A legal perspective on the development of a South African local government climate change mitigation waste management framework

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ABSTRACT

Climate change is a global phenomenon caused by human systems having negative impacts on nature, threatening continued human existence on earth. These impacts are caused by increased greenhouse gas (GHG) emissions into the atmosphere, to dangerous levels. Although the waste sector is not the biggest contributor to GHG emissions, it could significantly contribute to the reduction in GHG concentrations in the atmosphere, especially relating to carbon dioxide and methane concentrations.

The international community has under the *United Nations Framework Convention on Climate Change*, 1992, the *Kyoto Protocol*, 1996 and the *Paris Agreement*, 2015 established mitigation mandates to reduce GHG emissions. States need to set targets and commitments to contribute to GHG reductions (nationally determined contributions), to keep the "increase in the global average temperature to well below 2^{o}C above pre-industrial levels and to limit the temperature increase to 1,5^{o}C above pre-industrial levels".

Section 24 of the Constitution of the Republic of South Africa, 1996 provides that the state must protect the environment and secure sustainable development by implementing reasonable legislative and policy measures. The South African environmental legislative landscape on national, provincial and municipal level is therefore analysed to establish compliance with the climate change mitigation mandate, with specific reference to the waste management sector. The eThekwini Metropolitan Municipality is the object of a case study to verify the implementation of the environmental legal framework in practice.

The questions asked in this dissertation are addressed by way of a desktop theoretical analysis of what should be included in a comprehensive legal and policy framework that could be used as a tool to regulate, monitor and evaluate the compliance of South African local government with legislation in implementing climate change mitigation factors for the function of waste management. The legal

framework will be structured in a compliance tool for climate change mitigation implementation in the local government waste management sector.

Key words

Climate change; mitigation; waste management; legal regulatory framework; municipal monitoring and evaluation; South Africa: eThekwini Metropolitan Municipality

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LIST OF ABBREVIATIONS

CAP	Climate Action Plan
CBDR-RC	Common but Differentiated Responsibilities and Respective Capabilities
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CH_4	Methane
CO_2	Carbon Dioxide
COP	Conference of the Parties
DAC	Durban Adaption Charter
DCAP	Durban Climate Action Plan
DCCS	Durban Climate Change Strategy
DEFF	Department of Environment Forestry and Fisheries
DRAP	Durban Research Action Partnership
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EIP	Environmental Implementation Plan
EMM	eThekwini Metropolitan Municipality
EMP	Environmental Management Plan
EPWP	Expanded Public Works Programme
ERUs	Emission Reduction Units
GHG	Greenhouse Gas
GHGEI	Greenhouse Gas Emissions Inventory
ICLEI	International Council for Local Environmental Initiatives
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IPCC	Intergovernmental Panel on Climate Change
ISWA	International Solid Waste Association
IWMP	Integrated Waste Management Plan
JI	Joint Implementation
KPIs	Key Performance Indicators
KZN	KwaZulu-Natal Province
LEG	Local Environmental Governance
LFG	Landfill Gas

LGCR	Local Government Climate Roadmap
MCPP	Municipal Climate Protection Programme
MDB	Municipal Demarcation Board
MEC	Member of the Executive Council
MFMA	Local Government: Municipal Finance Management Act
MPAC	Municipal Public Accounts Committee
MRV	Monitoring, Reporting and Verification
Mt	Million Tonnes
$MtCO_2e$	Million Tonnes of Carbon Dioxide Equivalent
NDC	Nationally Determined Contribution
NDP	National Development Plan
NDWCS	National Domestic Waste Collection Standards
NEM:WA	National Environmental Management: Waste Act
NEMA	National Environmental Management Act
NWIR	National Waste Information Regulations
NWMS	National Waste Management Strategy
PEJL	Potchefstroom Electronic Law Journal
PMS	Performance Management System
SAJHR	South African Journal on Human Rights
SDBIP	Service Delivery and Budget Implementation Plan
SDF	Spatial Development Framework
SDG	Sustainable Development Goal
SDM	Sustainable Development Mechanism
tCO_2e	Tonnes of Carbon Dioxide Equivalent
UKZN	University of KwaZulu Natal
UN	United Nations
UNDC	Updated Nationally Determined Contribution
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WC&MR	Waste Classification and Management Regulations
WEF	World Economic Forum
WMO	World Meteorological Organisation

Chapter 1: Introduction

1.1 Aim of the study

The aim of this study is to determine the composition of a comprehensive legal and policy framework for South African local government to regulate, monitor and evaluate compliance with legislation in responding to climate change mitigation for the waste management function.

1.2 Climate Change and its impact on the environment

Climate change (also known in colloquial language as "global warming") is the phenomenon of the increase of the annual mean surface temperature of the earth's atmosphere as a result of the increase of greenhouse gasses (GHGs) in the earth's atmosphere.[1] The *Kyoto Protocol* identifies Methane (CH_4), Carbon dioxide (CO_2), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride (SF_6) as GHGs.[2] The *United Nations Framework Convention on Climate Change* (hereinafter the UNFCCC)[3] defines "climate change" as:

> … 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.

According to the Intergovernmental Panel on Climate Change (hereinafter the IPCC)[4] anthropogenic GHG emissions have increased to the highest level ever and

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1 Bulkeley and Betsill *Cities and Climate Change* 1.

2 Annex A to the *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (1997) (hereinafter referred to as the *Kyoto Protocol* (1997)).

3 Article 1(2) of the UNFCCC (1992).

4 The IPCC is in terms of the IPCC *4th Assessment Report* an intergovernmental body of the United Nations (UN) set up to provide detailed socio-economic, scientific and technical information relating to climate change. IPCC 2007 *4th Assessment Report* vii. The IPCC is an organisation of governments that are members of the UN or the World Meteorological Organisation (WMO). IPCC reports form the basis for climate change negotiations and climate change policies. For IPCC Assessment Reports, scientists volunteer their time to evaluate scientific papers published each year to provide input on the causes of climate change, its impacts and risks assesments. Inputs are also made on adaptation and mitigation efforts that may reduce the risk of climate change. The IPCC has three working groups, i.e. Working Group I, focussing on the Physical Science Basis of Climate Change, Working Group II, focussing on

the increased CO_2 and N_2O levels are most likely to have a dominant cause for global warming and climate change.[5] Since 2011[6] GHG concentration levels have continued to increase to their highest levels ever,[7] with CO_2 concentrations being the highest in 2 million years and concentrations of CH_4 being higher than in the last 800 000 years.[8] The global surface temperature[9] in 2001 to 2020 was 0.99°C higher than in 1850-1900,[10] with a higher increase over land (1.59°C) than over the ocean (0.88°C).[11]

Climate stability is based on the principle that there must be a balance between the sun's radiation energy warming the earth's surface and the thermal radiation of the earth and the atmosphere radiating out to space. If this balance is disturbed by the increase of GHGs like CO_2, the balance is corrected by an increase in the earth's surface temperature.[12] GHGs absorb long-wave radiation and disrupt the earth's energy balance, leading to climate change.[13]

GHGs act as a blanket around the earth. A blanket keeps your body warm not because the blanket gives off heat or energy, but because it traps your body heat and prevents it from escaping to colder areas. CO_2 traps the long-wave radiation given off by the earth.[14] An increase in GHGs will therefore have the effect of increasing the earth's temperature.

Climate Change Impacts, Adaptation and Vulnerability, and Working Group III, focussing on the Mitigation of Climate Change. Refer to the IPCC website at https://www.ipcc.ch/about/.

5 IPCC 2014 *5th Assessment Report* 5.

6 Measurements reported in the 2014 *5th Assessment Report*.

7 IPCC 2021 *6th Assessment Report* 5.

8 IPCC 2021 *6th Assessment Report* 9.

9 In terms of the *6th Assessment Report* "global surface temperature" refers to both global mean surface temperature and global surface air temperature. Refer to the 2021 *6th Assessment Report* 5.

10 In terms of the *6th Assessment Report* the period of 1850-1900 is viewed as the period representing pre-industrial conditions and is the earliest period with complete available data to estimate global surface temperature. Refer to the 2021 *6th Assessment Report* 5.

11 IPCC 2021 *6th Assessment Report* 5.

12 Houghton *Global Warming* 14.

13 Bulkeley and Betsill *Cities and Climate Change* 1.

14 Ramanathan and Feng 2009 *Atmospheric Environment* 38.

Figure 1 illustrates the greenhouse effect with sunlight that is reflected and GHG trapping the heat to keep the earth warm.

