHG emissions will still continue to result in climate change.ⁱⁱ

The climatic changes that Cape Town is facing are:¹⁶

- A decrease in annual average rainfall and changed seasonality of rainfall;
- An increase in mean annual temperature: higher maximum temperatures, more hot days, and more frequent and intense heat waves;
- An increase in average wind and maximum wind strength; and
- An increase in both the intensity and frequency of storms: short, high intensity rainfall events and increased size and duration of coastal storms.¹⁷

¹⁴ Total anthropogenic greenhouse gas emissions have risen more rapidly between 2000 and 2010 than in the previous three decades". Furthermore, "current trends are at the high end of levels that had been projected for this last decade. " (IPCC 2014 a)

¹⁵ IPCC, 2014b

¹⁶ CSAG, 2016

¹⁷ Brundrit. G, 2016

These changes will occur in addition to an increasing mean sea level.¹⁸ It is likely that the severity and impact of storm surges will be exacerbated by this factor.¹⁹

At face value, these impacts and risks seem insurmountable for an individual city to tackle. However, many actions and changes in behaviour can be adopted by the City to begin to mitigate or prepare for increasing climate risk in the future. Together, cities account for around 70% of global energy consumption and energy-related greenhouse gas emissions. Cities are thus the venue of major emissions reductions opportunities. Cities depend on their environment – for food, for water, for resources – yet a healthy environment also depends on cities.

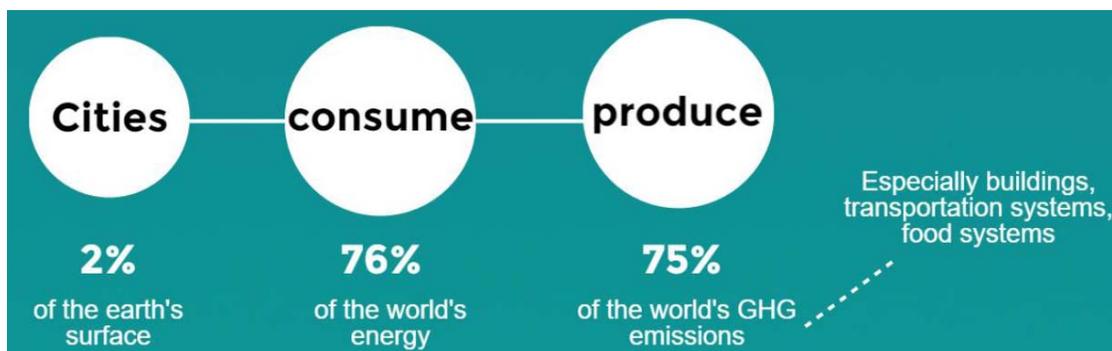


Figure 1: Infographic depicting the role of cities in climate change

The Global Parliament of Mayors, which Cape Town's Executive Mayor Patricia de Lille currently chairs, notes that dense cities with mixed-use development tend to have lower emissions than sprawling cities where city systems such as water and transport must cover a relatively large area. Wise and strategic planning where development is integrated with transportation and water infrastructure can have multiple long-term benefits, including reducing energy costs and fostering a more inclusive city. A comprehensive policy for addressing climate change can thus have local as well as global benefits. Cities must lead the way in combating climate change.

3.2. Need for a climate change policy

Climate change is globally understood to pose the greatest risk yet to socio-economic stability and growth.²⁰ Although the City has been taking steps to reduce its climate vulnerability and carbon emissions, these have been insufficient to address the pace of climate change impacts increasingly affecting Cape Town. This policy recognises that responding to climate change and dealing with its impacts will be difficult and that new and deep changes will be necessary. It provides a framework for the City to transform the way it thinks and operates and to ensure alignment of key City policies with climate change concerns.

Having a clear climate change policy enables the City to understand how to reduce and prepare for these risks (adaptation). The policy also enables all in the City to understand how Cape Town's GHG emissions can be reduced (mitigation) in order to help slow down global climate change, while also benefitting from the consequent outcomes of improved air quality, reduced costs, energy security and improved health.

¹⁸ Tadross & Johnson, 2012

¹⁹ Brundrit. G, 2009

²⁰ World Economic Forum, 2017

Addressing climate change in any city, but especially a city of high inequality like Cape Town, is as much political and economic as it is technical. Agreeing on what is needed is not easy and responding to climate change in an effective manner will, therefore, require partnerships, deliberation, negotiation, learning and leadership.

The policy will require the City to work differently and more collaboratively and is, therefore, designed to provide a framework to encourage and help departments to do this more effectively. The policy further enables the City to move away from the assumption that climate change is an environmental agenda and towards the realisation that it threatens Cape Town's socio-economic future. The City does not exist in isolation from the surrounding region, but rather is dynamically related to the surrounding region with respect to water supply, food supply, tourism, and other economic activities,²¹ and therefore needs to engage with partners beyond its borders, including other municipalities. It is also acknowledged that in order for this policy to be effective the City must work closely in partnership with citizens, business, NGOs, academia, other spheres of government, and other partners across Cape Town. As such, this policy provides clarity on the City's policy position and priorities with regard to climate change.

It is recognised that, while this policy lays out the City's vision for responding to climate change, it will require a long-term and phased approach to ultimately achieve this vision. This policy is a key step in taking the City towards the vision and future revisions of this policy will be informed by evolving climate science, tracking of implementation progress and best practice elsewhere.

3.3. History of climate change strategy and policy in the City

The Integrated Metropolitan Environmental Policy (IMEP) was adopted by Council in 2001 and was later accompanied by a set of implementation strategies. One of these was a draft Energy and Climate Change Strategy, which was developed in 2003 and revised and adopted by Council in 2006. Elements of this strategy were included in the Spatial Development Framework, the City Development Strategy and the Integrated Development Plan (IDP). The Energy and Climate Change Strategy was based on key foundational programmes and projects²² in the City and run through partnerships around the Sustainable Energy, Environment and Development Programme (SEED) (in partnership with Sustainable Energy Africa (SEA)) and the International Council for Local Environmental Initiatives (ICLEI) Cities for Climate Protection Programme (CCP).

The Energy and Climate Action Plan (ECAP), which was adopted by Council in 2010, was based on energy futures modelling and developed to promote the implementation of the IMEP Energy and Climate Change Strategy which was primarily focused on mitigation. To cover the adaptation action gap, in November 2006, the City's Mayoral Committee endorsed a set of principles outlined in the report "Framework for Adaptation to Climate Change in the City of Cape Town", which formed the precursor and basis for all subsequent climate change adaptation related work in Cape Town. This led into the development of nine sectoral Climate Adaptation Plans of Action (CAPAs),²³ seven of which were signed off by the relevant Portfolio Committees in 2011.²⁴ In

²¹ CSAG, 2016

²² These included: Kuyasa solar water heater programme, Build Well Live Well Programme, demonstration houses, Parow municipal facility energy efficiency retrofit, Liquid Petroleum Gas (LPG) City fleet pilot project, first state of energy report, 2003 Cities' Energy Strategies Conference and Cape Town Declaration, 2006 ICLEI World Congress – Carbon Offset Project.

²³ Nine drafted: Biodiversity, Catchment, Rivers & Stormwater Management, Coastal Management, Disaster Risk Management, Health, Human Settlements, Planning, Transport & Roads, and Water & Sanitation.

parallel, the City undertook a comprehensive Disaster Risk Assessment, which identified climate as high on the list of hazards. The assessment led to the development of 23 hazard plans, one of which was a 2012 climate change and coastal process hazards disaster risk management plan. This plan covers sea level rise, storm surge, coastal erosion, sand dune migration, saline intrusion of aquifers, changes in rainfall pattern, changes in aquifer recharge, drought, heat waves, UV radiation exposure, cold spells, tsunamis, harmful marine algal blooms (red tide) and stranding of whales and other animals.

The City was involved at high level in the 17th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 17) hosted in Durban in December 2011, and ran a visible and active campaign during the build up to the event (Climate Smart Cape Town). During this time the Cape Town Climate Change Coalition was launched, providing a communications and collaboration platform for Cape Town-based organisations and institutions involved in or impacted by climate change. Thirty government, academic, civil society and corporate entities signed the coalition charter at the time and the coalition has continued to meet around important climate change issues of relevance to Cape Town.

In 2016, South Africa ratified the Paris Agreement²⁵ which requires all parties to undertake ambitious efforts to combat climate change and adapt to its effects. All sub national governments in the country have a key role to play in contributing to South Africa achieving its Nationally Determined Contributions. Similarly, the climate change response of the City is aimed at supporting the implementation of the Western Cape Climate Change Response Strategy (2014).

Given the international evolution of climate change policy - initially focussing on mitigation and then from the mid-2000s increasingly including adaptation to climate change - it is not unusual for cities internationally to have initially developed mitigation based climate change plans without considering or including climate change adaptation. This Climate Change Policy makes two broad changes from the Energy and Climate Change Strategy (2006) - it recognises that the policy is not merely a sub-component of the City's environmental agenda due to the magnitude of the socio economic risks posed by climate change and the urgency of action required, and it recognises and provides the platform for a balanced approach including both adaptation and mitigation.

In 2017, the Environmental Strategy of the City of Cape Town was developed to replace IMEP, the implementation of which will be supported by a number of proposed and existing tools such as by-laws, policies, planning tools, and strategies. The Climate Change Policy is identified as one of these tools. It is noted that the former positioning of the climate change agenda within IMEP did not facilitate a holistic approach to responding to climate change. The Climate Change Policy therefore provides the overarching framework for climate change work in the City, and as such should be seen as standing alongside rather than as a sub-component of the Environmental Strategy. This policy also replaces the Energy and Climate Change Strategy of 2006, which will be repealed. In addition to supporting the implementation of the new Environmental Strategy, the Climate Change Policy will also support the effective implementation of the City's Economic Growth Strategy and Social Development Strategy, as is detailed in Annexure C. The Climate Change Policy will pave the way for an integrated and comprehensive approach that will culminate with updated and revised plans of action.

²⁴ Seven signed off: Catchment, River and Stormwater Management, Coastal Management, Disaster Risk Management, Health, Human Settlements, Planning, and Water & Sanitation.

²⁵ UNFCCC, 2015

4. Framing the City of Cape Town Climate Change Policy

Based on the projected climatic changes and consequent impacts that Cape Town is already experiencing and will increasingly experience (see further below), and on its relatively high carbon footprint²⁶, the City's response to climate change will focus both on preparing for change at the local level to reduce risks and build adaptive capacity to projected climate change impacts, and contributing to global efforts to reduce GHG emissions.

This approach is designed to realise spin off benefits such as improved resource security (food, water, energy), reduced costs through reduced resource use, improved air quality, improved quality of life, sustainable economic and social development, long-term fiscal efficiency, and the protection of lives, livelihoods, the economy, ecosystems and investments.

The focus of the policy is to design and use the key levers and mechanisms that the City holds to actively drive, influence and enable change. These levers include, amongst others, strategic planning, development approvals, pricing (tariffs and rates) and by-law development and enforcement. In addition, the City will drive change through:

- changing its own operations and service delivery approaches;
- changing the way the City uses internal budgets;
- awareness raising;
- protection, maintenance, rehabilitation, and restoration of natural systems and resources;
- the design and development of integrated human settlements; and
- establishing and strengthening key partnerships.

While this policy is focused on the City's role in responding to climate change, partnerships will be required to enable the City to fully realise its policy intentions. In addition, the City recognises the broader context of climate change response action needed by Cape Town and aims to ensure that its response, in partnership with other stakeholders, directly contributes to and guides the broader South African climate change response.

4.1. Anticipated impacts of projected climatic changes

While the timing and magnitude of impacts remain uncertain, there is little uncertainty regarding the types of impacts that Cape Town is facing and will increasingly face. Increasing global carbon emissions are already starting to tip the balance of local and regional ecosystems in certain parts of the world. Various studies²⁷ have shown that the costs of early action will be far less than the costs of delay and inaction and therefore planning with regards to the anticipated impacts now would be more cost effective in the long term.

The economic impacts of climate changes are predicted to be extensive,²⁸ including impacts on:

- ambient air quality;
- the functionality of the harbour and transport infrastructure;
- decreased availability and increased pricing of resources (e.g. water, energy, food);

²⁶ The official figure including all fuels for Cape Town energy-related emissions for 2012 is 5.55 tCO₂ per capita (City of Cape Town, 2015).

²⁷ DEA, 2011

²⁸ CSAG, 2016

- agricultural productivity and consequently the agro processing industry and export of agricultural products;
- reduced worker productivity;
- increased costs associated with maintenance of infrastructure;
- the insurance sector;
- small and informal businesses;
- Cape Town's natural environment and associated tourism industry; and
- a reduction in disposable income needed for adaptive capacity.

Cape Town's water supplies will be reduced through a decrease in mean annual rainfall, an increase in temperatures and increase in demand caused by population growth (including immigration). The potential for salt water intrusion of groundwater sources would reduce their potential to provide water to Cape Town. Reduced water would, in turn, impact on:

- existing business functioning;
- agricultural productivity and food security;
- quality of water in natural systems; biodiversity;
- and (together with increased wind speeds) the spread, intensity and destructive potential of wildfires and associated adverse air quality.

An increase in the intensity and frequency of storms could lead to:

- further stressed disaster relief systems;
- damage to human health, life, private and public infrastructure and coastlines;
- an inability of existing stormwater systems to cope;
- increased erosion and demands for protection structures;
- lower agricultural productivity; and
- reduced insurance coverage.

The environmental consequences of climate change will directly and indirectly affect the physical, social, and psychological health of humans. Without intervention, climate change is likely to exacerbate the burden of disease, deepen health inequities between and within countries and overwhelm public health infrastructure.²⁹ Increased health risks may include heat stress, higher risk of chronic respiratory diseases and cardio respiratory mortality, and the spread of disease vectors. Increased wind speeds and drier conditions will cause an increase in windblown dust causing air pollution and consequent health impacts.

While plant and animal species may have the ability to adapt or migrate in response to climate change, their survival will be challenged by habitat loss, fragmentation and geographical boundaries to their dispersal. On the aquatic and marine front, impacts on estuaries³⁰ may affect food webs, with consequent impacts on marine ecosystem functioning and the fishing industry. The loss of key ecosystem processes will decrease the ability of estuaries to act as a buffer against the impacts of climate change.

These projected impacts will likely affect all forms of service delivery, with certain communities and businesses likely to be more vulnerable to changes than others. The City in partnership with external stakeholders will use projected climatic changes as a catalyst to reconsider the inefficiencies and inequity in its current systems, methods of service delivery and supply chains, and create new

²⁹ IPCC 2014b

³⁰ Fish stocks are, in many instances, already depleted by over-exploitation and habitat degradation

models that better suit the resource availability and climatic conditions that will prevail. This policy aims to address these identified impacts within the City's mandates and spheres of influence. For a more detailed discussion of the potential impacts of climate change on Cape Town, please see Annexure A.