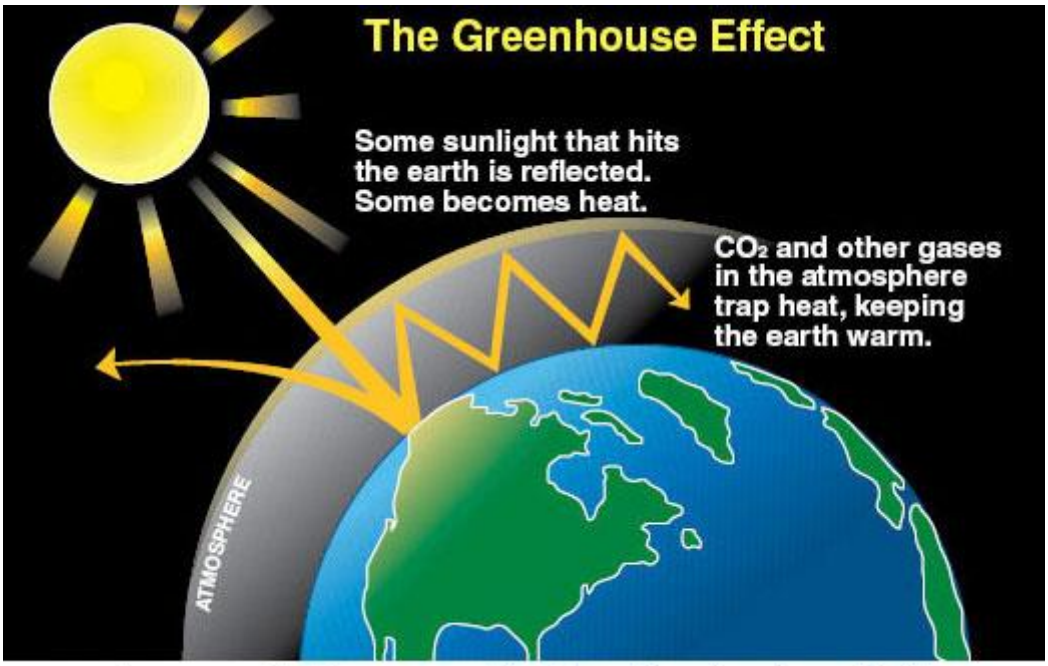

Image source: http://www.ecy.wa.gov/climatechange/images/greenhouse_effect2.jpg

Figure 1: The greenhouse effect[15]

According to the IPCC there is no doubt that climate system is warming and the atmosphere and the ocean have warmed.[16] The IPCC further states that there is no doubt that the atmosphere, ocean and land have warmed due to human influence and that widespread changes in the atmosphere, ocean, cryosphere and biosphere have occurred in a short time.[17] Changes in climate have caused negative impacts on natural and human systems, such as extreme weather and climate events such as cold and warm temperature extremes, extreme high sea levels and increased rainfall.[18] The IPCC predicts that:

> Continued emission of greenhouse gases will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood

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15 TutorBin 2019 https://medium.com/@tutorbin/greenhouse-effect-advantages-and-disadvantages-4d4f113ec61d.
16 IPCC 2014 *5th Assessment Report* 2.
17 IPCC 2021 *6th Assessment Report* 5.
18 IPCC 2014 *5th Assessment Report* 6-7.

> of severe, pervasive and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in greenhouse gas emissions which, together with adaptation, can limit climate change.[19]

This prediction was confirmed by the IPCC in its *6th Assessment Report* that climate change due to human influence is already responsible for weather and climate extremes in every region across the world and that extreme and unprecedented heatwaves, heavy precipitation, droughts and tropical cyclones are observed.[20] GHG emissions are primarily caused by human activities[21] such as population size, , lifestyle, land-use patterns, economic activity, energy use, technology and climate policy.[22] Climate change might be a vicious circle in that many changes in the climate system are directly equivalent to increases in global warming and they will increase in frequency and intensity, such as inducing more frequent and intense hot extremes, marine heat waves, heavy precipitation and droughts.[23]

In 2018 in its 13th edition of the Global Risk Report[24] the World Economic Forum (WEF) identified "extreme weather events and temperatures, accelerated biodiversity loss, the pollution of air, soil and water and the failure to respond to climate change mitigation and adaptation as the top risks to the globe in terms of both impact and likelihood". In the WEF's 2019 Global Risk Perception Survey,[25] environmental risks again featured under the top five risks with regard to both impact and likelihood. The Survey indicated that respondents are increasingly concerned about the failure to implement environmental policy and climate change mitigation and adaptation measures. Rumsey and King [26] contend that certain climate change impacts are unavoidable due to the current anthropogenic emissions

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19 IPCC 2014 *5th Assessment Report* 8.

20 IPCC 2021 *6th Assessment Report* 10.

21 Although certain natural forces such as volcanos and solar flaring also contribute to climate change, this study focusses on the human influence on climate change. For a discussion on the natural influences on climate change, refer to Crowley *Science* 270-277.

22 IPCC 2014 *5th Assessment Report* 8.

23 IPCC 2021 *6th Assessment Report* 19.

24 World Economic Forum 2018 https://www.weforum.org/reports/the-global-risk-report-2018.

25 World Economic Forum 2019 https://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf.

26 Rumsey and King "Climate Change: Impacts, Adaptationand Mitigation; Threats and Opportunities" 1050.

and that even if GHG levels were stabilised at this point in time, global warming would inevitably continue until the end of the century. The IPCC also contends that global surface temperatures will continue to rise until at least the middle of the century despite any mitigation efforts made and that global warming of 1.5°C and 2°C will be exceeded during the 21st century unless CO_2 and other GHG emissions could drastically be reduced in the coming decades.[27] The impact of the past and predicted future GHG emissions will be irreversible for centuries to come, especially the negative impact on the ocean. The global sea level will continue to rise due to melting glaciers and ice sheets. The loss of permafrost carbon as a result of permafrost thaw will also be irreversible.[28]

With reference to the impact of climate change on South Africa, if the increase in the average global temperature is not kept below 2°C it is predicted to cause higher temperatures at the coast of about 1 to 2°C and in the interior of around 2 to 3°C. Certain areas of the country will become drier and the increase in evaporation will result in an overall decline in the availability of water. The incidence of veld and forest fires will increase, and extreme weather conditions such as floods and droughts will impact on human life. Water-intensive economic sectors like agriculture and mining will also be negatively impacted.[29] The following critical sectors would be impacted by climate change:

- Biodiversity; the grassland biome will be taken over by woody vegetation due to a rise in temperature and an increase in CO_2;[30]

- Agriculture: Drier conditions will increase the demand for irrigation and the yield of crops will be influenced as the pattern of rainfall may change in both summer and winter rainfall regions;[31]

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27 IPCC 2021 *6th Assessment Report* 17.
28 IPCC 2021 *6th Assessment Report* 28.
29 *National Climate Change Response White Paper*, 2011 9.
30 Ziervogel *et al* 2014 *WIREs Climate Change* 608-609.
31 Ziervogel *et al* 2014 *WIREs Climate Change* 609.

- Water: The incidence of flooding and droughts will increase. The availability of water relates directly to health and economic factors.[32]

- Cities and the built environment: The rise in sea levels will influence cities and increased the pressure on water supply systems.[33]

- Health: Climate change may have the following impacts on health, i.e. increased stress, diarrhoea, respiratory and cardio-vascular disease. and an increase in vector-borne infectious diseases such as malaria.[34]

In the context of these possible negative impacts of climate change, the South African Government has made the following commitments in the *National Climate Change Response White Paper*:[35]

- It accepts the conclusion of the IPCC that there is no doubt that the climate system is warming and that the increase in GHG concentrations is primarily due to human activity;

- Climate change is recognised as one of the biggest threats to sustainable development; and

- It will participate with the global community in ensuring the implementation of international climate change instruments.

1.3 Climate change mitigation

The UNFCCC had the development of climate change mitigation strategies as its principle objective, the primary strategy being to reduce the amount of GHGs in the atmosphere and thereby reduce its impact on climate change. Mitigating climate change can be achieved either by reducing GHG emissions into the atmosphere at

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32 Ziervogel *et al* 2014 *WIREs Climate Change* 609.
33 Ziervogel *et al* 2014 *WIREs Climate Change* 609-610.
34 Ziervogel *et al* 2014 *WIREs Climate Change* 610.
35 *National Climate Change Response White Paper*, 2011 9 (hereinafter referred to as the *White Paper*, 2011).

source[36] or by promoting sinks and reservoirs[37] that remove GHGs from the atmosphere.[38]

In its *4th Assessment Report* the IPCC defined mitigation as:

> An anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhancing greenhouse gas sinks.[39]

The *Paris Agreement* places strong emphases on mitigation to limit the increase of global temperature, the increased ability of countries to adapt to the negative impacts of climate change and promoting climate resilience, and development with GHG emissions.[40] The aforesaid measures should be implemented in a manner that eradicates poverty and does not negatively influence food production.[41]

Mitigation is therefore the strategy followed to prevent GHGs from being released into the atmosphere or to enhance the sinks that remove GHGs from the atmosphere.[42] Furthermore, mitigation is a tool for reducing and managing the risk of climate change. Considerable reductions of GHG in the atmosphere in the next few decades might reduce the risks in the 21st century and beyond, and ensure lower mitigation costs in future, as well as climate-resilience for sustainable development.[43] The IPCC contends in its *6th Assessment Report* that limiting global warming due to human influence to a specific level will require limiting cumulative

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36 Article 1 of the UNFCCC defines a "source" as "any process or activity which releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

37 Article 1 of the UNFCCC defines a "reservoir" as "a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored". Article 1 of the UNFCCC defines a "sink" as "any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere".

38 Blobel *et al* (eds) *UNFCCC Handbook* 74.

39 IPCC 2007 *4th Assessment Report* 878. The land and ocean have acted as sinks and taken up about 56% per year of CO_2 emissions from human activities in the last six decades, but the IPCC projects that with increased CO_2 emissions, the ocean and land sinks will become less effective at decreasing CO_2 levels in the atmosphere. Refer to the IPCC 2021 *6th Assessment Report* 5, 25.

40 Article 4 of the *Paris Agreement* (2015)

41 Article 2 of the *Paris Agreement* (2015).

42 King and Rumsey "Climate Change" 1052.

43 IPCC 2014 *5th Assessment Report* 17.

CO_2 emissions, with an end goal of at least zero CO_2 emissions,[44] as well as significant reductions in other GHG emissions. Significant reductions in CH_4 emissions would also contribute to the limiting of global warming and would improve air quality.[45]

Energy-related emissions are the main contributors to the increase in GHG emissions and therefore conventional climate change mitigation efforts are focussed on the supply and demand components of energy. Conventional mitigation strategies use decarbonisation methods to reduce CO_2 emissions and include renewable energy, efficiency gains, fuel switching, nuclear power and carbon capture storage and use.[46] Fawzy *et al*[47] contend that decarbonisation can be reached by utilising renewable energy and low carbon fuels like natural gas. Further mitigation efforts could be achieved by lowering the demand for energy by employing more energy-efficient processes.

The waste sector also contributes to GHG emissions[48] and the biggest climate change mitigation impact the waste sector could have would be through improving the waste material management, resulting in waste prevention, followed by the recycling of waste materials.[49] The saving of GHG emissions could be reached by incinerating waste and the recovery of the energy produced. Landfill gas (LFG) capture can reduce the emission of CH_4 and when the captured LFG is used to generate energy, this will lead to GHG savings.[50]

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44 "The term carbon budget refers to the maximum amount of cumulative net global anthropogenic CO_2 emissions resulting in limiting global warming to a given level with a given probability, taking other climate change forces into account. This is referred to as the total carbon budget when expressed starting from the pre-industrial period and as the remaining carbon budget when expressed from a recent specific date. The remaining carbon budget indicates how much CO_2 could still be emitted while keeping warming below a specific temperature level." Refer to the IPCC 2021 *6th Assessment Report* 36.

45 IPCC 2021 *6th Assessment Report* 36.

46 Fawzy *et al* 2020 *Environmental Chemistry Letters* 2074.

47 Fawzy *et al* 2020 *Environmental Chemistry Letters* 2073.

48 Refer to para 1.4 for data on the contribution of the waste sector to GHG emissions.

49 UNEP *Waste and Climate Change: Global Trends and Strategy Framework* 36.

50 UNEP *Waste and Climate Change: Global Trends and Strategy Framework* 36.

South Africa's waste mitigation strategy is *inter alia* contained in the *National Waste Management Strategy*, which enunciates the principles set out in Table 1. The principles of the strategy are in line with the international climate change mitigation aims of reducing the amount of GHG in the atmosphere and to reduce the impact of GHGs on climate change. Furthermore, the strategy aligns its principles with the international aims of eradicating poverty and maintaining food production by fostering sustainable strategic partnerships to implement the strategic principles and promoting environmentally sound socio-economic growth and development planning.

Table 1: Waste Management Strategy Principles[51]

Principle	**Explanation**
Waste minimisation	This refers to avoiding the amount and toxicity of waste that is generated and, in the event that waste is generated, to reducing the amount and toxicity of the waste that is disposed.
Waste prevention	This refers to avoiding the generation of waste and avoiding toxicity in waste.
Waste as a resource	This refers to beneficiating waste through re-use, recycling, treatment and recovery to reduce the amount and the toxicity of waste disposed of.
Sustainable strategic partnerships	This refers to government's establishing and sustaining collaborative working relationships with non-governmental role-players involved in the management of waste, i.e. the private sector, academia, civil society organisations and other development-funding institutions.
Environmentally sound socio-economic growth and development	This refers to ensuring that the intentions and commitments of the SDGs and NDP are continuously integrated and aligned to all environmental protection considerations, and that environmental protection programmes contribute to improving the socio-economic lives of people.

51 *National Waste Management Strategy*, 2020 22-23.

The three strategic pillars of waste minimisation, effective and sustainable waste services, and compliance, enforcement and awareness forms the basis of the NWMS.[52]

1.4 Waste management and climate change

Although the burning of fossil fuels is responsible for most of the GHG emissions, other environmental sectors like waste management also contribute to GHG emissions. As such, the emission of methane from landfills and the implementation of waste management policies have an impact on energy usage.[53] Waste is a major contributor to the greenhouse problem and Ackerman[54] expresses the opinion that it is easier to persuade most people to change their thinking about how to handle waste than to persuade them to drive more energy-efficient vehicles. This dissertation will focus on general waste.[55]

According to the International Solid Waste Association (ISWA), around 70% of the municipal waste produced worldwide is deposited at landfill sites, 11% is utilised as Waste-to-Energy, and the remaining 19% is recycled to be treated mechanically and biologically, including composting.[56] The ISWA also estimates that more than half of the global population does not have access to the most basic waste management services such as solid waste collection and removal from residential areas.[57] Methane is one of the GHGs emitted by waste decaying in refuse dumps and solid waste disposal sites. Methane gas is the second most important GHG as it has a global warming potential 20 times higher than that of carbon dioxide.[58] It is estimated that the waste sector contributes <5% of the global GHG emitted into the atmosphere, thereby contributing to climate change.[59] In 2016 it was estimated

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52 *National Waste Management Strategy*, 2020 32.
53 Ackerman 2000 *IJJS* 223.
54 Ackerman 2000 *IJJS* 223.
55 Refer to paragraph 3.3.5.
56 ISWA 2021 *Globilization and Waste Management* 5.
57 ISWA 2021 *Globilization and Waste Management* 5.
58 IPCC 2007 *4th Assessment Report: Waste management in Climate Change*.
59 Jigar, Bairu and Gesessew 2014 *Journal of Environmental Science and Water Resources* 52-58.

that the waste sector generated 1.6 billion tCO_2e GHG emissions, which equated to approximately 5% of global emissions. Expectations are that emissions will reach 2.6 billion tCO_2e by 2050 if no improvement is made in the waste sector.[60]

In terms of the 2018 State of Waste Report, South Africa generated 55 million tonnes of general waste in 2017, of which only 11% of that waste was diverted from landfill sites, and it is expected that the generation of waste will increase in future.[61] Furthermore, South Africa has constraints relating to the availability of land for landfill sites and also experiencing challenges with the decommissioning of current landfill sites.[62] Once waste is disposed of to landfill sites it is no longer economically productive, and without landfill gas capture methane is produced as a GHG. Taking the aforesaid factors into account, diverting waste from landfill as a mitigating factor is a primary goal of the NWMS.[63] According to the *GHG Inventory for South Africa* 2017, in 2000 the solid waste disposal sector contributed about 2% of South Africa's GHG emissions, and this was mainly due to emissions of methane from urban landfills. [64] The total accumulated GHG emissions from solid waste disposal increased by an estimated 56.7% between 2000 and 2017.[65]

Ackerman[66] contends that waste management has at least five types of impacts on GHG emissions and climate change.

i) Landfill methane emissions: Landfill methane accounts for 4% of all GHG emissions relating to global warming potential.[67]

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60 Wang and Stanisavljevic 2019 *Waste Management and Research* 1181.
61 *National Waste Management Strategy*, 2020 11.
62 *National Waste Management Strategy*, 2020 11.
63 *National Waste Management Strategy*, 2020 11.
64 DEA 2014 *GHG Inventory for South Africa 2000-2010* 238.
65 DFFE 2017 *National GHG Inventory Report 2017* 382.