It is therefore important to note that if the City makes major development and investment decisions now, for example around human settlements locations or electricity distribution infrastructure, without considering climate change adaptation or mitigation, it risks compromising the safety of Cape Town's communities and businesses and locking itself into unsustainable investments.

4.2. GHG emissions context for Cape Town³¹

The table below outlines energy consumption and GHG emissions figures for Cape Town from 2001 to 2012.³²

Energy, carbon emissions, and related intensities over time, Cape Town, 2001 - 2012				
	2001 excl. ³³	2007 excl.	2012. excl	2012 incl.
Energy (GJ)	109 311 370	127 595 550	141 095 151	158 685 055
Emissions (tCO ₂ e)	16 502 801	20 550 172	20 010 470	21 282 238
Population	2 892 243	3 374 572	3 837 414	3 837 414
Emissions intensity (tCO₂e/capita)	5.71	6.09	5.21	5.55

Cape Town's high carbon footprint is a result of energy supply being fossil-fuel based: the commercial and residential sectors use Eskom coal-power generated electricity (which is very high in carbon emissions) almost exclusively to meet their energy needs; and transport fuels (diesel and petrol), while lower in carbon than electricity, account for a large and growing proportion of energy use. Transport fuel consumption growth can be attributed to the City's sprawling urban form, high average commuter trip length, very high and growing single occupancy vehicle usage, and an inadequate public transport system which is predominantly reliant on fossil fuels. Currently 53% of commuter trips are by private vehicle, 18% by train, and 20% by minibus taxi or bus. While all these modes are carbon-intensive, per capita emissions are substantially less for trains, followed by minibus taxis and buses. On the positive side, between 2007 and 2012, Cape Town's average annual electricity consumption growth rate was lower than its annual average population and economic growth rates – a possible decoupling due to a combination of factors: the shock of load-shedding starting in 2006, the subsequent increase in electricity costs, increase in efficiencies, and extensive behaviour change campaigns.

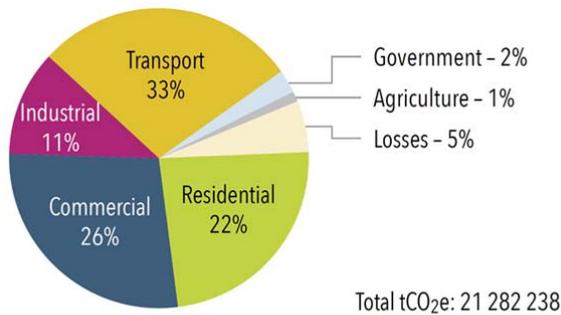
³¹ This applies to the City of Cape Town's jurisdictional boundaries. It does not include Scope 3 emissions. The City conforms to international GHG emissions reporting standards (its inventory is Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) compliant). Scope 3 consumption emissions may be included in future.

³² City of Cape Town, 2015

³³ 'excl' means excluding marine and aviation fuels, while 'incl' means all fuels included.

Carbon emissions by sector, Cape Town, 2012*

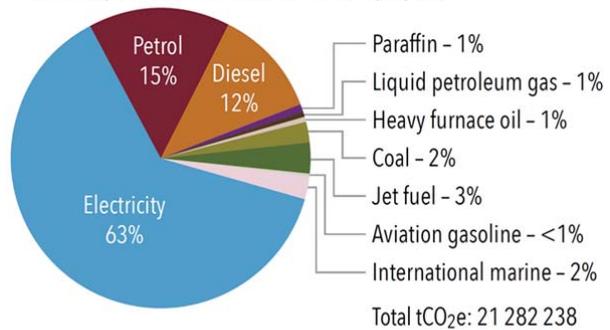
* Including aviation, international marine, electricity losses



Source: City of Cape Town, Eskom, Province, SAPIA.

Carbon emissions by energy source, Cape Town, 2012*

* Including aviation, international marine, electricity losses (electricity losses included in the electricity figure)



Source: City of Cape Town, Eskom, Province, SAPIA.

Figure 2: Carbon emissions by sector and by energy source

Transport dominated 2012 energy consumption (64%), followed by the commercial (13%), residential (12%) and industrial (8%) sectors, with the City’s municipal consumption accounting for 1%.³⁴ In terms of carbon emissions, however, transport accounted for 33% of emissions, while residential, commercial and industrial together accounted for 59% (see figure 1). Cape Town mirrors the national mix of electricity production, the majority of which generated by Eskom. South Africa’s electricity is mostly coal-based with a small amount of nuclear power and renewable energy. Despite the City being 96% electrified, wood fires are still used, which has implications for particulate pollution.³⁵

In terms of local benchmarking of tCO₂e per capita emissions (see Figure 2 below), Cape Town aligns closely with the other major metropolitan municipalities of Johannesburg, Tshwane and Ekurhuleni. EThekweni has a higher per-capita footprint, partly due to its large industrial sector.³⁶ While Cape Town is more electricity efficient than the other cities, transport is now driving Cape Town’s energy consumption growth.

³⁴ City of Cape Town, 2015

³⁵ Particulate matter, also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulphates), organic chemicals, metals, and soil or dust particles. (United States Environment Protection Agency)

³⁶ City of Cape Town, 2015

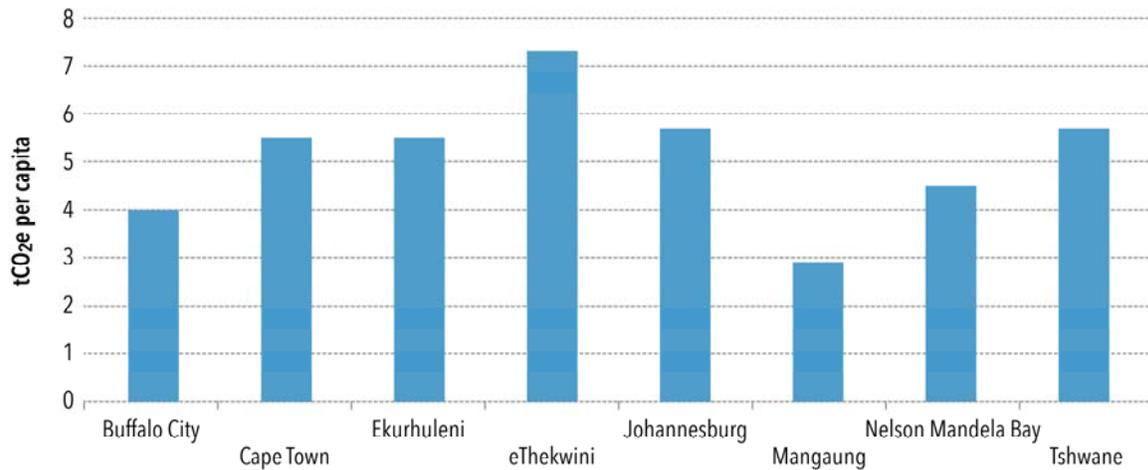


Figure 3: Energy-related GHG per capita for South African metros, 2012³⁷

As per the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA), the City adopted an Air Quality Management Plan (AQMP) and designated an Air Quality Officer (AQO). Furthermore, the NEM: AQA stipulates that industries with Section 21 Listed Activities need to apply for Atmospheric Emission Licenses. This ensures that the City has current and complete information on all significant sources of identified atmospheric emissions, including GHG emissions. Emission inventories provide a specific basis through which industries could be monitored and regulated to reduce atmospheric emissions.

4.3. Current implementation of response action to increase climate change resilience and decrease emissions

The City is already working extensively to prepare for change at the local level to reduce risks and build adaptive capacity, to contribute to global efforts to reduce GHG emissions and to build a more resource efficient and resilient Cape Town. In recognising that not all risks can be managed, the City looks to understand what risks it needs to live with and where it can and should build resilience against risks to minimise their impacts or recover from disasters when they happen in order to minimise long term impacts.

Levels of exposure to climate change related risk and the levels of GHG emissions that people are responsible for vary greatly across different income bands and sectors. In tackling climate change at the city scale it is, therefore, not only the overall levels of climate change risk and GHG emissions that matter, but also the distribution of these risks and emissions.

The array of climate-related challenges faced by the City are interconnected and often exacerbated by inefficient use of resources and technology and the way in which we have designed our city. The solutions to addressing climate change therefore need to be cross-cutting, holistic and must consider those most affected. It is recognised that delays or non-action on global mitigation of GHG emissions will have disastrous consequences for the earth's climate, with subsequent impacts. The longer GHG mitigation takes, the greater the required adaptation efforts will be and there is a limited range of conditions under which effective adaptation can happen.

³⁷ City of Cape Town, 2015

Anticipating, reducing, responding to and coping with identified impacts necessitates an integrated approach across the City. This relies on strong leadership to maximise collaboration across line functions and to strategically harness resources where they are available. Central to this approach is the disaster risk management function which is mandated through national legislation to anticipate and reduce disaster risk, including climate change adaptation, as well as respond to disasters when these cannot be avoided. The inclusion of climate change adaptation into the Disaster Risk Management Act (Act 57 of 2002), through amendments to the Act passed in 2016, make explicit the role of Disaster Risk Management in efforts to reduce the risks associated with climate change. The structures associated with disaster management, such as the City's Disaster Risk Management Advisory Forum, provide a cross-sectoral platform which work towards integrating climate change responses across the City.

Internationally, the City has already taken steps towards joining and forming low carbon, energy efficient and climate resilient partnerships (further detailed in section 6.1). The City also works closely with key national departments and programmes, the Western Cape climate change programme, and certain academic, business and civil society organisations, although it is acknowledged that more work is needed in this regard. Locally, the City aims to address climate change through strategic policy frameworks such as the City's Integrated Development Plan, Spatial Development Framework and the City Development Strategy, as well as through action planning to co-ordinate implementation.

For a more detailed discussion of work done to date by the City of Cape Town, please see Annexure B.

4.4. Policy parameters

This policy intersects with a number of other City policies and strategies and aims to highlight the climate change related aspects of these documents.

Effecting change within the City takes time and effort as it requires, amongst other things:

- changes in how functions operate;
- the use of different or new technologies and approaches;
- different financing and budgeting mechanisms and sources; and
- networks with internal and external stakeholders.

Climate change is a challenging area of work and cannot be addressed by local government alone. This policy is therefore a commitment by the City to do achieve as much as possible within identified constraints and challenges.

It is intended that, over time, climate change related considerations will eventually be mainstreamed into all City policies, strategies and decision making, and therefore the need for a standalone climate change policy will be reviewed in the future.

5. Vision and desired outcomes

5.1. Vision

To become a city that is climate resilient, resource efficient and lower carbon³⁸, in order to enable sustainable and inclusive economic and social development, and environmental sustainability.

5.2. Long-term desired outcomes

In order to realise the above vision, the City aims to achieve the following long-term outcomes. The City recognises that these long-term outcomes are ambitious and aspirational and should be seen as end-states to strive for and work towards, rather than binding goals or targets. While the policy is aimed at being aspirational and providing clear directives, it is also aimed at helping the organisation along a path of transformation.

In the long-term, the City will work to ensure the following:

- 5.2.1. All City-led projects or programmes have incorporated climate change considerations into their design and implementation.
- 5.2.2. The City accesses and uses both the best available technologies and most up to date climate science data, assessment and monitoring tools³⁹, information and knowledge as well as local and context-relevant knowledge to better manage resources, monitor progress and inform decision making.
- 5.2.3. Cape Town has lowered its carbon footprint, as per the carbon targets set in the City's Energy2040 vision⁴⁰.
- 5.2.4. The City implements and enables a compact urban form, with development that is resource efficient, well located and well connected, in order to grow within the limits of available resources and enable social and economic inclusivity.
- 5.2.5. The City incorporates climate change adaptation in the construction and maintenance of service delivery infrastructure so as to minimise future impacts.
- 5.2.6. Disaster risk management takes a proactive approach and is integral to climate change response efforts.
- 5.2.7. Social and economic development are optimised and made more inclusive through the effective management of climate change risks and resources including recovery from climate related disasters.
- 5.2.8. Cape Town's natural ecosystems are protected, managed and made resilient so that they can act as effective buffers to climate change impacts and provide benefits of ecological infrastructure in support of current and future physical infrastructure.
- 5.2.9. Cape Town's businesses and citizens, particularly the most vulnerable communities, are made more aware of and are able to withstand the impacts of climate change.
- 5.2.10. Climate change is seen as a shared risk to Cape Town and all citizens work collectively to address climate change.

³⁸ As agreed by Council in October 2015: Carbon reduction target of 13% by 2020 and 37% by 2040 off business as usual

³⁹ e.g. to measure carbon footprints or various aspects of resilience at a project, programme or City level

⁴⁰ As agreed by Council in October 2015: Carbon reduction target of 13% by 2020 and 37% by 2040 off business as usual

6. Principles and directives

The principles of this Policy are as follows:

- 6.1. Factor in long-term and cross-sectoral impacts and benefits in planning and decision-making
- 6.2. Improve resilience and reduce vulnerability
- 6.3. Promote a lower carbon approach
- 6.4. Support well-functioning ecosystems that enable service delivery and reduce risk
- 6.5. Promote socio-economic benefits and their equitable distribution
- 6.6. Ensure climate compatible urban design and infrastructure development and maintenance
- 6.7. Promote and support behaviour change in all citizens

These principles aim to collectively enable the City to achieve its climate change response vision and outcomes. An overarching principle that cuts across these seven principles is that of taking a balanced, and, where possible, synergistic approach to climate adaptation and mitigation i.e. ensuring co-benefits of mitigation work that enhance adaptive capacity and adapting in a way that contributes to mitigation.

Each principle is given effect through a set of directives that are intended to inform and guide ways of working across the organisation. In practice, these directives will inform the revision of:

- policies and strategies across the City
- the development of new action plans, including (but not limited to) a revised Climate Change Adaptation Action Plan and a new Climate Change Mitigation Action Plan

The City will implement the Climate Change Policy in a transversal manner, and will work with relevant stakeholders outside of the City to collectively achieve its climate change response vision. These external stakeholders will include, amongst others, all spheres of government, the business community, academic and research institutions, community organisations, NGOs, and CBOs.