66 Ackerman 2020 *IJJS* 223.
67 Ackerman 2020 *IJJS* 223-224. When biodegradable waste at landfills decomposes under anaerobic conditions, $C0_2$ and CH_4 are given off. The landfilling of biodegradable waste has been identified as one of the largest anthropogenic global CH_4 emission sources. Wang and Stanisavljevic 2019 *Waste Management and Research* 1181

ii) Reduced industrial energy use and emissions as a result of recycling and waste reduction: The IPCC estimates that to produce aluminium causes 40 times the GHG emissions per tonne more than to recycle aluminium material. For other materials emissions caused by primary production are 4 to 5 times higher per tonne than secondary emissions.[68]

ii) Energy recovery from waste: Controlling landfill gas has two benefits: landfill methane can be utilised instead of natural gas and the combustion process converts methane to CO_2, reducing the greenhouse impact.[69]

iv) Carbon sequestration in forests due to a lower demand for virgin paper; Although burning waste paper produces CO_2, the emissions will be balanced by the growth of new trees that absorb CO_2, that will lead to a life cycle of paper with a zero net emissions.[70]

v) Energy used in the long-distance transport of waste: Transporting recycled materials too far may counter the energy savings from recycling in relation to the energy used in transporting the materials.[71]

Wang and Stanisavljevic[72] add that 30-70% of waste generated at municipal landfill sites consists of organic wastes such as paper, food waste and garden waste. These wastes could rather be transformed into fertilisers or soil conditioners reducing GHG emissions by diminishing the use of chemical fertilisers and biogenic carbon in soils.

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68 Ackerman 2020 *IJJS* 224.
69 Ackerman 2020 *IJJS* 224.
70 Ackerman 2020 *IJJS* 224-225.
71 Ackerman 2020 *IJJS* 225-226; The collection, movement and processing of large volumes of waste causes the emission of CO_2 and N_2O from fossil sources. Wang and Stanisavljevic 2019 *Waste Management and Research* 1181
72 Wang and Stanisavljevic 2019 *Waste Management and Research* 1181.

1.5 South African legal framework, structure and role of local government[73]

South Africa is a democratic and constitutional state[74] with a three-sphere system of government, namely national, provincial and local government.[75] The three spheres of government are distinctive, inter dependent and interrelated and they all have legislative and executive authority.[76]

The Constitution provides for the establishment of local government that consist of municipalities covering the whole of South Africa.[77] The executive and legislative authority of a municipality are vested in its municipal council[78] and the municipality has the right to govern, on its own initiative the local government functions of its community.[79]

A primary object of local government for this study is to promote a safe and healthy environment.[80] Local government also has a constitutional mandate to promote an environment that is not harmful to the health and well-being of the community.[81] A municipality must furthermore protect the environment and take legislative and other measures to prevent pollution and ecological degradation, promote conservation and ensure ecologically sustainable development and use of natural

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73 Refer to chapter 4 for a detailed discussion on the role and function of local government relating to climate change and waste management.

74 Section 1 of the Constitution.

75 Section 40 of the Constitution.

76 Section 43 of the Constitution.

77 Section 151(1) of the Constitution.

78 Section 151(2) of the Constitution.

79 Section 151(3) of the Constitution.

80 Section 152(d) of the Constitution.

81 Section 24(a) of the Constitution.

resources.[82] Municipalities are also mandated to perform the function of waste management.[83]

The *Local Government: Municipal Structures Act*, 1998[84] provides for the establishment of municipalities, provide for the division of functions and powers between municipalities and to regulate the internal systems, structures, and office bearers of municipalities.[85] The *Local Government: Municipal Systems Act*, 2000[86] provides for the core principles, mechanisms and processes necessary for municipalities to perform its powers and duties.[87]

1.6 Research aim and objectives

This dissertation aims to establish what should be included in a comprehensive legal and policy framework for South African local government in relation to regulating, monitoring and evaluating compliance with legislation in implementing climate change mitigation factors for the function of waste management. The objectives of the dissertation are to determine: aspects:The international and South African national legal landscape relating to climate change;

- The South African local government landscape relating to climate change and waste management; and
- The compliance of eThekwini Metropolitan Municipality to the environmental legal landscape relating to climate change and waste management.

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82 Section 24(b) of the Constitution.

83 Section 156, read with part A of schedule 5 of the Constitution.

84 17 of 1998.

85 Long title of the *Structures Act*.

86 32 of 2000.

87 Long title of the *Systems Act*.

1.7 Research Methodology

The study includes a desk-top theoretical analysis of the concepts of climate change mitigation and waste management. The concepts are analysed against the backdrop of international and South African treaties, legislation and policies and the impact of these treaties, legislation and policies on the development of a legislative framework for South African local government. Relevant secondary literature is also reviewed during the course of the study.

1.8 Research Structure

The aim and objectives of the research dissertation and dealt with in the different chapters of the dissertation.

Chapter 1 introduces the research topic, setting the scene in addressing the phenomenon of climate change mitigation in relation to waste management and posing the research question. Chapter 2 deals with an overview of the international climate change legal framework. The UNFCCC, the *Kyoto Protocol* and the *Paris Agreement* are discussed as international protocols relating to climate change mitigation. Chapter 3 focusses on the South African waste management and climate change legal framework. The Constitution, the NEMA, the NEM:WA and specific responses of the National Government to climate change such as the *Climate Change Green and White Papers*, the *Climate Change Bill* and the *National Waste Management Strategy* as a peremptory consequence of the NEMA are discussed as they relate to local government, waste management and climate change. Chapter 4 focusses on the constitutional mandate of local government and national legislation such as the *Municipal Structures and Systems Acts* and the *Municipal Finance Management Act,* to ensure service delivery to communities in a sustainable manner and to promote a safe and healthy environment. Waste management as a local government function and the specific tools available to local government relating to climate change and waste management such as the IDP, By-laws and Waste Management Strategies are dealt with. Chapter 5 contains a case study of

the eThekwini Metropolitan Municipality from the point of view of a researcher to determine its legal response to waste management and climate change. A basic legal compliance matrix is utilised to evaluate the municipality's compliance with environmental legislation. A gap analysis in the compliance with legislation is performed and certain recommendations are proposed as to how the gaps identified could possibly be addressed. Chapter 6 concludes the study, answers the research question and makes recommendations relating to the establishment of a legal framework to regulate waste management in order to reduce its impact on climate change.

Chapter 2: International Climate Change Legal Landscape

2.1 Introduction

South Africa is part of the global community and is also experiencing the negative effects of climate change on the environment, health and socio-economic development.[88] The global community has taken notice of the potential dangers of climate change and has started to address mitigation and adaptation measures to curb the influence and effects of climate change. Through the facilitation of the United Nations (UN), international law and treaties have been developed, signed and ratified to address the matter of climate change and keep the global temperature warming between agreed levels.

South Africa is a member of the UN and as a member it is bound to the provisions of international law and treaties. In this chapter South Africa's obligation to honour international law and treaties is investigated in terms of the *Vienna Convention on Law of Treaties*, 1969 as well as the *Constitution of the Republic of South Africa, 1996*. South Africa is signatory to specific climate change conventions, protocols and agreements of which the UNFCCC, the *Kyoto Protocol* and the *Paris Agreement* are the most relevant to this study.

The UNFCCC, the *Kyoto Protocol* and the *Paris Agreement* are briefly discussed in this chapter to highlight their objectives, principles and mitigation commitments, and to establish how effective and efficient waste management should contribute to climate change mitigation. The duties and obligations created by the aforementioned international instruments relating to climate change mitigation and waste management that should be addressed by the South African government are addressed, and most importantly looking at the relevance thereof to local government as the sphere of government closest to the people and tasked with the execution of the function of waste management. It is already envisaged in this

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88 *South Africa's Third National Communication under the United Nations Framework Convention on Climate Change* 12 as published March 2018.

chapter that the legal landscape will cascade down from an international level to a national level and ultimately to a local government level, as the authority responsible for the function of waste management. This chapter will provide an overview of the international legal landscape relating to climate change mitigation and waste management as a mitigation measure and indicate how the international legal landscape is applicable to local government

2.2 International Law and its applicability to South Africa

International law is defined as "the body of rules binding states in their relations with one another and determining their mutual rights and obligations".[89] Rumsey and King[90] contend that environmental law provides how and to what extent organisations and communities must conduct themselves in matters affecting the environment and furthermore set the norms and the sanctions for deviating from such laws. International climate change law has basically four focus areas, i.e. the mitigation of climate change in limiting or preventing climate change, adaption to climate change in limiting its negative impact, funding and other resources to support mitigation and adaptation efforts, international oversight to facilitate the implementation and compliance, and evaluating the effectiveness of efforts being made.[91] International environmental law is governed by international instruments such as the UNFCCC, the *Kyoto Protocol* and the *Paris Agreement.*

South Africa has been a member of the United Nations since 24 October 1945[92] and has signed and ratified various international documents in relation to climate change, of which the most pertinent to this study is the UNFCCC*,* ratified on 29 August 1997,[93] the *Kyoto Protocol*, ratified on 31 July 2002,[94] and the *Paris*

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89 Orakhelahvili *Akehurst's Modern Introduction to International Law* 1.
90 Rumsey and King "Climate Change: Impacts, Adaptation, and Mitigation:Threats and Opportunities" 1048.
91 Bodansky, Brunnée and Rajamani *International Climate Change Law* 11.
92 UN 2020 https://www.un.org/en/library/unms? 9.
93 Centre for Environmental Rights 1994 https://cer.org.za/virtual-library/legislation/international-instruments/united-nations-framework-convention-on-climate-change-1992.
94 UNCC 2002 https://unfccc.int/node/61201.

Agreement, ratified on 1 November 2016[95] As a signatory to the aforementioned international instruments, South Africa is bound by the provisions of the instruments concerned, and its international duty to adhere to international instruments is further strengthened by articles 26 and 27 of the *Vienna Convention on the Law of Treaties*, 1969,[96] that provides that "every treaty in force is binding upon the parties and must be performed by them in good faith" and a "party may not invoke the provisions of its internal law as justification for its failure to perform a treaty".

In terms of the Constitution, South Africa may enter into international agreements[97] and such agreements bind the Republic.[98] International law is law in South Africa, unless it is inconsistent with the Constitution or national legislation.[99] International agreements become binding on South Africa after they have been approved by the National Assembly and the National Council of Provinces,[100] and they become law when they are enacted by national legislation.[101] A self-executing provision of an international agreement becomes law after approval by Parliament unless its provisions are inconsistent with the Constitution or national legislation.[102]

In terms of Chapter 6 of the *National Environmental Act* (NEMA),[103] South Africa may participate in international agreements. Chapter 6 sets out measures for the evaluation, monitoring and reporting on the progress of the implementation of such agreements.

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95 DFFE 2016 http://www.environment.gov.za/mediarelease/southafricasignsparisagreementonclimate.
96 *Vienna Convention on the Law of Treaties* (1969).
97 Section 231(1) of the Constitution.
98 Section 231(2) of the Constitution.
99 Section 232 of the Constitution.
100 Section 231(2) of the Constitution.
101 Section 231(4) of the Constitution.
102 Section 23194) of the Constitution.
103 *National Environmental Act* 107 of 1998.

2.3 International climate change legal landscape: defining climate change

2.3.1 United Nations Framework Convention on Climate Change (1992)[104]

The United Nations General Assembly addressed climate change for the first time in 1988 and adopted a resolution stating that it:

> Recognises that climate change is a common concern of mankind, since climate is an essential condition which sustains life on earth; (2) Determines that necessary and timely action should be taken to deal with climate change within a global framework…[105]

Subsequently, during the Rio Earth Summit of 1992 the UNFCCC was developed as a framework to address the phenomenon of climate change by limiting the average increase of global temperature.[106] The UNFCCC was adopted on 9 May 1992 and came into operation on 21 March 1994, after the fiftieth state's instrument of ratification had been deposited.[107]

The ultimate objective of the UNFCCC is:

> to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.[108]

The UNFCCC[109] defines "climate change" as:

> 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.

The UNFCCC[110] further defines "adverse effects of climate change" as:

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104 *United Nations Framework Convention on Climate Change* (1992).
105 Blobel *et al* (eds) *UNFCCC Handbook* 18-19.
106 UNCC 2021 https://unfccc.int/process/the-convention/history-of-the-convention#eq 1.
107 Blobel *et al* (eds) *UNFCCC Handbook*.
108 Article 2 of the UNFCCC (1992).
109 Article 1(2) of the UNFCCC (1992).
110 Article 1(1) of the UNFCCC (1992).

> changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.

To achieve the objective of the UNFCCC, article 3 provides specific principles guiding parties in their climate change efforts. Parties should protect the climate system for the benefit of present and future generations, subject to their common but differentiated responsibilities in relation to contributing to climate change and within their respective capabilities.[111] A further principle is that parties should prevent or limit the causes of climate change, mitigate the adverse effects of climate change[112] and to set larger responsibilities on developed nations for climate change under the principle of "common but differentiated responsibilities" due to the historical contribution of developed nations to the emission of GHGs into the atmosphere.[113] Broadly interpreted, the CBDR-RC places a duty on developed countries to cooperate with developing countries to achieve global sustainable development. The CBDR-RC principle is based on two components, namely a common responsibility on the one side and differentiated responsibility on the other.[114] Barnard[115] argues that the CBDR-RC principle entails that countries will have different standards imposed upon them to implement the common responsibility of protecting shared environmental resources, taking the discrepancies of their respective capacities into account. The concerns of developing countries relating to their responsibilities towards climate change are acknowledged in the Preamble of the UNFCC, in that the developed countries are historically and currently the larger contributors of GHG emissions and that the *per capita* contribution of emissions of developing countries remain relatively low.[116] Brunnée and Streck[117] contend that developing countries' contribution to global GHG emissions will grow as they

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111 Article 3(1) of the UNFCCC (1992).
112 Article 3(3) of the UNFCCC (1992).
113 Article 3(2) of the UNFCCC (1992).
114 Barnard 2012 *PELJ* 215.
115 Barnard 2012 *PELJ* 215.
116 Brunnée and Streck 2013 *Climate Policy* 592.
117 Brunnée and Streck 2013 *Climate Policy* 592.

develop to meet their social and development needs and that the UNFCCC recognises the legitimate priorities of poverty alleviation and economic growth of developing countries.[118] Parties to the UNFCCC have a right to promote sustainable development, but policies to protect the climate system against human influence should be incorporated in national development programmes.[119] Parties also have a duty to cooperate with and support other stakeholders in promoting sustainable economic development and growth for all, especially in developing countries.[120] Brunnée and Streck[121] express the opinion that there is a direct link between the implementation processes of developed- and developing-countries, as Article 4 of the UNFCCC provides that implementation by developing-countries will depend on the commencement of the funding commitments of developed countries. In summary, CBDR-RC provides that developed countries must make binding commitments to reduce their GHG emissions and are further responsible for financial and technological transfers to developing countries to assist them in their climate change adaptation and mitigation efforts. Developing countries do not have the responsibility to reduce their GHG emissions or to contribute funding towards climate change, due to their low contribution to existing GHG levels as well as their limited technological and economic capacity.[122]

Article 4 of the UNFCCC allows for parties to commit to the provisions of the Convention and to cooperate in achieving the objectives of the Convention. Parties commit to publishing to the Conference of the Parties (COP) their national inventories of anthropogenic emissions by source and the removals by sinks of all GHGs,[123] as well as to indicate the measures they have taken to mitigate climate change.[124] Article 12 of the UNFCCC sets out the detail that should be included in

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118 Brunnée and Streck (2013: 593) highlight a problem with the CBDR principle, however, in that the common but differentiated responsibilities principle is also based on the respective capabilities of countries, and by focussing on capabilities rather than responsibilities, developed countries concede that countries with the capacity to do so should address climate change.