6.1. Factor in long-term and cross-sectoral impacts and benefits in planning and decision-making

Problem statement

Present action or inaction in responding to climate change will affect future generations and multiple sectors. It is more efficient, cost-effective and equitable in the long-term to act sooner rather than later and to act proactively rather than reactively. Due to the nature and complexity of climatic systems there is a lagged effect between mitigation action and the ability of climatic systems to respond to the reduction in GHG emissions. While the impacts of climate change are already being realised in the form of increased rainfall intensity, flooding, droughts, temperatures, sea level rise and storm surges, making adaptation necessary, if climate change adaptation and mitigation measures are not enacted now the impacts in the future will be even greater.ⁱⁱⁱ

Cape Town already experiences challenges in coping with resource demands, which will be further stressed and impacted on by population increase and climate change; the highly dynamic and unpredictable nature of climate change means that there will be many cross-sectoral impacts. Certain resources, such as water, are essential to the functioning of many sectors and therefore decision-making must take into account the impact that a loss of any of these resources would cause.

Principle

The City will work to ensure that short, medium, and long-term actions and decisions support its aims of reducing GHG emissions and improving resilience both directly and indirectly.

Accordingly, being committed to a lower carbon future, the City supports the call for responsible disinvestment in assets, companies and activities responsible for unmitigated high levels of carbon dioxide into our atmosphere. In accord with the prudential provisions of the Municipal Finance Management Act, 2003 (Act 56 of 2003) and the requirement for the City to responsibly manage its investments, the City will make efforts to clarify where it has direct or indirect investments in the fossil fuel industry, and where possible take steps to divest, or reinvest in climate-friendly activities.

Directives

In this regard, the City will

- 6.1.1. Incorporate life cycle costs and benefits and consider the long-term and cross-sectoral potential impacts of and on climate change in design, decision-making, operating and implementation across all City departments when approving developments or making budgetary or investment decisions, to avoid maladaptation and unnecessary investment and costs.
- 6.1.2. Apply multi-criteria analyses that specifically include climate change considerations in making major investment decisions.
- 6.1.3. Identify key resources (such as water) that are essential for cross-sectoral functioning and ensure that these resources are appropriately managed and conserved.
- 6.1.4. Monitor, forecast and manage Cape Town's resource availability and future resource needs to ensure that the City is able to continue to provide basic services and minimise the occurrence of resource shortages or crises.
- 6.1.5. Seek synergies between stormwater, water, wastewater, and other environmental systems by promoting water sensitive urban design principles to ensure that development sustainably integrates all components of the urban water cycle.
- 6.1.6. Work in close collaboration with relevant Provincial and National Authorities, NGOs, neighbouring municipalities and the private sector to collaboratively plan and manage water supply and demand, manage air quality and strengthen food security, including supporting the establishment and strengthening of catchment management agencies.
- 6.1.7. Transform the transport sector and land use patterns through the implementation of the Comprehensive Integrated Transport Plan (CITP) and the Transport Development Authority (TDA) By-law.
- 6.1.8. Retain flexibility in decision making in the face of climate projection uncertainties through the use of buffers, comprehensive vulnerability, risk and adaptation planning, regular reviews of scenario planning, and the exploration of small-scale decentralised modes of services delivery, so as to minimise lock-in to investments that may have long-term negative or unintended consequences.
- 6.1.9. Integrate climate change considerations into City policies, strategies and operating procedures.
- 6.1.10. Amend policies and management practices to allow for the realisation of long-term benefits, even where these may incur short-term losses or come at the cost of short-term gains.
- 6.1.11. Amend policies and management practices to support the testing of new technologies and the use of innovative and not widely used technologies and approaches, where successful pilots have proven their value.

- 6.1.12. Develop and rollout financing mechanisms or funding models that support and incentivise a lower carbon, resource efficient and climate resilient approach. Further to this, the City will, to the extent possible and progressively over time:
- (a) seek to understand and be transparent about the extent of its own investments in fossil-fuel related industries;
 - (b) work to understand the implications of investing in or divesting from these investments;
 - (c) consider making amendments to the City's Investment Policy to take steps towards divestment, where appropriate and in line with our risk and return appetite; and
 - (d) communicate its divestment decisions to all investment partners and broader stakeholders.

6.2. Improve resilience and reduce vulnerability

Problem statement

Significant socio-economic challenges exist in Cape Town, including marked inequality and a large proportion of the population living in poverty.⁴¹ Gender, age, health, race, poverty and many other factors can all contribute to increased vulnerability of individuals and communities. Poorer communities are often the most vulnerable to climate change impacts due to their marginal locations and relative inability to invest in mitigation and adaptation measures, and certain economic sectors (such as the agricultural sector) are more susceptible to climatic variations. Smaller or less formal businesses, while potentially more flexible and responsive to change, frequently have less of a buffer to handle change than larger or more established ones. While the City aims to prevent or minimise the impacts of natural and human induced 'shock' events, the projected increase in the intensity and frequency of these will make this a challenging task in a resource constrained environment. Likewise, the City's Health Services will be placed under further pressures from climate change related in-migration and urbanisation, as well as a potentially increased burden of disease. Strengthening resilience will work towards alleviating increased stress on social welfare services.

Principle

The City will work to ensure that its actions and decisions increasingly and progressively maintain and strengthen resilience and reduce the vulnerability of Cape Town's environment, communities, and economy to climate change impacts, including the ability to recover from repeated shocks.

Directives

In this regard, the City will:

- 6.2.1. Consider the impacts of climate change in terms of exacerbating vulnerability, when undertaking strategic assessments, approving development, or making budgetary decisions in order to prevent, minimise or remedy impacts.
- 6.2.2. Assess how to manage risk on a case by case basis where development rights already exist and develop appropriate tools to address this risk.
- 6.2.3. Encourage and enable innovation and agency within communities to both assess and address their own resilience needs, with a view to incorporating these into the IDP process and other corporate strategic processes to support implementation within communities.
- 6.2.4. Work with national government and other relevant partners to research, cost, develop, and implement early warning systems for climate related hazards.

⁴¹ City of Cape Town, 2014

- 6.2.5. Develop long term financial planning horizons for disaster risk management that can incorporate cost effective risk reduction, rather than short term high cost reactive responses.
- 6.2.6. Enable a proactive approach to disaster risk reduction in order to implement the requirements of the Disaster Management Act, 2002 (Act 57 of 2002).
- 6.2.7. Assess and prioritise the immediate costs and long-term financial and environmental benefits of the protection or relocation of City infrastructure identified as being at risk from climate change.
- 6.2.8. Assess and prioritise the immediate costs and long-term financial and environmental benefits of the protection and maintenance of areas which provide key ecosystem services and ecological infrastructure.
- 6.2.9. Avoid, limit or restrict development in areas deemed unsuitable due to high risk of climate change impacts, work to protect City infrastructure already located in these areas, and ensure that where development does take place that materials are used that are resilient to impacts such as higher temperatures, flooding and wind.
- 6.2.10. Ascertain the most appropriate ways to improve the resilience of economic sectors and businesses vulnerable to climate change impacts or response measures and work to reduce the impacts on these sectors and their employees.
- 6.2.11. Actively work towards achieving improved resource efficiency by promoting innovation in service delivery, building resource efficiency requirements into development approvals, and integrating spatial planning and transport planning in the City.
- 6.2.12. Maximise co-incidental benefits and opportunities available to the City through the implementation of proactive resilience measures.
- 6.2.13. Identify climate change related impacts on the food system (food production, processing, availability, distribution, accessibility, utilization, consumption and stability), promote urban agriculture and work to support all aspects of the food system so as to address issues of food security.
- 6.2.14. Conserve water to reduce the disturbance to the environment in the form of additional large water storage infrastructure (dams) and minimise the impacts of water shortages on natural systems, health and the economy.
- 6.2.15. Investigate and implement innovative technologies to sustainably manage water and wastewater.
- 6.2.16. Monitor Cape Town's air and water quality (drinking water, sewage effluent, inland and coastal waters, estuaries, and groundwater) and take appropriate legal action where required.
- 6.2.17. Recognising that informal housing is likely to remain part of the urban fabric, actively promote and enable the development of climate resilient informal housing and work to facilitate residents to take a more active role in their long-term housing and its climate change resilience.
- 6.2.18. Address environmental health and human health challenges arising from climate change induced impacts.

6.3. Promote a lower carbon approach

Problem statement

South African cities have relatively high carbon footprints for developing country cities, as a result of dependency on fossil fuel based energy sources, particularly coal based electricity. To achieve lower carbon city development and growth, significant efficiencies still need to be realised across all sectors in Cape Town, and access to cleaner, more diversified and localised energy sources will be required. The production of waste must be minimised and, where appropriate, energy must be generated from waste and sewage. With the transport sector clearly driving energy consumption

growth in the future, it is critical to reduce the number of private transport trips through transit-oriented development, travel demand management, higher vehicle occupancy and improved public transport, with the added benefit of making it much more accessible, affordable, safe and user friendly to all. The spatial form of the city (low density, and separation of uses and communities) perpetuates long travel distances, which results in a high carbon footprint. In addition, carbon emissions from transport need to be reduced through innovative technologies, in support of the green economy (see 6.5 below).

Poor air quality is associated with a high carbon footprint and improved air quality can be a significant co-benefit of a reduced carbon footprint. As Cape Town is part of a national electricity grid, the city is partially responsible for the air quality, environmental and human health impacts resulting from electricity production near coal powered plants in other parts of South Africa and experiences the same impacts locally due to the burning of liquid fuels, biomass, solid fuels (such as coal by industry), and dirty fuels (such as heavy fuel oil), all of which affect the poorest communities the most.

Principle

In taking decisions, operating, designing and planning for the future, and in providing enabling support, the City will, together with partners, steer Cape Town towards a lower carbon urban development path, and in so doing contribute to limiting dangerous levels of global (and thereby local) average temperature warming in accordance with the Paris agreement^{iv}.

Directive

In this regard, the City will:

- 6.3.1. Promote economic growth that is decoupled from increased energy consumption.
- 6.3.2. Promote energy conservation and efficient practices, technologies and infrastructure in all residential, economic and public sectors, particularly higher users, and implement these in the City's own facilities and operations where feasible.
- 6.3.3. Explore, promote and enable cleaner, cost-effective, diversified and localised low-carbon energy production in all sectors of the economy and across all income groups and implement these in the City's own facilities and operations where feasible.
- 6.3.4. Enable development in locations that promote a compact city rather than urban sprawl and encourage energy-efficient design and construction of all new buildings, renovations, and operation of existing buildings, across both the public and private sectors.
- 6.3.5. Improve the accessibility, affordability, reliability, and safety of public transport through the roll-out of the Integrated Public Transport Network (IPTN), and through greater integration between MyCiti, the rail service, the bus service and the mini-bus taxi industry.
- 6.3.6. Promote Transit Oriented Development (TOD), enabling greater urban densities that will increasingly allow for low carbon travel alternatives, including:
 - 6.3.6.1. a modal shift in favour of more sustainable transport modes in transport choices across Cape Town;
 - 6.3.6.2. the use of non-motorised transport and other low carbon transport options;
 - 6.3.6.3. the use of alternative fuels and vehicle technologies;
 - 6.3.6.4. increased occupancy levels in private vehicles;
 - 6.3.6.5. densification, particularly along public transport routes, in order to reduce transport distances and the overall need to travel; and
 - 6.3.6.6. alternatives to travel through technology.
- 6.3.7. Promote regional food sourcing and reduced consumption of highly carbon intensive agricultural products.

- 6.3.8. In line with the waste hierarchy, promote waste minimisation, and the reduction of methane emissions from landfill sites and wastewater treatment works, and implement waste to energy measures where appropriate.
- 6.3.9. Re-use treated effluent for industrial processes and irrigation to reduce the need for large, high energy consuming potable water treatment facilities.
- 6.3.10. Ensure that alternative sources of water being investigated, such as stormwater harvesting and re-use, have a lower carbon footprint.
- 6.3.11. Ensure the wise and sustainable management, protection, and restoration of natural carbon sinks in Cape Town (e.g. wetlands and soil).

6.4. Support well-functioning ecosystems that enable service delivery and reduce risk

Problem statement

Many of Cape Town's open spaces and ecosystems are in a poor condition,⁴² are not used optimally and are increasingly exposed to development pressures within an urban context, for example for housing and roads. The City has historically focused on hard engineering as opposed to softer or "green" engineering solutions to addressing climate change impacts. Livelihoods, community enjoyment of open spaces, biodiversity, water security and the quality of air, water and soil, are dependent on ecosystem goods and services, which are threatened by projected climatic changes. Ecological infrastructure can be used as a significant resource for building resilience while conserving ecosystem integrity, for example, the use of natural river and wetland systems to reduce flood risk can provide a sustainable drainage system while holding water for future supplies.

Principle

The City will work to ensure that its actions and decisions retain, restore, and where possible expand and optimise ecosystem functioning and ecological infrastructure and that such work is integrated with the City's development needs as a means of adapting to climate change impacts and sequestering carbon.

Directives

In this regard, the City will:

- 6.4.1. Identify and implement immediate, medium and long-term interventions required to protect, manage, and restore existing and degraded natural ecosystems.
- 6.4.2. Consider a green engineering design approach to complement and support physical infrastructure in all infrastructure master plan reviews, new capital development, and operations where feasible or cost effective in the long term.
- 6.4.3. Monitor and manage the quality of ecosystems to improve safety and to minimise or avoid risks to communities (e.g. human health, flooding) due to climate change.
- 6.4.4. Promote urban greening to improve environmental quality and ecosystem health and reduce negative climatic impacts of urban heat islands.
- 6.4.5. Supplement the goods and services natural systems typically provide with appropriate new ecological infrastructure (e.g. artificial wetlands), to improve ecosystem resilience and hence the ability of natural, rehabilitated, and artificial systems to buffer Cape Town from the impacts of climate change.

⁴² City of Cape Town. 2014

- 6.4.6. Consider the social, economic, and environmental value of ecosystems and ecological infrastructure in taking strategic, budgetary and planning decisions which may affect the integrity of these ecosystems and infrastructure.

6.5. Promote socio-economic benefits and their equitable distribution

Problem statement

Significant socio-economic challenges exist in Cape Town, including income disparity, skills shortages, and a lack of services in informal settlements and previously disadvantaged areas. The current national energy crisis impacts on economic activities and growth, against the backdrop of significant unemployment and a national drive for job creation. Approximately 33 000 people move to Cape Town each year in search of better opportunities⁴³. This in-migration is likely to increase in the future, partially due to climate change impacts on the sustainability of rural livelihoods.

This in-migration results in increased pressure for delivery of basic services and a potentially increased burden of disease on the poorest of the poor. Joblessness forces people to adopt survivalist approaches, which can have negative social, environmental, and health impacts on communities.