119 Article 3(4) of the UNFCCC (1992).

120 Article 3(5) of the UNFCCC (1992)

121 Brunnée and Streck 2013 Climate Policy. 592.

122 Bortscheller 2010 *Sustainable Development Law and Policy* 50.

123 Article 4(1)(a) of the UNFCCC (1992).

124 Article 4(1)(b) of the UNFCCC (1992).

the communication. South Africa published its initial National Communication in terms of article 12 of the UNFCCC in 2004, followed by the Second Communication in 2011 and the Third National Communication in 2018.[125]

Article 7 of the UNFCCC establishes a Conference of the Parties (COP), which is the supreme body of the Convention, with the duty to review the implementation of the Convention and any related legal instruments that the COP may adopt.[126] Local and subnational governments are recognised as "government stakeholders" of the UNFCCC in paragraph 7 of the Cancun Agreements adopted by the COP in 2010.[127]

Mitigation as a climate change strategy contributes to the objective of the UNFCCC.

2.3.2 Kyoto Protocol (1997)[128]

In 1996, in its *2nd Assessment Report* the IPCC concluded that "the balance of evidence suggests a discernible human influence on the global climate that posed hazards to human and economic development, and recommended cost-effective steps to be taken to safeguard against these hazards".[129]

Taking cognisance of the IPCC *2nd Assessment Report*, the COP adopted the *Kyoto Protocol* in December 1997, that determines individual, legally binding targets for industrialised countries to limit the emission of GHGs.[130] South Africa ratified the *Kyoto Protocol* on 31 July 2002[131] and it came into force on 16 February 2005 after a complex ratification process.[132]

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125 *South Africa's Third National Communication under the United Nations Framework Convention on Climate Change*, 2018 10.
126 Article 7(2) of the UNFCCC (1992).
127 *Cancun agreements outcome of the work of the Ad Hoc Working Group on the long-termCooperative Action under the Convention* (2010).
128 *Kyoto Protocol to the United Nations Framework Convention on Climate Change* (1997).
129 IPCC 1995 *2nd Assessment Report, Climate Change* 22.
130 Blobel *et al* (eds) *UNFCCC Handbook* 19.
131 UNCC 2002 https://unfccc.int/node/61201.
132 UNCC 2021 https://unfccc.int/kyoto_protocol#:~:text=The%20Kyoto%20Protocol%20was%20adopted,Parties%20to%20the%20Kyoto%20Protocol.

The *Kyoto Protocol* is an international agreement under the UNFCCC the major objective of which is to determine GHG emission reduction targets for developed countries and establish a GHG emission trading scheme.[133] Article 3(1) provides a collective reduction target of overall emissions of GHG listed in the protocol by at least 5% below 1990 levels in the commitment period 2008 to 2012. The *Kyoto Protocol* categorises countries as those with developed economies[134] and those that are in the process of development.[135] Annex 1 countries had specific GHG reduction targets for the first commitment period and Annex 2 countries did not have specific targets. South Africa is an Annex 2 country and did not have an obligation to reduce its GHG emissions to a specific target. Although South Africa did not have to commit to specific targets, article 10 of the *Kyoto Protocol* provides for a general commitment of the parties. South Africa should formulate, within its capability, appropriate cost-effective national and regional programmes to decrease the quantity of its local emissions.[136] Furthermore, South Africa should formulate and implement appropriate regional programmes to address climate change mitigation and adaptation measures[137] with reference to specific sectors such as agriculture, transport, energy, industry, forestry and waste management.[138] The aforesaid has the implication that South Africa has an obligation to formulate and implement mitigation measures and programmes to reduce the emission of GHGs in the waste management sector. The Protocol commits South Africa to cooperate in the development of environmentally compliant technologies, know-how and practices relating to climate change, and the private sector should be included in this effort.[139] South Africa should also evaluate and monitor the outcomes of its response strategies in terms of its impact on climate change and the economic and social consequences.[140] Education and training programmes should be developed and

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133 Article 2 of the *Kyoto Protocol* (1997).
134 Annex 1 of the *Kyoto Protocol* (1997).
135 Annex 2 of the *Kyoto Protocol* (1997).
136 Article 10(a) of the *Kyoto Protocol* (1997).
137 Article 10(b) of the *Kyoto Protocol* (1997).
138 Article 10(b)(i) of the *Kyoto Protocol* (1997).
139 Article 10(c) of the *Kyoto Protocol* (1997).
140 Article 10(d) of the *Kyoto Protocol* (1997).

implemented to facilitate public awareness regarding climate change and access to information.[141] Finally the protocol provides that South Africa should in its national communication submit information on the implementation of its commitments under the *Kyoto Protocol* relating specifically to programmes and activities mitigating climate change.[142] The *Kyoto Protocol* initially started as a framework agreement but progressed into sets of articles that are legally binding on all parties to the protocol.[143]

The *Kyoto Protocol*[144] identifies methane (indicated in paragraph 1.4 as originating from landfill, amongst other sources) as one of the contributors to climate change.[145] The parties to the *Kyoto Protocol* commit under Article 2 to limit and/or reduce Methane emissions through its recovery in the waste management sector and the production of energy.

In terms of the *Kyoto Protocol* the sectors/sources of GHGs are identified and in terms of article 2 parties are encouraged to establish reforms in the relevant sectors to limit or reduce the emission of GHGs. The following categories of waste are identified as sectors/source categories, namely:[146]disposal of solid waste on land; handling of wastewater; and waste incineration, amongst others.[147]

With the setting of targets in limiting or reducing GHG emissions, such targets have obtained an economic value. The *Kyoto Protocol* makes provision for three market-based mechanisms, namely emissions trading, the clean development mechanism, and joint implementation. These mechanisms aim to assist countries in reaching

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141 Article 10(e) of the *Kyoto Protocol* (1997).
142 Article 10(f) of the *Kyoto Protocol* (1997).
143 Dumanski 2004 *Climate Change* 255.
144 Annex A to the *Kyoto Protocol* (1997).
145 The other GHGs include Carbon dioxide (CO_2), Nitrous oxide (N_2O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride (SF_6).
146 Annex A to the *Kyoto Protocol* (1997).
147 "Other" is not specifically defined in the *Kyoto Protocol*.

their emission targets as well as to create opportunities for the developing countries and the private sector to make a contribution to the efforts of emission reduction.[148]

Article 6 of the Protocol makes provision for Joint Implementation (JI), where a country may off-set its emission-reduction target by participating in another country's emission-reduction project under the Protocol and allocate the emission reduction units to its own targets. Emission reduction units (ERUs) earned under JI projects are equal to one tonne of CO_2. To claim emission reductions, the reductions must be real, measurable, verifiable and over and above the reductions that would have occurred if the project was not undertaken.[149]

Article 12 of the protocol establishes a clean development mechanism (CDM) to assist developing countries to achieve sustainable development and to contribute to the reduction of GHG. In participating in a CDM, a developing country such as South Africa will assist developed countries in achieving their commitments and targets in terms of the Protocol.[150] Certified emission reduction (CER) credits for emission-reduction projects under the CDM are earned, each credit equal to one tonne of CO_2. CER credits can then be traded to developed countries to form part of their emission reduction commitments.[151]

Article 17 of the Protocol provides for emissions trading between countries with commitments under the Protocol. Emission units can be acquired from another country and be allocated to its own emission-reduction commitments to reach its set targets. Such trading should be done over and above any domestic actions in emission reduction.

The CDM and JI are mechanisms under the *Kyoto Protocol* that developed countries can use to meet their emission reduction commitments through investing in projects

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148 UNFCCC 2007 *The Kyoto Protocol Mechanisms* 2.

149 UNFCCC 2007 *The Kyoto Protocol Mechanisms* 2. Also see Shishlov and Bellassen 2016 *Climate Policy* 703. Monitoring, reporting and verification (MRV) processes are followed to validate the environmental integrity of carbon offset projects, to ensure that emission reductions claimed under the CDM are "real, measurable and additional".