Principle

The City will work to ensure that its actions and planning directly contribute towards an improved understanding of the socio-economic challenges and impacts of climate change, take steps to address these, and seek to maximise the socio-economic opportunities that may arise from adapting to and mitigating climate change in an inclusive manner, enabling the City to use climate change as an opportunity to rethink and transform how it deals with issues such as poverty, inequality, and the informal sector.

Directives

In this regard, the City will:

- 6.5.1. Research, understand and routinely monitor the socio-economic impacts of climate change and consider these in design, planning, decision making and implementation in order to strengthen the adaptive capacity of Cape Town's economy and all citizens.
- 6.5.2. Implement Transit Oriented Development (TOD), enabling the creation of greater density and mixed use development along public transport routes; shifting urban form towards a more compact, connected and socially inclusive city.
- 6.5.3. Identify skills development needs and encourage investment in skills development initiatives that support climate change adaptation and mitigation initiatives.
- 6.5.4. Work with economic sectors that provide significant jobs and income generation, which are at highest risk from climate change, to understand and prepare for the impacts of climate change and to transition to operate efficiently in a changed environment.
- 6.5.5. Work with informal businesses and street traders to build adaptive capacity to the impacts of climate change.
- 6.5.6. Stimulate the creation of new and sustainable jobs in the green economy and better social outcomes through the design and implementation of mitigation and adaptation interventions, including natural resource management.

⁴³ City of Cape Town. 2014.

- 6.5.7. Facilitate access to new economic opportunities related to addressing climate change mitigation or adaptation through partnerships and various forms of support.
- 6.5.8. Encourage and invest in new and existing innovative and locally relevant low carbon and climate resilient technologies and approaches, many of which can save money in the long term.
- 6.5.9. Consider the life-cycle cost of goods and services in City supply chain management processes, thereby promoting the use of climate appropriate resources, technologies and approaches and stimulating the market for these products and services, with a focus on local supply where available.

6.6. Ensure climate compatible urban design and infrastructure development and maintenance

Problem statement

Many formal and informal structures within Cape Town have been constructed in a climate- or resource-inefficient way. Climate change related factors have not always historically been considered in the awarding of development rights. The legacy of apartheid and income differences have resulted in the spatial segregation of Cape Town and in a disparity of access to amenities and services, which the City is working to rectify. Cape Town experiences a very high level of traffic congestion, which is partly due to the over-reliance on single occupancy vehicles. Urban densification is not yet taking place at a sufficient rate or intensity along transit oriented corridors and will need to be intensified through initiatives by the City in partnership with other spheres of government, parastatals and the private sector.

This “inward growth strategy” makes the provision of public recreational and green spaces increasingly important. Many of the City’s existing parks and urban recreational green spaces, which can act as buffers to increased temperatures, deliver ecosystem services, and support unique biodiversity, are underutilised, not well-maintained, or unsuited to the needs of neighbouring communities. Additionally, infrastructure in Cape Town, such as that along the coast, is already at risk of being impacted by climate change.

Principle

At a city-wide level, the City will use its planning, operating, investment and regulatory powers to directly and indirectly improve the design of infrastructure and urban space, spatial transformation and integration of the city, in order to increase urban efficiency (and hence contribute towards climate change adaptation and mitigation), while at the same time contributing to the socio-economic needs of the poor. The creation of the Transport and Urban Development Authority (TDA), specifically to implement TOD, is one of the major steps in implementing this principle.

Directives

In this regard, the City will:

- 6.6.1. Implement resource efficiency and climate impact considerations in the design, development, and renovation of City infrastructure where possible and include requirements for resource efficiency and climate impact considerations in spatial planning, land-use, and building development approvals.
- 6.6.2. Review City planning and building development policies and by-laws to ensure the effective incorporation of climate considerations where appropriate and ensure effective enforcement thereof.

- 6.6.3. Implement incentives for development that promotes climate change mitigation and adaptation principles
- 6.6.4. Ensure the implementation of water sensitive urban design principles in all development to strengthen Cape Town's water supply and stormwater resilience.
- 6.6.5. Consider the impacts of climate change on human health when designing, maintaining, improving, and developing recreational spaces, public transport facilities and health care facilities (e.g. drinking water points, reducing heat island effect, shade etc.).
- 6.6.6. Transform the transport sector through the roll out the CITP Strategy of One, the IPTN, applying the TOD Strategic Framework and its related toolkit, reviewing the SDF and related plans, review of the Integrated Human Settlements Framework, as well as other mitigation initiatives through the City's Travel Demand Management Strategy and non-motorised transport suite of strategies.

6.7. Promote and support behaviour change in all citizens

Problem statement

Due to pressing socio-economic challenges, lack of awareness, and perceptions that climate change cannot be stopped, climate change is generally not considered to be a personal priority by the majority of Cape Town's citizens. Awareness of the causes of climate change and impacts of climate change on human health, property, the economy and livelihoods, amongst others, is poor. Scientific information related to climate change is more often than not communicated in a way that is confusing, misleading, or leads to disbelief or despair about the existence and impact of climate change. Similarly, awareness of steps that can be taken for individuals and organisations to reduce their resource use, to protect households against climate change and to take advantage of opportunities that arise from responding to climate change requires improvement.

Principle

Recognising that a sense of citizen responsibility can only be instilled when citizens are empowered and informed, climate change communication and awareness will be regular and simple, enabling citizens to make informed decisions regarding their actions and behaviours, reduce resource use, prepare for potential risks and impacts, and understand the climate change challenges and opportunities that the City is dealing with.

Directives

In this regard, the City will:

- 6.7.1. Better understand the communication needs of all and communicate climate change information to the public in a simplified manner in all three official languages of the City.
- 6.7.2. Open communication channels so as to actively listen to and learn from stakeholders and partner with these stakeholders to co-design solutions to climate change related challenges.
- 6.7.3. Lead by example by transparently considering and making note of climate change in all decision making and service delivery implementation.
- 6.7.4. Make reference to climate change in all relevant communications (e.g. media releases and publications) to the public.
- 6.7.5. Ensure that climate change information and resources are made available through all relevant channels of communication to external stakeholders including teachers, learners, communities, and businesses, using existing communication programmes where possible.

- 6.7.6. Encourage and enable citizens to reduce their resource use where possible (including energy use, water use, waste production, food choices etc.).
- 6.7.7. Encourage and enable citizens to protect themselves and adapt against potential impacts.

7. Strategic alignment

The outcomes, principles and directives articulated in the Climate Change Policy support the strategic vision of the City of Cape Town as articulated in the IDP. Strategic alignment to the IDP as well as to key high level City strategies (including the Economic Growth Strategy, the Social Development Strategy, and the Environmental Strategy) is outlined in Annexure C.

In addition, the Policy supports the aims of the National Development Plan (NDP), which highlights that South Africa's primary approach to adapting to climate change lies in strengthening the nation's economic and societal resilience to future impacts of climate-change. This can be done by decreasing poverty and inequality; creating employment; increasing levels of education and promoting skills development; improving healthcare; and maintaining the integrity of ecosystems and the many services that they provide. Similarly, with respect to climate change mitigation the NDP acknowledges that the country can gain a competitive advantage through becoming an early adopter of mitigation technologies and mitigation finance mechanisms that fit the local context, as opposed to competing for carbon space tied to obsolete fossil-fuel technologies.

Finally, this policy also aligns with the following key United Nations Sustainable Development Goals:

- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;
- Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation;
- Goal 10. Reduce inequality within and among countries; and
- Goal 13. Take urgent action to combat climate change and its impacts. ⁴⁴

8. Regulatory context

8.1. National legislation and policy

Various pieces of national legislation provide a guiding framework for this policy, with the most notable being the following:

- The Constitution of the Republic of South Africa, 1996
- Customs and Excise Act, 1964 (Act 91 of 1964): Carbon Dioxide Emission Levy
- Disaster Management Act, 2002 (Act 57 of 2002, as amended 2015)
- Electricity Regulation Act, 2006 (Act 4 of 2006, as amended 2007)
- Municipal Systems Act, 2000 (Act 32 of 2000)
- National Building Regulations and Building Standards Act, 1977 (Act 103 of 1977)
- National Climate Change Response Policy (2011)
- National Energy Act, 2008 (Act 34 of 2008)
- National Environmental Management Act, 1998 (Act 107 of 1998)
- National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)

⁴⁴ <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
- National Environmental Management: Integrated Coastal Management Act, 2008 (Act 24 of 2008)
- National Environmental Management: Protected Areas Act, 2003 (Act 57 of 2003)
- National Environmental Management: Waste Management Act, 2008 (Act 59 of 2008)
- National Water Act, 1998 (Act 36 of 1998)
- Water Services Act, 1997 (Act 108 of 1997)
- Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013)
- Taxation Laws Amendment Act, 2015 (Act 25 of 2015)
- White Paper on Energy Policy, 1998
- White Paper on the Renewable Energy Policy of South Africa 2004

The manner in which each of the above supports and gives effect to the Climate Change Policy is detailed in Annexure D. Legislation that is in draft form has not been included in the above list. Once draft legislation has been promulgated, it will be added to revisions of this policy.

8.2. City of Cape Town by-laws and policies

- Air Quality Management Plan for the City of Cape Town (2005)
- Cape Town Densification Policy (2012)
- Cape Town Spatial Development Framework (2012)
- City of Cape Town Air Quality Management By-law (2016)
- City of Cape Town Bioregional Plan (2015)
- City of Cape Town By-law relating to Stormwater Management (2005)
- City of Cape Town Coastal Management Programme (2015)
- City of Cape Town Integrated Coastal Management Policy (2014)
- City of Cape Town Integrated Waste Management By-law (2009) as amended
- City of Cape Town Municipal Planning By-law (2015)
- City of Cape Town Urban Design Policy (2013)
- City of Cape Town Water By-law (2010)
- City Parks Development Policy (2009)
- Comprehensive Integrated Transport Plan 2013-2018 (2014)
- Constitution of the Transport and Urban Development Authority of Cape Town Amendment By-law (2017) (TDA By-law)
- Floodplain and River Corridor Management Policy (2009)
- Integrated Waste Management Plan (2013)
- Integrated Waste Management Policy (2006)
- Local Biodiversity Strategy and Action Plan (LBSAP) 2009-2019 (2009)
- Management of Urban Stormwater Impacts Policy (2009)
- Public Environmental Awareness, Education and Training Strategy (2011)
- Responsible Tourism Policy for the City of Cape Town (2009)
- Water Conservation & Water Demand Management Programme / Strategy (2007, updated 2014/15)

More details of these by-laws, policies, plans, and strategies are provided in Annexure E.

9. Partnerships and collaborative working

Beyond the national regulatory context, given the complexity of climate change challenges, the City recognises that the effectiveness of this policy requires a 'whole of government' and 'whole of society' approach. Partnerships and collaborative working are, therefore, crucial to the implementation of this policy.

In this light, the City has committed to and holds membership of various international agreements, conventions and organisations, detailed further below. In addition, the City engages and needs to ensure effective partnerships with various other stakeholders at a national, provincial and local level.

9.1. International agreements, conventions and membership

The City of Cape Town also plays a role in supporting and implementing climate change related international agreements, conventions and organisations, either as a direct signatory, or through its role in supporting national commitments.

The City, led by the Executive Mayor, has played a key role in a number of international climate-related associations (detailed below) including the C40, the Covenant of Mayors, and more recently the Global Commission on the Economy and Climate. These institutions are useful for the purposes of sharing best practice among leading cities and for advocating for improved regulations related to climate measures from national governments. The very existence of city-focused organisations is an acknowledgement of the unique role that cities play in mitigating and adapting to climate change, irrespective of the state of action by nation states.

Participation on the part of the City in international events is measured and reported on in acknowledgement of the fact that contributing to global solidarity is important part of the City's climate change response.

The following are those the City is currently engaged with:

Agreement/ convention/ partnership	Year	Description
Global Parliament of Mayors	2016	The Global Parliament of Mayors is a governance body of, by and for mayors from all continents. The global city rights movement. Mayors cooperate on cross cutting critical issues, with climate change being one of the key focus areas. Mayor Patricia de Lille chairs this international organisation (from March 2017).
Compact of Mayors (merged into Global Covenant of Mayors for Climate and Energy in 2016)	2015	The Compact of Mayors is run under the leadership of the world's global city networks – C40 Cities Climate Leadership Group (C40), ICLEI – Local Governments for Sustainability (ICLEI) and the United Cities and Local Governments (UCLG) and establishes a common platform to capture the impact of cities' collective actions through standardized measurement of emissions and climate risk, and consistent, public reporting of their efforts. In 2015 The City of Cape Town complied with the planning and reporting requirements of the Compact of Mayors.

C40 Climate Leadership Group	2014	C40 is a climate leadership group that works to empower cities to connect with each other and share technical expertise on best practices. The C40 Group convenes thematic sub-networks of cities with common goals and challenges, many of which the City actively participates in ⁴⁵ .
50 Municipal Climate Partnerships Programme	2014	The City of Cape Town has been involved in an energy and climate partnership with Munich since 2014 as part of its participation in the 50 Municipal Climate Partnership Programme.
Mistra Urban Futures	2012	An international partnership (funded by Mistra and Swedish International Development Agency (SIDA)) and between a number of cities focusing on urban sustainability, including climate change.
Durban Adaptation Charter (DAC)	2011	The DAC is an agreement signed at COP 17 to adapt to climate change and to assist communities to respond to and cope with climate change risks, thereby reducing vulnerability ⁴⁵ .
Carbon Disclosure Project	2010	The City reports into the C40 Climate Leadership Group through the CDP's Cities Programme, which provides a voluntary climate change reporting platform for city governments and businesses.
Mexico City Pact	2010	A pledge by various cities to address climate change via mitigation and by fostering city-to-city cooperation. Reporting is undertaken through the carbonn Cities Climate Registry. ⁴⁶
Cape Town – Aachen Partnership ⁴⁷	2001	A partnership between various organisations (NGOs and CSOs) in Cape Town and Aachen (Germany), facilitated by the City of Cape Town and focusing on Local Agenda 21 and related projects (sustainable livelihoods, arts and culture and resource efficiency).
ICLEI – Local Governments for Sustainability	1994	ICLEI-Local Governments for Sustainability is an international network of over 1000 cities, towns and metropolises committed to building a sustainable future. The City of Cape Town is the oldest member in Africa and was the original host to the ICLEI Africa Secretariat. ICLEI is also the official Local Government and Municipal Authorities focal point within the UNFCCC and represents cities at a global level in this role.

⁴⁵ The C40 Good Practice Guides identify nearly 70 categories of good practice for climate change actions in energy, transport, solid waste management, urban planning, adaptation and finance:

http://www.c40.org/other/good_practice_guides

⁴⁶ Mexico City Pact registry: <http://carbonn.org/data>

⁴⁷ <http://aachen-kapstadt.de/>

9.2. National, provincial and local partnership approach

In order to develop and strengthen the City's partnership approach to addressing climate change, partners need to be proactively engaged with to identify who needs to work together and who is best placed to effectively implement each component of the policy and the policy as a collective whole. While this policy is a City administration policy, it has sought and received input from multiple stakeholders to enable alignment on the vision. The City will aim to increasingly work with all stakeholders to empower them and to remove barriers as and when necessary in order to collectively solve climate change related problems.

Focus needs to be given to identifying and working on specific issues around which stakeholders can reach agreement and work together, despite differences, through the identification of common interests, such as updating research.

The City engages and looks to strengthen engagement with a number of inter-governmental forums and departments to enable the implementation of this policy and to ensure alignment with and contribution towards South Africa's international commitments.

On a national level, these include the following:

National Departments

- Environmental Affairs
- Energy
- Water and Sanitation
- Human Settlements
- Transport
- Agriculture, Forestry and Fisheries
- Trade and Investment
- Economic Development
- Health
- Public Works
- Science and Technology
- Cooperative Governance (including Disaster Risk Management)
- National Treasury (including the Cities Support Programme)

National Associations

- South African Local Government Association (SALGA)
- South African Property Owners Association (SAPOA)
- World Wildlife Fund (WWF) SA
- South African National Energy Development Institute (SANEDI)
- National Business Institute (NBI)
- Green Building Council of South Africa (GBCSA)
- South African Wind Energy Association (SAWEA)
- South African Photovoltaic Association (SAPVIA)

Key national forums that relate directly to climate change, such as the City's Resilience Forum and Urban Energy Support are also actively engaged with, allowing for alignment with national, provincial and local level policy and actions, particularly with other South African cities. The City also works with State Owned Enterprises such as Eskom. In addition, engagement with provincial

partners, forums and departments, such as the Western Cape Climate Change Forum, the Energy Game Changer and GreenCape is also key.

Further to the above is the need to establish and strengthen existing cross-sector collaborations with other Western Cape municipalities (to deal with inter regional challenges, such as water supply and agriculture) and with the business sector,⁴⁸ civil society and academic institutions in order to support policy execution.

Local partnerships exist with many key academic institutes (including the University of Cape Town's Energy Research Centre, African Climate and Development Initiative, African Centre for Cities, the Climate Systems Analysis Group, the Cape Peninsula University of Technology, and the University of Stellenbosch), NGOs (including Sustainable Energy Africa and others), and business groups (including Accelerate Cape Town, the Cape Chamber of Commerce, the Cape Town Partnership, and the City-run Commercial Energy Efficiency Forum).

10. Implementation framework

While implementation of the Policy will be guided and monitored by a City climate change co-ordination function the implementation of the Climate Change Policy will be undertaken by multiple line functions within the City.

It is recognised that working across multiple line functions is required in order to effectively mainstream policy principles into all areas of work. While this policy includes incremental steps towards implementation, it also highlights areas requiring significant transformation in ways of working and making decisions. While incremental steps and small adjustments are easier to achieve, especially in the short-term, the City acknowledges that it needs to be aiming at and working towards reaching positive tipping points that trigger deeper changes.

To enable this move towards transformative change and to aid transversal working, the City is increasingly making use of evidence based tools, such as carbon footprinting, and life cycle and cost benefit analyses in order to fully assess carbon impacts and climate resilience at project, programme, systems and City level. This evidence based approach will enable the prioritisation of interventions. Key to transversal working will be the provision of regular climate science updates in order to improve understanding of the risks that the City faces at a collective level and working to find solutions that meet the needs of all areas of service delivery.

As is outlined in the section on partnerships, the Policy relies on partnerships with international, national, provincial and local governments, as well as with business, civil society, academia and others. The City will work with these partners to collectively understand and agree on likely risks, levels of adaptive capacity, strengths, and roles that each can play in contributing towards the realisation of this Policy.

Addressing climate change in the face of uncertainty (of the exact timing, magnitude and frequency of changes) will be an ongoing challenge, but one that can be overcome through updating climate data when possible, building flexibility into how the City delivers services and makes decisions, improving transparency with regards to what the City knows or does not know,

⁴⁸ such as the City's Commercial Energy Efficiency Forum and agricultural bodies

moving to decentralised or alternative service delivery methodologies where appropriate, and ultimately through implementing ambitious and innovative climate change response measures.

The transversal implementation of the Policy will be supported by the relevant City transversal working groups and enabled through the development and revision of relevant action plans, including (but not limited to) a revised Climate Change Adaptation Action Plan and a new Climate Change Mitigation Action Plan. These action plans, on which the City will engage closely with external stakeholders to strengthen synergies, aim to prevent duplication and enable prioritisation, and will illustrate which interventions are cross sectoral, the prioritisation of actions, the approach used to achieve this prioritisation, responsibilities, and timeframes.

Climate change will form a core consideration of all City projects and the application of this Policy's principles within line departments will mainstream the use of departmental budgets to address climate change. In addition, the City will work to access additional climate change project specific funding including, where appropriate, innovative finance mechanisms such as climate or green bonds.

To facilitate effective decision-making, the City will commit to the following:

- production of an updated and locally relevant climate science report every two years
- regular updates of hazard, vulnerability and risk assessments
- regular updates to climate change scenario planning
- regular state of energy reporting
- ongoing research to stay up to date with best practice information relating to adaptation and mitigation interventions, approaches and technology from Cape Town and elsewhere.

This information will be shared with all relevant transversal management work groups and committees of Council, as well as external stakeholders in the interests of collectively responding to climate change and updating this Policy and the underlying action plans.

11. Monitoring and evaluation

A monitoring and evaluation (M&E) system, including institutional structures and responsibilities, will be put in place to ensure the ongoing implementation of this policy across the City. The M&E system will consist of the following elements:

11.1. Use of appropriate tracking tools

The tools discussed in the Implementation section, such as carbon footprinting, and life cycle and cost benefit analyses that will be used in order to fully assess carbon impacts and climate resilience at project, programme and City level, will also be used to track progress of this Policy. This will enable frequent feedback of progress in order to continually adjust, scale up and improve interventions and the City's policy approach as needed. Innovative tools, such as social audits, will also be considered.

11.2. Integration with City organisational performance management tools

The City climate change co-ordination function will liaise on an ongoing basis with relevant line departments in order to promote the integration of this policy and its principles and directives into the Integrated Development Plan, Service Delivery and Budget Implementation Plans, business

plans, and other performance monitoring tools. Targets for implementation may be developed as part of this process.

11.3. Annual progress reporting to committees, Council and external stakeholders

An annual progress report will be compiled, detailing the uptake and implementation of the policy and implementation framework to date including the Climate Adaptation Plan of Action and the Sustainable Energy Action Plan, based on the Climate Change Policy M&E system. This will be submitted to relevant committees and Council and will note areas of success and challenges, as well as recommendations for future adjustments to the policy or its associated plans and tools.

The progress report will also be distributed to external stakeholders for information, feedback and engagement and for technical review in the interests of transparency and strengthening partnerships. As part of this, any progress reporting will contribute to tracking of indicators in the Western Cape Climate Change Monitoring and Evaluation reports and the national government's Nationally Determined Contributions report.

11.4. Regular policy review

This policy will be reviewed two years after the date of adoption, or as and when necessary and may be updated and revised accordingly. Lessons learned from the annual progress report will contribute to the review and revision process. The policy review process will include input from external stakeholders.

12. Notes

ⁱ The Intergovernmental Panel on Climate Change (IPCC) is the most authoritative and highly scrutinised, international body on climate science. More than 2 000 scientists worked on the latest assessment report (AR5 2016) over the past five years and it has been reviewed by government, industry, and environmental groups from 55 countries.

ⁱⁱ The planet takes several decades to respond to increased CO₂ levels due to the thermal inertia of the oceans. The mass of the oceans is around 500 times that of the atmosphere. The time that it takes to warm up is measured in decades. Because of the difficulty in quantifying the rate at which the warm upper layers of the ocean mix with the cooler deeper waters, there is significant variation in estimates of climate lag. Ice sheets also take a long time to respond to the transport of heat into the oceans. Some changes in the climate system would be effectively irreversible. For example, major melting of the ice sheets and fundamental changes in the ocean circulation pattern could not be reversed over a period of many human generations. The threshold for fundamental changes in the ocean circulation may be reached at a lower degree of warming if the warming is rapid rather than gradual.

^{iv} The Paris Agreement's central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C. While 2°C is the limit agreed to in the Paris Agreement, science has shown that the average annual increase in temperature needs to be limited to under 1.5°C to significantly reduce the risks and impacts of climate change

∨ The DAC commits Local Governments to local climate action in their jurisdiction that will assist their communities to respond to and cope with climate change risks thereby reducing vulnerability by working to provide key information into local government development planning; ensuring that adaptation strategies are aligned with mitigation strategies; promoting the use of adaptation that recognizes the needs of vulnerable communities and ensuring sustainable local economic development; prioritizing the role of functioning ecosystems as core municipal green infrastructure; and seeking innovative funding mechanisms.

Annexure A: Projected Impacts

Despite progress such as the 2015 Paris climate agreement, cumulative international pledges on carbon emissions reductions still remain far lower than what is required to avoid dangerous climate change. As of 1 November 2015, a substantial gap remains between the levels of emissions in 2025 and 2030 projected in the NDCs submitted to the UNFCCC and the lower levels that would be consistent with the temperature goal in the Paris Agreement. The struggle of national governments to fully address climate change makes the role of regional and local government all the more indispensable.^{1 2} In addition, by 2030, two-thirds of the world's population will be living in cities, the urban population in developing countries will double, and the area covered by cities could triple.³

The impacts of climate change are already being experienced worldwide, with major impacts on economies, society and the environment. Left unchecked, climate change has the potential to affect health, infrastructure and natural systems. The first stages of warming have already started placing essential ecosystems at risk, and will strain the ability of the world's economies and governments to respond. "Beyond 2 degrees Celsius, in the second half of this century and later, the effects of further warming – which will certainly occur in the absence of ambitious mitigation efforts – will be much more dangerous, as all potential benefits vanish and all regions suffer steadily increasing harms".⁴ According to the ACDI (2016) "Climate change poses a significant threat to South Africa's water resources, food security, health, infrastructure and ecosystem services and biodiversity. In a country where many people are poor and where levels of inequality are high, these effects of climate change are critical challenges to development."

In Cape Town projected changes will, and already do, lead to first order impacts such as flooding, infrastructure damage, decreased water supplies or economic losses through extreme or slow onset events where the climate is the direct cause. These in turn lead to second order impacts on health, agricultural productivity, displacement of people from homes, water quality, increased wildfires, biodiversity loss, food security and an increased need for disaster management intervention; weather extremes or specific conditions are thus contributors or aggravators of existing problems. Lastly, third order impacts are currently and will be increasingly experienced, where climate causes behaviour changes that increase impacts / risk, such as decreased worker productivity, increased use of air conditioning (which places strain on electricity supply), increased insurance premiums, increased social unrest, and increased in-migration.⁵

Human-induced climate change has been identified by the United Nations as "the largest, most pervasive threat to the natural environment and human rights of our time."⁶ According to the World Bank: *'Climate change is a serious challenge for cities around the world, particularly in developing countries where urbanization is happening at neck-breaking speed. It threatens to increase vulnerabilities, destroy economic gains, and hinders social and economic development. The urban*

¹ Climate Action Tracker. 2016

² Paragraphs 133-136 of Paris Agreement (2015) refer to the role of sub national governments: 133. Welcomes the efforts of all non-Party stakeholders to address and respond to climate change, including those of civil society, the private sector, financial institutions, cities and other subnational authorities; 134. Invites the non-Party stakeholders referred to in paragraph 133 above to scale up their efforts and support actions to reduce emissions and/or to build resilience and decrease vulnerability to the adverse effects of climate change and demonstrate these efforts via the Non-State Actor Zone for Climate Action platform; 135. Recognizes the need to strengthen knowledge, technologies, practices and efforts of local communities and indigenous peoples related to addressing and responding to climate change, and establishes a platform for the exchange of experiences and sharing of best practices on mitigation and adaptation in a holistic and integrated manner; and 136. Also recognizes the important role of providing incentives for emission reduction activities, including tools such as domestic policies and carbon pricing

³ UN HABITAT, 2016

⁴ Ackerman, F. & Stanton, E. (2006). p.1.

⁵ CSAG. 2016

⁶ UN, 2015

poor will bear the brunt of its effects since they live and work in informal settlements that are more exposed to hazards'.⁷

The City of Cape Town currently experiences all of the above climate impacts and climate-related risks. A significant proportion of Cape Town's coastline is highly developed – in some cases within 100m of the high water mark - leaving it highly exposed to sea level rise, storm surges and dynamic processes linked to shifting wind regimes. Flooding in low lying areas is an annual event, particularly in informal settlements with limited drainage infrastructure and challenges with solid waste. Even formalised areas with good infrastructure regularly experience flooding and disruptions to traffic and other activities, and coastal areas of the city are increasingly being eroded by storm surges.

Twelve disasters associated with fourteen identifiable cut-off low (COL) weather systems were recorded in the Western Cape between 2003 and 2014 (Pharoah et al., 2016). As a result, government departments and municipalities incurred flood-related damage worth R 4,9 billion. Of this, R 2,3 billion was attributed to agricultural costs. For the study period, the City reported municipal damage of R 6 456 136 for one COL associated disaster event. According to Pharoah et al (2016), the frequency of recorded disasters indicates that high impact weather conditions and damaging floods are no longer 'rare events'. Rather, these events occur almost annually, with extensive and recurrent financial losses.

A decrease in water resource availability to industry and agriculture will have negative effects on keystone systems like the food system in the greater city region and Western Cape as a whole. Rain-fed and irrigated agriculture forms the bulk of South Africa's food requirements and contributes to food security through employment creation, trade and foreign earnings; a decrease in water supply will therefore have negative impacts on the functioning of this system. Food security and adaption to climate change are mutually supportive policy outcomes, and it is recognized that the issues therefore need to be considered together.⁸ Climate change is also expected to disproportionately affect the food security of the poor.

Projections of the likely economic damage caused by climate change, by assuming a diminishing discount rate, under-estimate possible damages. Nicholas Stern, the leading climate economist notes that "current economic models tend to underestimate seriously both the potential impacts of dangerous climate change and the wider benefits of a transition to low-carbon growth."⁹

All of these projected impacts will have a negative impact on the City's ability to achieve existing development goals as embedded in the five pillars of the Integrated Development Plan¹⁰ and will likely affect Cape Town's vulnerable communities the worst.