150 Article 12(1) of the *Kyoto Protocol* (1997).

151 UNFCCC 2007 *The Kyoto Protocol Mechanisms* 3.

implemented by developing countries.[152] The basis of CDM and JI is that investing in the efforts of another country to reduce GHG emissions is credited to the investing country as part of its commitment to reducing GHG emissions. A CDM project involves cooperation between a developing country and a JI developed country, whereby the developed country offsets its own emissions against the reduction of emissions in the developing country. Details of the CDM and JI projects are available from the UNFCCC website.[153]

In terms of waste management, waste is regarded as material that no-one wants, but which can be turned into a resource with value in obtaining ERUs for the JI, or CERs for the CDM. Projects such as waste to energy or utilising waste as raw material for production can be entered into for CDM or JI projects.[154] Most waste projects involve LFG capture, the conversion of waste to energy, and composting projects. Waste-related projects represent approximately 18% of all CDM projects.[155]

2.3.3 Paris Agreement (2015)[156]

After the adoption of the *Kyoto Protocol*, numerous rounds of UNFCC negotiations and COPs took place with the objective of establishing a legally binding climate change regime. All the COPs and negotiations culminated in the *Paris Agreement* of 2015.[157]

The *Paris Agreement* was adopted as a decision of the COP to the UNFCCC. The Agreement is a treaty as a matter of international law, and replaced the *Kyoto Protocol*. The intention of the COP was to create a legally binding agreement, as can be deduced from the provision of final clauses addressing matters such as

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152 UNEP *Waste and Climate Change: Global Trends and Strategy Framework* 44.
153 UNCC 2021 http://unfccc.int/kyoto-protocol/mechanisms/items/1673.php.
154 Tjell 2006 *Waste management and Research* 195.
155 UNEP *Waste and Climate Change: Global Trends and Strategy Framework* 44.
156 *Paris Agreement* (2015).
157 Carter and Barnard "Demystifying the Global Climate Change Regime" 3-21.

signature, ratification, entry into force and the depository function.[158] The choice of the title "*Paris Agreement*" is also significant, as the *Vienna Convention* defines a treaty as "an international agreement concluded between states in written form and governed by international law … whatever its particular designation".[159] The *Paris Agreement* also reflects the legally binding character of various provisions. In some provisions the term "shall" is used, thereby creating legal obligations. Other provisions utilise the terms "should" or "encourage", thereby creating different levels of obligation.[160]

The *Paris Agreement* enhances the implementation and objective of the UNFCCC by strengthening the global response to climate change, taking into account sustainable development and eradicating poverty.[161] The Agreement intends to achieve its objective by:

- keeping the increase in the global average temperature to well below 2°C above pre-industrial levels and limiting the temperature increase to 1,5°C above pre-industrial levels. The risks and impacts associated with climate change would significantly be reduce if these goals could be reached,[162]
- unlocking funding to implement climate change projects,[163] and
- increasing climate resilience and undertake development with low-GHG emissions not affecting food production.[164]

Further objectives of the *Paris Agreement* could be summarised as follows:

- Parties should aim for GHG emissions to peak as soon as possible and to achieve zero-emission in the second half of the century. Rapid reductions

158 Bodansky 2017 *AJIL* 296.
159 Article 2(1)(a) of the *Vienna Convention.*
160 Bodansky 2017 *AJIL* 297.
161 Article 2(1) of the *Paris Agreement* (2015).
162 Article 2(1)(a) of the *Paris Agreement* (2015).
163 Article 2(1)(c) of the *Paris Agreement* (2015).
164 Article 2(1)(b) of the *Paris Agreement* (2015).

should be implemented after the peak has been reached to obtain a balance between the reduction of anthropogenic emissions by source and removals of GHG by sinks in the second half of this century;[165]

- Individual countries are to set nationally determined contributions (NDC) as a requirement for mitigation measurements and revise their NDCs every 5 years.[166] Developed countries should continue to adopt economy-wide absolute emission reduction targets, whilst developing countries should aim for such targets over time, taking their different national circumstances into account.[167]

The *Paris Agreement* makes the commitment to NDCs compulsory for all parties in establishing procedural duties and responsibilities, and parties must "pursue domestic mitigation measures, with the aim of achieving the objective of their contributions".[168] The principle of CBDR-RC is a common thread in climate change and found its origin in the UNFCCC and the *Kyoto Protocol* and has two fundamental principles: firstly the historical difference of parties being responsible for and contributing towards climate change and secondly, the difference of parties being capable of implementing measures to address climate change.[169] The *Paris Agreement* moved away from the differentiation of parties by categorising them in Annex 1 (developed countries) and Annex 2 (developing countries) but continued with the differentiation, although in a more particularised manner based on the different elements of the CBDR-RC:[170]

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165 Article 4(1) of the *Paris Agreement* (2015).

166 South Africa submitted its NDC on 25 September 2015. South Africa commits to a "peak, plateau and decline" approach, with the goal that emissions would peak between 2020 and 2025, plateau for approximately a decade, and then commence to decline. Carbon Brief Clear on Climate 2018 *The Carbon Brief Profile: South Africa* 2.

167 Articles 4(2) and 4(9) of the *Paris Agreement* (2015).

168 Bodansky 2017 *AJIL* 297.

169 Bodansky 2017 *AJIL* 298.

170 Bodansky 2017 *AJIL* 300.

- The procedural commitments relating to NDCs allow countries to move over time to reach economy-wide absolute emission reduction targets;[171]
- The NDCs provides for self-differentiation;
- The transparency framework takes the capacity of parties into account and provides for built-in flexibility to developing countries that need it;[172]
- The provisions pertaining to developed and developing countries relative to finance, technology and capacity building relating to NDCs are based placed a more categorical basis;[173]
- Parties should account for their NDCs in a clear, transparent and understandable manner;[174]
- There are mechanisms for countries to achieve NDCs through sharing mitigation targets,[175] cooperation between countries or transferring "mitigation outcomes" internationally either by emission trading or to allow result-based payments.[176]
- The Agreement establishes a sustainable development mechanism (SDM) that allows private and public entities to support climate change mitigating projects that generate transferrable GHG emissions.[177] The characteristics of the SDM are similar to those of the CDM.

Article 13 of the Agreement establishes a transparency framework for parties to make available information to track the progress they have made with the implementation and achievement of their NDCs and to record their emissions in national inventory reports. The information submitted will be reviewed by experts

171 Articles 4(2), 4(6), 4(8), 4(9) and 4(13) of the *Paris Agreement* (2015).
172 Articles 13(1) and 13(2) of the *Paris Agreement* (2015).
173 Bodansky 2017 *AJIL* 300.
174 Article 4(8) of the *Paris Agreement* (2015).
175 Article 6(1) of the *Paris Agreement* (2015).
176 Article 6(2) of the *Paris Agreement* (2015).
177 Article 6(4) the *Paris Agreement* (2015).

subject to the scrutiny's being "facilitative, non-intrusive, non-punitive and respectful of national sovereignty".[178]

The COP will monitor the implementation of the Agreement to evaluate the collective progress in reaching the long-term goals of the Agreement.[179] The first stocktake will be in 2023 and stocktaking will thereafter be performed every five years.[180]

Powell *et al*[181] finds that 137 countries identified waste sector mitigation commitments in their NDCs that covered 85% of the global waste sector emissions. They indicate that improved landfilling, that includes the closing and rehabilitation of redundant landfill sites and the development of new or the enhancement of existing landfills, is the most frequently cited mitigation measure. Energy recovery from waste and landfill gas-to-energy projects were the second most frequently cited mitigation measures. Powell *et al*[182] further indicate that NDCs make limited mention of improved waste collection as a mitigating action, and many countries are at the early stages of establishing waste recycling and disposal schemes. Powell *et al*[183] contend that efforts to reduce GHG emissions are mostly based on actions directly reducing emissions, but that waste reduction and prevention actions could further reduce emissions. It is suggested that countries should include such mitigating actions in their future NDCs.

2.4 Implications of international law for local authorities

The Rio Declaration on the Environment and Development, (1992)[184] (*Rio Declaration*), identified the role of local government and that provides as follows:

> Because so many of the problems and solutions being addressed by Agenda 21 have their root in local activities, the participation and cooperation of local

178 Article 13(3) of the *Paris Agreement* (2015).
179 Article 14(1) of the *Paris Agreement* (2015).
180 Article 14(2) of the *Paris Agreement* (2015).
181 Powell *et al* 2018 *Waste Management* 139.
182 Powell *et al* 2018 *Waste Management* 140.
183 Powell *et al* 2018 *Waste Management* 140.
184 The *Rio Declaration on the Environment and Development* (1992).

> authorities will be a determining factor in fulfilling its objectives. Local authorities construct, operate and maintain social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development.[185]

The *Rio Declaration* recognises that service delivery to local communities contributes towards climate change. Local government as the responsible institution for rendering these services are therefore best suited to address the climate change challenges by adapting its planning processes and implementing environmental legislation and policies. Local and subnational governments are recognised as "government stakeholders" of the UNFCCC.[186]

The need was recognised to engage with subnational and local government for the effective implementation of actions on climate change. An advocacy group for local authorities worldwide, the Local Government Climate Roadmap (LGCR), was established in 2007 to voice the inputs of local authorities relating to climate change matters.[187] Local Governments for Sustainability (ICLEI), which is a major stakeholder of the LGCR, is a global network of local and regional governments working towards sustainable urban development. It assists local authorities and municipalities to respond *inter alia* to climate change.[188] At the UN Climate Change Conference in Bali,[189] local governments and world mayors launched the World Mayors and Local Governments Climate Protection Agreement to commit to addressing climate change and to take action against global warming.[190] Various provincial governments and local authorities, such as the City of Cape Town and eThekwini metropolitan municipalities are members of ICLEI.[191] Through the

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185 Clause 28.1 of the *Rio Declaration* (1992).