⁷ World Bank, 2011

⁸ United Nations 2015

⁹ Stern, N, 2016

¹⁰ The opportunity city, the safe city, the caring city, the inclusive city and the well-run city

Annexure B: Work undertaken to date by the City of Cape Town

1. Preparing for change

Various disaster risk assessments have been undertaken by the City that highlight climate change as being high in the list of hazards. Work undertaken by the City to prepare for change has largely taken place under the banner of the City's nine sectoral Climate Adaptation Plans of Action (CAPAs). Projects implemented as part of these CAPAs have included:

Water

- The implementation of a water conservation and water demand management programme, including leak repairs and detection, pressure management, upgrading of distribution pipes, improved metering, behaviour change, tariffs and pricing, grey water reuse, effluent recycling, and water restrictions .
- Feasibility studies for diversifying surface water suppliers (e.g. Berg River) and accessing alternative water supplies (e.g. groundwater, desalination, treated effluent).

Disaster risk management

- Mapping of informal settlements at high risk and vulnerable to flooding so as to target the implementation of flood protection interventions
- The inclusion of water sensitive urban design principles in DRM policies
- An agreement between the South African Weather Service (SAWS) and the City's disaster risk management function for the onward notification and transmission of early warnings (e.g. for floods, storms surges, heat waves, high fire index, gale force winds, etc.) to the general public and City departments by way of various channels.
- An intensive city-wide programme of public education and awareness, that includes interacting with vulnerable and at risk communities. Fire and flood wise programmes have been implemented and are continuing among high risk communities and climate change and energy programmes have been introduced in participating schools. Two day Community Based Risk Assessment Workshops have been organised with high risk communities on an on-going basis, as another initiative to improve understanding of hazards, reduce risk and strengthen community resilience.

Coastal management

- The development of an Integrated Coastal Management Policy and Plan;
- Defined coastal management lines (coastal urban edge) for the entire Cape Town coast.
- Coastal Management by-law drafted
- The mapping of coastal areas at risk from storm surges and sea level rise
- Various studies to clarify governance issues around coastal zone management in the face of climate change
- Undertaking of collaborative studies to assess adaptation options on coastal areas already impacted by storm surges.

Stormwater management

- Detailed flood mapping / modelling of two key catchments to include climate change projections
- An increase in the diameter of new stormwater pipes to accommodate an increase in rainfall intensity
- The inclusion of water sensitive urban design principles in key policies to manage stormwater while capturing water for future supply needs

- Ecosystem based adaptation in conjunction with hard engineering for Sir Lowry's Pass and Lourens river system

Transport

- The identification of transport and infrastructure and networks potentially at risk from climate change;
- The implementation of sustainable design and construction of roads to withstand climatic changes such as increased temperatures and flooding;
- South Peninsula Transport Corridor risk assessment and intervention to reduce impacts of storm surge and wind-blown sand on coastal railway and road

Spatial planning

- The development of a framework of Resource Efficiency Criteria for Development in Cape Town;
- Review of the City of Cape Town Spatial Development Framework (SDF) from an adaptation perspective to ensure that climate change adaptation considerations were adequately incorporated into the SDF review 2016/17.

Human settlements

- Incorporating national building standards including adaptation measures into human settlements

Biodiversity

- Development and implementation of the City's Local Biodiversity Strategy and Action Plan and biodiversity network (BioNet)
- The implementation of an effective invasive plant species management programme
- The development of an Atlantis land bank to facilitate development while enabling the implementation of the BioNet.

2. Reducing GHG emissions and creating a more energy efficient city

Work undertaken by the City to reduce GHG emissions has largely taken place under the banner of the City's Energy and Climate Action Plan (ECAP), which is informed by the City's State of Energy Reporting and Energy2040 Goal, and implemented by key line functions, such as Air Quality Management, Energy and Transport and includes:

Renewable energy and city-wide energy efficiency

- Small scale embedded generation is actively supported by the City of Cape Town and the municipality has a feed-in tariff with the first large scale customer being signed up in 2014.
- The City of Cape Town and Western Cape Government are collaborating on an Energy Game Changer programme to proactively drive energy efficiency and a rapid diversification of the energy supply mix.
- The Darling Wind Farm Power Purchase Agreement (this preceded current legislation which forbids municipalities from engaging in this kind of PPA) and pursuing approvals for local government to enter into new large scale Power Purchase Agreements (PPAs)
- Liquefied natural gas supply to the Western Cape
- Landfill gas and biogas from anaerobic treatment of sewage sludge and organic waste / flaring (with carbon trading where feasible)
- The Atlantis Special Economic Zone to support 'Greentech' companies

- The City of Cape Town's Electricity Savings Campaign for commercial and residential sectors includes a solar water heater service provider accreditation programme, a PV 'Safe and Legal' programme and a commercial Energy Efficiency Forum
- A ceilings retrofit programme in low cost housing with health, social, and energy efficiency benefits is ongoing.
- Sustainable electrification: a Low Income Energy Services Strategy has been developed by the City to support and co-ordinate all the current low income energy services programmes, businesses, and areas of work.

Renewable energy and energy efficiency in municipal operations

- The City of Cape Town is leading by example by implementing energy efficiency retrofit programmes within municipal operations since 2009. This includes traffic lights, street lights, buildings and wastewater treatment plant retrofits. The buildings energy efficiency programme is further complemented with rooftop solar photovoltaic systems. This is accompanied by energy management training for facilities staff, smart driver training for fleet and behaviour change programmes for building users.
- The City has also developed an Internal Resource Management protocol for implementation across municipal operations and a resource data management system to track, monitor and report savings and consumption.

Transport

- Development and rollout out of Phase 1 and the N2 Express service of the MyCiTi but network in support of the Integrated Public Transport Network (IPTN). Phase 2A planning is underway.
- Roll-out of a long term city-wide Non-Motorised Transport (NMT) programme, which started in 2010 and is aligned with road and rail based transport network.
- The development of a Cycling Strategy, which aims to increase the mode share of cycling and contribute towards a reduction in congestion and emissions in the City by 2030.
- Detailed design and planning underway for Transit Oriented Development (TOD), enabling the creation of greater density and mixed use development along public transport routes.
- Actively working with partners to improve integration between MyCiTi, the rail service, the bus service and the mini-bus taxi industry, including a signed Memorandum of Action with PRASA (2014).
- Development of a Travel Demand Management (TDM) Strategy, which aims to influence travel behaviour in order to reduce peak period car travel (particularly single occupancy vehicles); shift modal share towards public transport and NMT; and reduce energy consumption and emissions.
- TDM projects implemented to date include the upgrade of rail Park-and-Ride facilities and the roll-out of the City's travel behavioural change programme (Travel SMART). New TDM projects to be rolled out include the Flexible Working Programme and the development of high occupant vehicle priority strategies such as carpooling.

City operations:

- As part of the City's Fleet Greening Programme, a number of projects have been initiated, including SMART driver training; diesel emissions testing; alternative fuels and vehicle technologies such as biofuels and the roll-out of a pilot electric bus project, of which the energy requirements will be offset by solar PV.

Air quality management

- Administering the Atmospheric Emission Licencing¹¹ process.¹² The licensing measures¹³ include enforcing compliance with the minimum emission standards by industries through annual stack emissions testing of the listed activity specific pollutants, as a mechanism for ensuring emissions reduction.
- Air Quality Management Unit staff members were also appointed as Environmental Management Inspectors enabling them to perform compliance and enforcement actions on listed activities.
- The regulation of industrial fuel burning equipment and open burning, in terms of the City of Cape Town Air Quality Management Bylaw also contributes towards Climate Change response initiatives through the synergistic beneficial impacts on the emission of climate forcing agents such as black carbon.¹⁴

3. Climate Change awareness

Various climate change related awareness and advocacy campaigns have been run through the Cape Town Climate Change Coalition¹⁵, Climate Smart Cape Town¹⁶, the Electricity Savings Campaign¹⁷ and the Smart Living and Working Programme¹⁸, amongst others.

¹¹ All regulated Listed Activities declared as such by the Minister of Environmental Affairs, in terms of Section 21 of the NEM: Air Quality Act, are required to be in possession of an Atmospheric Emission Licence in order to operate and be legally compliant.

¹² i.e. once newly proposed listed activities have undergone an Environmental Impact Assessment with specialist air quality studies, and have been awarded Environmental Authorisation by the EA competent authority, the City's Air Quality Management Unit processes the Atmospheric Emission Licence and either grants or refuses the licence.

¹³ Atmospheric Emission Licences prescribe specific conditions of authorisation aimed at addressing and minimising emissions to atmosphere from point, area and line sources. The licence also prescribes the maximum permissible emission limits and monitoring and reporting requirements and time frames. The Listing Notice has adopted a phased approach in achieving emission reduction. All existing plants had to meet the Minimum Emission Standards (MES) by 1 April 2015; and then ensure compliance with the stricter 2020 MES by 1 April 2020. All new plant (established after 2010) have to meet the 2020 MES with immediate effect..

¹⁴ Black carbon is a major component of soot and is produced by incomplete combustion of fossil fuel and biomass. It is emitted from various sources including diesel cars and trucks, residential stoves, forest fires, agricultural open burning and some industrial facilities.

¹⁵ The Cape Town Climate Change Coalition was launched in 2011, it represents an alliance of organisations and partners, including private sector, governmental and non-governmental organisations, researchers and educators, who came together to support Cape Town's bid to host COP 17. The partners agreed to continue working together to build Cape Town citizens' understanding of and commitment to managing energy and climate change issues in a resilient manner.

¹⁶ Climate Smart Cape Town is a campaign to help residents of Cape Town learn about climate change and how they can take action, as well as to learn about the actions already being taken by the City of Cape Town and other leading public and private sector organisations to mitigate and adapt to climate change.

¹⁷ The City of Cape Town's Electricity Savings Campaign encompasses a social marketing campaign, an Accredited Solar Water Heater Programme aimed at residents (see www.SavingElectricity.org.za) and an Energy Efficiency Forum for the commercial sector (led with partners).

¹⁸ The City of Cape Town's Smart Living and Working Programme (launched in 2007) aims to make sustainable living and working a reality in Cape Town. This is achieved through the implementation of numerous projects and development and distribution of resources, in partnership with other City line departments as well as external partners.

Annexure C: Strategic intent / alignment

The outcomes, principles and directives articulated in the Climate Change Policy support the strategic vision of the City of Cape Town (as articulated in the IDP). Strategic alignment to the IDP as well as to key high level City strategies (including the Economic Growth Strategy, the Social Development Strategy, the Environmental Strategy and the TOD Strategic Framework) is outlined below.

1. Integrated Development Plan 2012 – 2017 (IDP)

The strategic focus areas of the City are enshrined in the City's Integrated Development Plan (IDP) and are categorised into five pillars. Climate change mitigation and adaptation offer opportunities and support across all five pillars.

- **The Opportunity City:** Addressing climate change could have multiple economic benefits. These include:
 - Reducing energy and water consumption intensity and costs, freeing up income and allowing for economic growth and sustainability.
 - Enabling businesses to prepare for and avoid potential climate change risks.
 - Minimizing risk to infrastructure.
 - Providing significant economic growth opportunities (such as in the renewable energy industry).
 - Improving natural resource stocks, such as fisheries, to sustain key industries.
 - Supporting the growth of an effective public transport system, reducing traffic congestion and emissions while enabling people to get to work easily, effectively, timeously and affordably.
- **The Safe City:** Reducing risks to lives, health and property and moving towards proactive disaster risk management.
- **The Caring City:**
 - More energy efficient and adaptation appropriate human settlements, with public transport improving socio economic conditions.
 - Supporting sustainable urban agriculture so as to ensure food security
 - Minimising flood risk and engaging with the insurance industry to address costs of property damage.
- **The Inclusive City:** Establishing and strengthening partnerships with all sectors to ensure a resilient city and build adaptive capacity.
- **The Well-Run City:** Ensuring that service delivery reduces the city's carbon footprint and improves the resilience of the city in an optimal and financially sustainable manner. Maintaining infrastructure to ensure optimal functioning in time of increased climatic pressures.

2. Economic Growth Strategy

The Economic Growth Strategy (EGS) recognises that the economy will face considerable challenges brought about by climate change. The notion of perpetual economic growth, without a focus on resource sustainability, has been a key driver of climate change and therefore non-consumptive, non-extractive growth options have to be facilitated to align this strategy with the Climate Change Policy. Effective environmental resource management, together with climate change adaptation and mitigation measures, must, therefore, be core component of any forward-looking approach to economic growth and risk reduction. The EGS not only sees effective resource

management as important for sustaining existing income-generating activities, but also sees mitigation and adaptation as opening new opportunities for investment and new avenues for growth and job creation, such as businesses in water harvesting, indigenous planting, cycle lane design, close loop material management, market gardens, shade tree planting etc.

The Climate Change Policy supports the overall implementation of the EGS, as well as the following high-level strategic areas.

Strategic area 2: Providing the right basic service, transport and ICT infrastructure

Strategy 4: Expand public transport and consolidate integration process

- Many people are separated from the city's economic hubs, with the result that many increasingly experience high levels of congestion and lengthy commuting times; these challenges reduce competitiveness and productivity in the economy.
- The Climate Change Policy supports this section of the EGS by
 - Pursuing the improvement of accessibility, affordability, reliability, and safety of public transport.
 - Encouraging a modal shift and supporting or providing systems in favour of public and non-motorised transport (NMT) and reducing the demand of private vehicle use, particularly single occupancy vehicles;
 - Encouraging mixed-use densification and reducing travelling distances and the overall need to travel.
 - Requiring that building and site development plans consider the promotion and use of public transport and NMT.

Strategy 6: Maintain and upgrade basic service infrastructure to ensure sustainability

- Basic service or 'bulk' infrastructure is fundamental to the City's role as the primary provider of essential services such as electricity, water, and waste management. Without these, achieving other strategic goals, notably economic growth and job creation, would be impossible. However, the City faces numerous challenges in maintaining and upgrading basic infrastructure. Rapid urbanisation is putting pressure on the City's existing stock, while financial, capacity, and environmental considerations limit options going forward.
- The objective of reducing long-term costs by adopting a holistic life-cycle approach to managing infrastructure assets is supported by the Climate Change Policy as it considers long term impacts and benefits in planning and decision making, specifically by considering life-cycle costs.

Strategic area 3: Utilising work and skills programmes to promote growth that is inclusive

Strategy 5: Broaden job opportunities via the Expanded Public Works Programme

- Through the Expanded Public Works Programme (EPWP), the City creates work opportunities for low-skill and semi-skilled people. The EGS aims to align the EPWP programme with the City's infrastructure development goals and create many more job opportunities.
- The Climate Change Policy supports this strategy by stimulating job creation in mitigation and adaptation interventions; and encouraging investment in related skills development (due to the nature of the work this would likely operate through the EPWP programme).

Strategic area 5: Ensuring that growth is environmentally sustainable in the long-term

Strategy 1: Develop and implement a comprehensive green economy work programme

- The emergence of commercially viable green enterprises with job-creating potential (such as manufacturing of environmentally-conscious goods and industrial activities that support lower carbon emissions e.g. renewable energy) must be supported.

- The Climate Change Policy supports this strategy through promoting investigating, enabling, investing in, and implementing innovative climate change responses and related technologies; as well as by promoting the socio-economic benefits that may arise from responding to climate change.

Strategy 2: Manage water conservation, supply and demand to ensure sustainability

- Ensuring sustainability of supply and managing demand to reduce wasteful consumption and encourage efficient use is essential in ensuring sustainable water utilisation.
- The Climate Change Policy supports a number of objectives under this strategy, by supporting improved resilience and reduced vulnerability, and promoting climate change conscious urban design and infrastructure, both of which have strong connections to water conservation, supply, and demand management.

Strategy 3: Investigate options for energy diversification and promote energy efficiency

- In a context of rising electricity prices, it is imperative that the City facilitates a shift towards reduced energy consumption and greater energy efficiency in the Cape Town economy while also investigating options for diversifying the city's power sources to ensure the energy security needed to fuel economic growth in the future.
- The Climate Change Policy relates strongly to this strategy of the EGS, as the policy promotes energy efficiency and more sustainable energy in all sectors of the economy, in its urban form, development, and appropriate levers.

Strategy 4: Protect environmental assets and sustain and expand the eco-tourism sector

- Tourism is a key sector in Cape Town and a large proportion of visitors are drawn to Cape Town's eco attractions.
- The Climate Change Policy supports the objectives of the EGS to work with all relevant stakeholders to protect Cape Town's environmental assets and ensure proper management of Cape Town's coastal areas, through its approach to retain, restore, expand, and optimise ecological/green infrastructure.

3. Social Development Strategy

The Climate Change Policy aligns with the Social Development Strategy (SDS) by promoting the reduction of the negative impacts of a changing climate and inappropriate development on communities, businesses, and individuals.

The Climate Change Policy specifically supports three high-level objectives (and related levers) of the SDS.

Build and promote safe household and communities

Continue to reorient service delivery to create and maintain safe and healthy environments

- The City utilises its regulatory and service delivery functions in order to maintain personal safety and public health as well as manage risks and disasters. People with low incomes often live in high densities on the periphery of Cape Town or in marginal, generally unsuitable areas, which are vulnerable to flooding. In addition, fire and disease is more prevalent in dense areas of Cape Town. More resources need to be allocated to these areas to make them safer, cleaner, and prevent fires, flooding, and disasters. This reorientation of service delivery requires a careful balancing of resources that ensures all people in Cape Town receive the necessary services, but those that are more vulnerable receive services that enable them to live in a clean, healthy, and safe environment.

- This lever is supported through adaptation and mitigation approaches to reduce the impacts of climate change on communities, such as flood protected, better insulated, and more energy efficient homes, as promoted by the Climate Change Policy.

Support the most vulnerable through enhancing access to infrastructure and social services

Continue to reorient service delivery so it is pro-poor

- Access to services and infrastructure is important in its own right as it improves quality of life and is vital for poverty reduction. Any intervention should at the very least leave the poor no worse off, and should improve the position of the poor, if possible.
- With poorer communities being most vulnerable to climate change, the Climate Change Policy highlights the importance of understanding and reducing these impacts.

Provide free primary health care including HIV & TB care

- The City plays a role maintaining a healthy environment and provides facilities and opportunities for people to make healthy choices and take responsibility for maintaining their own well-being. A commitment to designing City environments that promote healthy lifestyles in terms of spaces to walk or cycle is a way that the City provides opportunities for active living. Safe green space can have a positive influence on physical and mental health, especially in the young and lower socioeconomic groups¹⁹, and access to green space can support motor skills, cognitive, emotional, social, and physical development in children²⁰.
- The Climate Change Policy supports this lever by promoting ecosystems-based adaptation approaches that include the maintenance and use of natural areas and public open spaces and by promoting non-motorised transport.

Facilitate access to housing opportunities as asset-building

- Informal settlements are associated with inadequate facilities and non-conformity with building regulations, which makes people vulnerable to disease, temperature extremes, fire, and flooding.
- The Climate Change Policy supports this lever by promoting the reduction of vulnerability through the development of well-located, compact, and connected human settlements that are resource efficient and adaptive to climatic events.

Promote and foster social inclusion

Address spatial segregation through transport and planning

- Getting people to jobs by making it easier and cheaper to commute through an effective, efficient transport system; and getting jobs to people through urban renewal and upgrading programmes; supports the Climate Change Policy by contributing to a low-carbon, resource efficient development path.

Promote and foster social interaction through recreational and active citizenship opportunities

- The City will work to ensure that new developments and upgrading of existing developments provide spaces, facilities and opportunities for social integration, where possible.
- The Climate Change Policy supports this lever by promoting multi-functional ecosystems-based adaptation approaches in new and existing developments. In addition, the Policy promotes the principle of providing climate change related communication and awareness so as to enable citizens to make informed decisions regarding their actions and behaviours, prepare for

¹⁹ Thompson, C., 2015

²⁰ Thompson, C., 2015

potential risks and impacts, and understand the climate change challenges and opportunities that the City is dealing with.

4. Environmental Strategy of the City of Cape Town (draft)

The Climate Change Policy supports three of the strategic focus areas within the Environmental Strategy (and multiple tools within the implementation framework of the strategy), namely:

- Natural systems planning and management, focusing on the management of natural resources and natural systems;
- Resource management and efficiency, focusing on the effective management of Cape Town's natural resources (e.g. water, energy); and
- Environmental quality management, focusing on the prevention and control of environmental degradation and enhancement of environmental quality.

In addition to being one of the cross-cutting themes that underlie the strategic focus areas, the Climate Change Policy also supports the other cross-cutting themes, namely:

- Green economy as defined by the City of Cape Town – *'Expanded economic opportunities²¹ through the provision of goods and services and the use of production processes that are more resource efficient, enhance environmental resilience, optimise the use of natural assets and promote social inclusivity²²'*;
- Environmental compliance and enforcement – in both the City's own operations and of business and external stakeholders – including defining the applicable legislation and enforcing the applicable regulations and legislation; and
- Environmental education, awareness, and communication, with a focus on voluntary behaviour change.

5. Transit Oriented Design (TOD) Strategic Framework

This Framework was adopted by Council in March 2016 and requires that it be used as the basis for promoting TOD in the City. This means that the principles, objectives and vision of TOD should be used as a primary informant for the review of City strategic and built environment plans. In addition, this Framework guides the implementation and alignment of public and private investment, as well as TOD programmes, projects, initiatives and a toolkit. It aims to address the city's urban inefficiencies through the development of a "Comprehensive TOD" scenario, using the IPTN Plan as a guideline for the alignment of all city plans and projects for development along identified corridors. It recognises the relationship between transport and land use in determining travel patterns, as shown in the table below.

TRANSPORT	LAND USE
1. Reduce Travel Distances: to reduce the cost of commuter travel and improve operational viability of public transport.	1. Intensify and diversify urban development in close proximity to public transport stations.
2. Optimise bi-directional flows	2. Promote an appropriate mix and form of residential, social and economic activity between urban nodes along higher-order public transport corridors.

²¹ Investment in, value-add to and jobs created through.

²² Social inclusivity at the most basic level is simply ensuring that all citizens are included in all aspects of social, economic, and political life. This includes the provision of basic services, education, and economic opportunities.

3. Generate a greater level of seat renewal
(balancing trip attractions and productions)

3. Promote an appropriate mix and form of residential, social and economic activity between district and local nodes along higher-order public transport corridors.

Annexure D: The regulatory context: National legislation that provides a guiding framework for the Climate Change Policy

1. The Constitution of the Republic of South Africa, 1996

The Constitution enshrines the right of South Africans to a well-managed, clean, and healthy environment and also gives local government a mandate to govern (transparently) and provide services (in a sustainable manner). This is evident in sections 24²³ and 152²⁴ of the Constitution.

According to Schedules 4B and 5B of the Constitution, local government is mandated to manage and legislate on the following issues that may relate to the effects of climate change

- *Air pollution*
- *Building regulations*
- *Electricity and gas reticulation*
- *Municipal planning*
- *Municipal health services*
- *Municipal public transport*
- *Stormwater management systems in built-up areas*
- *Water and sanitation services limited to potable water supply and domestic wastewater and sewage disposal systems*
- *Municipal parks and recreation*
- *Municipal roads*
- *Refuse removal, refuse dumps and solid waste disposal*

2. National Climate Change Response Policy (2011)

The National Climate Change Response Policy (NCCRP) presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. South Africa's response to climate change has two objectives namely: effectively managing inevitable climate change impacts through interventions that build and sustain South Africa's social, economic, and environmental resilience and emergency response capacity; and making a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

²³Section 24: *Everyone has a right*

1. *to an environment that is not harmful to their health or well-being; and*
2. *to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:*
 - a. *prevent pollution and ecological degradation;*
 - b. *promote conservation; and*
 - c. *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

²⁴Section 152 states:

1. *The objects of local government are*
 - a. *to provide democratic and accountable government for local communities;*
 - b. *to ensure the provision of services to communities in a sustainable manner;*
 - c. *to promote social and economic development;*
 - d. *to promote a safe and healthy environment; and*
 - e. *to encourage the involvement of communities and community organisations in the matters of local government.*
2. *A municipality must strive, within its financial and administrative capacity, to achieve the objects set out in subsection (1).*

In response to climate change challenges in the context of coastal settlements, the NCCRP states that South Africa will ensure that national, provincial, and municipal coastal management plans incorporate relevant climate information and geographic information systems and adopt a risk-based approach to planning that anticipates the consequences of the continued migration of communities into high risk coastal areas.

Mitigation is regarded as a national priority and in this regard, South Africa commits to actively engaging in international negotiations under the UNFCCC. South Africa is committed to preparing an annual GHG Emissions Inventory, and reporting on the Intended Nationally Determined Contributions (INDCs) as agreed to in the Paris Agreement, which will allow for the analyses, tracking and reporting of climate action in the country.

National government undertakes a multi-pronged approach to addressing and managing response measures, especially in respect of those that may have negative economic impacts. At the international level, South Africa engages actively in the multilateral climate change negotiations, to ensure a fair and effective outcome that is in accordance with the principles of equity, common but differentiated responsibility, and respective capabilities, and that provides developing countries with sufficient time and development space for the required economic transition to lower-carbon economies. At the national level, the challenge will be to effectively manage and reduce the economic risks, to build on and optimise the potential opportunities, and to ensure a smooth and just transition to a climate-resilient, equitable, and internationally competitive lower-carbon economy and society.

While the NCCRP provides an overarching guide for addressing climate change, its alignment with other national policies and legislation is still being assessed and the development of a Climate Change Act is still under discussion.

3. National Environmental Management Act, 1998 (Act No. 107 of 1998)

The National Environmental Management Act sets out a core set of principles, which apply to the actions of all organs of state that may significantly affect the environment. These principles include a commitment to socially, environmentally, and economically sustainable development and speak to multiple aspects of climate change. In particular, the following principles in Section 2 are relevant to this policy:

(3) *Development must be socially, environmentally and economically sustainable.*

(4) (a) *Sustainable development requires the consideration of all relevant factors including the following:*

(i) *That the disturbance of ecosystems and loss of biological diversity are avoided.*

(ii) *That pollution and degradation of the environment are avoided.*

(vii) *That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.*

(viii) *that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented are minimised and remedied.*

- (c) *Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.*
- (e) *Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.*
- (r) *Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.*

4. National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977)

The National Building Regulations and Building Standards Act regulates building regulations and building standards in South Africa.

This Act together with the regulations of this Act makes provision for the following:

- Requirements for a building to have precautionary and safety measures in place in case of a fire or any other emergency.
- Ensuring that the building is resistant against floods, heat, moisture, vermin and other pests and ensuring that the building will not have an adverse effect on the health of occupants and neighbours.
- In 2011 further sections were added to the act (SANS 10400 X and XA) to legislate for environmental sustainability and energy usage in buildings respectively.

In terms of this Act, municipalities are responsible for approving plans and specifications for the erection of all buildings. As part of this process municipalities must ensure that the National Building Regulations are met and by ensuring compliance with SANS 10400-XA: 2011 (which promotes efficient energy use in buildings), the City can ensure a low carbon and resource efficient development path for Cape Town.

5. National Water Act, 1998 (Act No. 36 of 1998) and Water Services Act, 1997 (Act No. 108 of 1997)

The Water Services Act requires municipalities to develop a water services development plan in which details of water conservation, water recycling, and environmental protection measures are included.

Some of the key objects of this Act that have implications for this policy are:

- To ensure the right of access to basic water for sanitation and other basic needs and to prioritise water effectively in case of a shortage.
- To manage the demand for water through the use of tariffs and to develop by-laws for determining tariffs.
- To adopt and prepare water services development plans to evaluate water supply and to determine possible water demand and water supply alternatives.

The National Water Act requires the establishment of water catchment agencies that operate on the local level in partnership with the local authority and/or the community and that should support the effective catchment supply of water and water quality. The Act further requires that water management institutions inform the public on droughts, floods, dam failures, and other water related issues/disturbances. Furthermore it is also required that the 1:100 year floodlines are determined for and included in township layout plans.

6. Disaster Management Act, 2002 (Act No. 57 of 2002) ; and Disaster Management Amendment Act 2015 (Act No. 16 of 2015)

The Disaster Management Act requires municipalities to establish disaster management centres and implement a framework for disaster management that ensures an integrated approach by government entities, non-governmental organisations, and the private sector. The directive to anticipate and prepare for future disaster risks is currently being strengthened with explicit references to climate change in the Disaster Management Amendment Act (2015). The Act stipulates that all spheres of government, including all municipalities and other municipal organs of state, must include expected climate change risks and impacts in the preparation of their disaster management plans by providing measures and indicating how they will invest in climate change adaptation, including ecosystem and community-based adaptation approaches.

7. National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

The Air Quality Act provides for a comprehensive decision-making and management framework for air pollution. The Act recognises that air pollution bears a high social, economic and environmental cost that is seldom carried by the polluter and that atmospheric emission of ozone-depleting substances, greenhouse gases and other substances have harmful effects on the environment.

As a result, some key objectives of this Act that relate to this Policy are:

(a) to protect the environment by providing reasonable measures for-

- the protection and enhancement of the quality of air in the Republic;
- the prevention of air pollution and ecological degradation; and
- securing ecologically sustainable development while promoting justifiable economic and social development

(b) generally to give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

The Act enables each municipality to include in its IDP an air quality management plan to improve air quality and give effect to air quality management best practices. Furthermore, the Act provides the basis for setting ambient air quality and emission standards and provides for the development of regulations on climate change matters. The Declaration of Greenhouse Gases as Priority Air Pollutants (Notice 172 of 2014) also forms part of the Air Quality Act (2014) implementation.

The draft National Greenhouse Gas Emission Reporting regulations provide for a single reporting system for tracking or reporting emissions. The regulations outline reporting requirements, penalties, activities for which GHG emissions must be reported, for instance. The reporting system is intended to inform a National GHG Inventory as well as policy formulation.

8. Municipal Systems Act, 2000 (Act No. 32 of 2000)

The Municipal Systems Act sets out legislation that enables municipalities to uplift their communities by ensuring access to essential services in a sustainable manner. The Act defines the legal nature of a municipality as including the community and clarifies the executive and legislative powers of local government.

Regarding climate change, the Act enables municipalities to enact by-laws to regulate matters such as stormwater management, coastal management, water demand management, environmental health and disaster risk management, in line with national and provincial legislation.

Entrenched in the Act is the critical need for integrated development planning which contributes to the progressive realisation of the fundamental rights contained in section 24 ... of the Constitution and promotes the right to an environment that is not harmful to people's health or well-being (Taylor et al., 2016).

It is also possible to include environmental and climate change related targets, indicators and objectives within municipal performance management systems as long as it aligns with the Act (Taylor et al., 2016).

9. Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)

The Spatial Planning and Land Use Management Act (SPLUMA) provides for inclusive, equitable and efficient spatial planning and land use management. SPLUMA sets out a number of climate change-related development principles: spatial justice, spatial sustainability and spatial resilience (Taylor et al., 2016). Guided by these principles, SPLUMA requires local government to prepare spatial development frameworks (SDFs) that provide direction for strategic developments, infrastructure investment while promoting efficient, sustainable and planned investments across all sectors and highlight priority areas for investment in land development.

Measures for climate change adaptation can be inserted in SDFs, zoning schemes and/ or policies developed in terms of planning laws, such as densification policies (Taylor et al., 2016). Furthermore, SPLUMA stipulates that all land-use decisions municipalities make must comply with measures designed to protect and promote sustainable use of land. This stipulation facilitates consideration of potential future impacts of climate change on the land and the potential risk to people and infrastructure created by approving development on parcels of land that are projected to be at high risk under future climate conditions.

10. National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The National Environmental Management: Biodiversity Act (NEMBA) provides the framework for conserving and sustainably managing biological resources. Ecosystem-based adaptation is presented as a key component of the National Biodiversity Framework and NEMBA. As such, NEMBA (section 48) states that municipal IDPS must align with and outline means to implement the National Biodiversity Framework.

Additionally, NEMBA lists a number of local government obligations that would strengthen the protection of biodiversity and ecosystems as well as their ability to adapt to climate change and deliver services that protect human settlements and economic activities (Taylor et al., 2016).

Obligations include the duty to align by-laws, biodiversity management plans and conservation plans with NEMBA and to consider threatened ecosystems and invasive species management in IDPs. *“This has particular relevance to climate change, as threatened ecosystems may be the most vulnerable to climate change and invasive species will tend to thrive and spread in warmer climate further negatively affecting biodiversity, absorbing further water resources and increasing fire risks”* (Taylor et al., 2016 p. 11-21).

11. National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)

The Protected Areas Act provides for the sustainable use of protected areas for the benefit of people, in a manner that preserves the ecological character of the area. In the context of climate change, protected areas can both protect biodiversity from the impacts of climate change and ensure sustained ecosystem goods and services within the context of a changing climate. Although the Act does not give local government the authority to declare protected areas, the Minister may delegate the power to municipalities to be a management authority of protected areas. This delegation of power could enable municipalities to protect the ecological functioning and biodiversity value of their natural areas from climate change impacts (Taylor et al., 2016). This may enable the *“preservation of natural open spaces ... that provide critical buffering capacity in times of climate extremes like heat spells and heavy rains”* (Taylor et al., 2016. p. 11-21).

12. National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)

The Integrated Coastal Management Act (ICMA) provides for the integrated management of the coastal zone by all three spheres of government and includes a number of mechanisms that, if used strategically, could support the collective management of the coast in order to reduce climate change impacts.

Mechanisms presented in the ICMA include delineation of coastal public property, coastal protection zones and coastal set-back lines and the establishment of special management areas and municipal coastal management programmes. These coastal planning mechanisms each play an essential role in enhancing the ability of coastal zones to adapt to climate change (Taylor et al., 2016).

To inform management of the coastal zone, all coastal municipalities must prepare municipal coastal management programmes (CMPs) which can be mainstreamed into core municipal functions by adopting them as part of an IDP or SDF (Taylor et al., 2016). As a result, ensuring the inclusion of climate change considerations in CMPs will contribute to the integration of climate change objectives in the IDP and SDF.

13. National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008)

The Waste Management Act was circulated with the overall purpose of protecting the health of people and the environment by preventing pollution and ecological degradation. The Act does this by placing minimum requirements for any person who undertakes an activity which produces waste or a person who handles any waste which has already been produced to comply with. The Act also proposes waste management options such as reduction, reuse, recycling and recovery of waste other than disposal, for which each municipality must compile an integrated waste

management plan. The effective management of waste should reduce GHG emissions in all stages of the value chains of goods and services.

14. Customs and Excise Act (no 91 of 1964): Carbon Dioxide Emission Levy

This legislation incentivises the production of "clean energy" vehicles, as it taxes local car manufacturers producing certain vehicles for the local market, through a "duty at source" tax.

15. The National Energy Act (Act 34 of 2008)

The Act includes the objectives of promoting the security of energy supply in South Africa and the management of energy demand and conservation and includes a focus on expanding renewable energy. It provides for the development of the Integrated Energy Plan (IEP).

16. White Paper on the Energy Policy of the Republic of South Africa 1998

This White Paper, which has not been updated, sets out the government's official policy on the supply and consumption of energy. One of its main goals is to strengthen energy security by diversifying energy supply, alongside other goals such as improving energy governance and managing environmental effects. It provides for investment of national resources in renewable energy technologies.

17. White Paper on the Renewable Energy Policy of the Republic of South Africa 2004

This pledges government support for the development, demonstration and implementation of renewable energy sources, setting a target of 10 000 GWh/annum renewable energy contribution to final energy consumption by 2013. This White Paper envisions an energy economy where renewables contribute to affordable access to energy, thus contributing to sustainable development and environmental conservation.

18. Electricity Regulation Act 4 of 2006 (amended 2008)

This act establishes the national regulatory framework for electricity and is primarily concerned with the licensing of electricity production and distribution activities. It institutes the National Energy Regulator of South Africa (NERSA) as the enforcer of this framework. One of its objects is to promote the use of diverse energy sources and energy efficiency.

19. Taxation Laws amendment Act no. 25 of 2015, Amendment of section 12B of Act 58 of 1962

This introduced a tax break for investments in renewable energy, incentivising small-scale embedded generation such as rooftop solar photovoltaic systems. It provides an accelerated depreciation allowance on renewable energy to 100% in one year.

20. Taxation Laws amendment Act no. 25 of 2015, Amendment of section 12L of Act 58 of 1962

This introduced a higher level of tax break for investments in energy efficiency projects. The deduction claim for substantiated energy efficiency savings was raised to 95 cents per kilowatt hour.

Annexure E: City of Cape Town by-laws, strategies and policies that are relevant to the Climate Change Policy

By-laws	Year	Relevance to the Climate Change Policy
City of Cape Town Air Quality Management By-law	2010	The Air Quality Management By-law highlights the need to ensure that air pollution levels (and CO ₂ emissions) are controlled and reduced as far as reasonably possible.
City of Cape Town Municipal Planning By-law	2015	The criteria for decision making such as considering the effects of land and development on other developments and provincial/national legislation (section 99 (2)) which may include the effect on the surrounding community, economic impact, and environmental health and safety (section 30 (f- h)) have relevance to this policy.
City of Cape Town Integrated Waste Management By-law and Integrated Waste Management Amendment By-law	2009 2015	The Integrated Waste Management By-law (and its amendment) promotes the environmentally sustainable management of waste in the City of Cape Town thus mitigating the adverse effects that waste can have on climate change and environmental health.
City of Cape Town By-law relating to Stormwater Management	2005	The Stormwater Management By-law aims to protect the stormwater system, prevent flooding risk, and mandates council to provide the necessary stormwater infrastructure to ensure an effective and sustainable stormwater management system that can adapt to and is resilient in the face of climate change. The By-law is currently under review and is anticipated to incorporate new sustainability concepts such as water sensitive design and other progressive stormwater management approaches.
City of Cape Town Water By-law	2010	The Water By-law makes provision for water restrictions in times of shortages (section 36), the minimisation of wastage (section 37) and the conservation and demand management of water (section 38 and schedule 1) in order to prepare for possible climate related events such as drought.
Constitution of the Transport and Urban Development Authority of Cape Town Amendment (TDA) by-law	2017	This by-law amalgamates the responsibility for transport, land use, environmental and human settlement planning, operation, implementation and regulation under one Authority under the National Land Transport Act, to facilitate integrated planning.

Policies	Year	Relevance to the Climate Change Policy
Management of Urban Stormwater Impacts Policy	2009	The objectives of the Management of Urban Stormwater Impacts Policy are to support water sensitive urban design principles and to reduce urban stormwater quality and quantity impacts of urban systems and new developments on receiving waters,

		thereby reducing risks such as flooding and water quality degradation (which may be related to climate change phenomena).
City Parks Development Policy	2009	The Parks Development Policy recognises that public open spaces such as parks can have a positive impact on the environment through the mitigation of air and water pollution. The desired outcomes include the contribution of parks to a sustainable environment that takes into account the use of green techniques and technologies that could support mitigation and adaptation.
Responsible Tourism Policy for the City of Cape Town	2009	The Responsible Tourism Policy recognises the possibility of a competitive advantage in the sale of goods and services that have been procured or manufactured in a sustainable manner with a reduced carbon and environmental footprint, thereby limiting the contribution to and effects of climate change. Further principles include the mitigation of future risks associated with climate change by reducing greenhouse emissions.
City of Cape Town Urban Design Policy	2013	Objective eight of the Urban Design Policy states that 'development should protect, value and enhance the natural environment through sustainable design', thus taking into account the ecological and environmental footprint and accounting for and adapting to the changes in the environment brought about by climate change and other natural factors.
Cape Town Densification Policy	2012	The Densification Policy aims to improve Cape Town's sustainability and to enhance the quality of the built environment. It is believed that densification will lower resource use and travel time thereby minimising the ecological, environmental and carbon footprint of the built environment.
Floodplain and River Corridor Management Policy	2009	The Floodplain and River Corridor Management Policy aims to maintain and protect the integrity of natural water courses and bodies and to prevent flooding by providing guidance and control of a variety of activities and development types during the City's development application processes.
City of Cape Town Integrated Coastal Management Policy	2014	The Integrated Coastal Management Policy aims to, among others, promote a 'no regrets' principle with regards to climate change adaptation.
Integrated Waste Management Policy	2006	To give guidance on the implementation of the waste hierarchy with specific focus on waste minimisation. The reduction in the amount of waste disposed at landfill sites will subsequently result in the reduction of GHG emitted, particularly Methane from landfill sites.

Strategies and plans	Year	Relevance to the Climate Change Policy
Air Quality Management Plan for the City of Cape Town	2005	The Air Quality Management Plan (aligned with the Western Cape Air Quality Management Plan) focuses on the need to reduce and minimise air pollution (and CO ₂ emissions) and improve the health of the city's citizens.
Cape Town Spatial Development Framework	2012	The Spatial Development Framework places an emphasis on maintaining the resilience and adaptive capacity of the city.
City of Cape Town Coastal Management Programme	2015	The purpose of the Coastal Management Programme is to manage the coastal zone of Cape Town in order to optimise the socio-economic and environmental potential of Cape Town's coastline including in the face of climate change.
Comprehensive Integrated Transport Plan (2013-2018)	2014	<p>The draft Comprehensive Integrated Transport Plan review (2017) vision is "Bringing about the social, economic and spatial transformation of Cape Town, as well as reversing the effects of apartheid on the built environment, by:</p> <ul style="list-style-type: none"> • ensuring excellence in service delivery • implementing dense and transit oriented urban growth and development • building integrated communities" <p>The CITP is an umbrella or "apex" document which provides direction to all TDA policies, strategies, and guidelines, such as the Integrated Public Transport Network (IPTN: 2014), The Transit Oriented Development (TOD) Strategic Framework (2016), the Draft Travel Demand Management (TDM) Policy (2016), the Non-motorised Transport (NMT) Strategy and the draft Cycling Strategy (2016), etc. While its vision is not explicit about the environment, it supports environmental protection through limiting emissions (a mitigation strategy), and through promoting land use intensification within the existing city footprint (an adaptation strategy).</p>
Integrated Waste Management Plan	2013	To give effect to the strategies for waste minimisation and the sustainable provision of waste services to minimise social, health, environmental and economic impacts.
Public Environmental Awareness, Education and Training Strategy	2011	<p>The principles of this strategy includes:</p> <ul style="list-style-type: none"> • The production of learning and outcomes which include environmental consciousness and awareness, and the commitment and capacity to act on environmental issues such as climate change • Recognise the complexity of environmental issues, such as climate change, and the need to find solutions collectively

		<ul style="list-style-type: none"> • Empower all people to participate effectively in democratic change towards a better environment for all.
Water Conservation & Water Demand Management Programme / Strategy	2007 with updates 2014/15	Objective A1 to reduce and maintain low levels of water losses through the reticulation system; Objective E2 to promote alternative water resources and technologies; and Objective E3 to conserve water resources are all relevant to climate change.
Local Biodiversity Strategy and Action Plan (LBSAP) 2009-2019	2009 (being updated)	The LBSAP aims to 'ensure sustainability of our rich biodiversity', which would include in the face of climate change.
City of Cape Town Bioregional Plan	2015	The Bioregional Plan Policy comprises a biodiversity profile, the Biodiversity Network and management guidelines. The terrestrial and aquatic features critical to conserve and manage for maintaining ecological functioning and conserving biodiversity are identified. Doing so will improve resilience of remaining natural areas and buffer Cape Town from the impacts of climate change.

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