186 Para 7 of the *Cancun agreements outcome of the work of the Ad Hoc Working Group on the long-termCooperative Action under the Convention* (2010).

187 Local Government Climate Roadmap Secretariat 2021 http://old.iclei.org/index.php?id=1196.

188 ICLEI 2021 https://iclei.org/en/About_ICLEI_2.html.

189 Held in Bali from 3 to 14 December 2007. Local Government Climate Sessions were held from 10 to 11 December 2007.

190 Local Government Climate Roadmap Secretariat 2021 http://old.iclei.org/index.php?id=1201.

191 ICLEI 2021 https://oc;eo/org/en/members-search.html?region=Africa.

aforesaid organisations, local government can influence climate change matters at the UNFCCC.

The decision of COP21, adopting the *Paris Agreement*, calls upon cities and other subnational authorities to take stronger and more ambitious climate change action. Part 5 of the decision relates specifically to non-party stakeholders such as cities and other subnational authorities and calls on them to increase their efforts and support actions to reduce emissions and to address the adverse effects of climate change.[192] Local government should therefore strive to achieve the objectives of the *Paris Agreement.*

According to the UNEP *2015 Emissions Gap Report*,[193] cities can cooperate and act on climate change mitigation by focussing their initiatives on the following roles:

- Promoting reduction in emissions by sharing knowledge, building capacity and providing technical support for project planning and implementation;
- Involving communities in becoming climate resilient;
- Influencing policy makers at other levels by representing common city-level interests;
- Implementing climate mitigation plans and striving towards climate-resilient economic development plans;
- Being transparent and accountable by implementing best practice GHG reporting; and
- Providing funding and attracting investors to implement low carbon projects.

In the South African context government is made up of three spheres of government, namely national, provincial and local government and the local sphere of government is made up of municipalities. A municipality is defined as "an organ of state in the local sphere of government exercising legislative and executive

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192 *COP21 Adoption of the Paris Agreement* (2015).
193 UNEP 2015 *Emissions Gap Report 2015* 36-37.

authority in its demarcated area of jurisdiction". Municipalities have the right to govern on their own initiative all of their functions and duties, although subject to national and provincial legislation.[194] Agreements that bind the government of South Africa also bind local government. Municipalities therefore have an obligation to answer the clarion call of the global community, made through the *Paris Agreement*, to address climate change mitigation. As indicated earlier in this study,[195] the waste sector contributes to GHG emissions. Municipalities, as the authorities responsible for waste management, could implement effective and efficient waste management strategies in order to mitigate the impact of climate change. Wang and Stanisavljevic[196] contend that climate change mitigation creates the following opportunities for the waste sector to transform itself towards reaching the goals of sustainable development:

- Climate change could be the motivation for improving existing waste management practices in such a way as to lead to integrated sustainable waste management systems;
- Climate change could be the catalyst to bring about the more efficient utilisation of renewable resources and energy, where the generation of fertilisers, soil conditioners and energy from waste could have an impact;
- Climate change could promote sustainable development and eradicate poverty by shifting from a linear economy to a circular economy.[197]

2.5 Conclusion

It is clear in this chapter that the global community has taken note of the existence of climate change and has realized that something should be done to mitigate its adverse effects. In responding to climate change and under the auspices of the UN

194 Du Plessis *Environmental Law and Local Government* 24-25.
195 Refer to para 1.4.
196 Wang and Stanisavljevic 2019 *Waste Management and Research* 1181.
197 Wang and Stanisavljevic 2019 *Waste Management and Research* 1181.

the global community has established an international climate change legal framework to regulate and guide actions to limit the effects of climate change.

It is indicated that South Africa, as part of the global community and a member of the UN, is bound by the international instruments. As South Africa is a signatory to the international instruments and has ratified them, the provisions of the Vienna Convention make this so. Further, the Constitution provides that South Africa may enter into international agreements and is then bound by them unless they are inconsistent with national legislation.

The various international instruments were then elucidated, i.e. the UNFCCC, the *Kyoto Protocol* and the *Paris Agreement*, in terms of their objectives, principles, and commitment to mitigation by the parties to the international instruments. A golden thread throughout all the instruments is the objective of limiting and reducing GHG emissions into the atmosphere to reach GHG concentration levels that would not have an adverse impact on the climate system. Mechanisms to achieve the ultimate objective are set in place and discussed, which mechanisms take into account the principle of the CBDR-RC of the parties.

The chapter concluded by showing that local government is among the subnational authorities and cities referred to by the international instruments, and should therefore also comply with the provisions of international climate change law. The specific mandate of local government in this broader international landscape is not set out clearly enough to enable local government to take up its rightful place in the fight against climate change. It will therefore be necessary in the following chapters to trace how climate change legislation and climate change mandates cascade down to the local sphere of government. Consequently, the next chapter focusses on an overview of South African environmental legislation relating to climate change and waste management.

Chapter 3: South African Environmental Law and the Climate Change Legal Landscape

3.1 Introduction

This chapter focusses on an overview of the South African environmental legislation relating to climate change and waste management. The Constitution is analysed to determine the constitutional mandate of all spheres of government in relation to the protection of the environment. Focus is placed on the mandate of the Constitution given to the different spheres of government to promulgate legislation for the protection of the environment *inter alia* through climate change mitigation actions in general and in the waste sector in particular to achieve the goals set in the NDC. Flowing from the Constitution, national legislation impacting on environmental matters and waste management is analysed with specific reference to the NEMA and the NEM:WA relative to its objects, its principles and the responsibilities it creates for organs of the state, especially local government. Attention is also given to the *National Climate Change Green Paper* and the *National Climate Change White Paper,* which preceded the *National Climate Change Bill*. The *National Waste Management Strategy* is reviewed as a guiding policy document for the implementation of waste management in terms of its founding principles, strategic pillars, outcomes and key intervention actions. Lastly the waste management hierarchy is discussed, as it is one of the tools to reduce waste, reduce the emission of GHGs, and reduce the impact on human health.

3.2 Constitution of the Republic of South Africa, 1996[198]

In terms of Chapter 1 of the *Constitution of the Republic of South Africa,* 1996 (Constitution), South Africa is a constitutional state. The Constitution is the supreme law of the Republic and any law inconsistent with it is invalid.[199] The principle of the rule of law is also set as one of the founding provisions and the obligations

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198 *Constitution of the Republic of South Africa,* 1996.
199 Section 2 of the Constitution.

imposed by the Constitution must be fulfilled.[200] Therefore, legislation and subordinate legislation has to be consistent and aligned with the provisions of the Constitution.

With regard to environmental matters and climate change, the Bill of Rights affords everyone the right to an environment that is not harmful to their health or well-being.[201] They have the right that the environment must be protected for the benefit of the current and future generations by putting in place reasonable legislation and other measures to prevent pollution and ecological degradation. They have a right to conservation and ecologically sustainable development and the right that natural resources will be used to promote justifiable social and economic development.[202] Section 24 of the Constitution is referred to as the environmental right. It gives individuals an essential human right and the right to the protection to their health and well-being against harm.[203] The Constitutional Court judgment in *Fuel Retailers Association of Southern Africa v Director General Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province* confirmed that environmental rights form the basis for basic human existence.[204] Ngcobo J remarked that:

> The importance of the protection of the environment cannot be gainsaid. Its protection is vital to the enjoyment of the other rights contained in the Bill of Rights; indeed, it is vital to life itself. It must therefore be protected for the benefit of the present and future generations

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200 Section 1 of the Constitution.

201 Section 24 of the Constitution

202 Section 24 of the Constitution, which reads as follows:
"Everyone has the right-
(a) To an environment that is not harmful to their health or well-being; and
(b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that-
(i) Prevent pollution and ecological degradation;
(ii) Promote conservation; and
(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

203 Kidd *Environmental Law* 22.

204 *Fuel Retailers Association of Southern Africa v Director General Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province* 2007 6 SA 4 (CC) para 102.

Continued environmental degradation threatens all aspects of human life, including health and livelihoods and could ultimately impact on its the continued existence.[205]

The state, which includes local government,[206] must respect, protect and fulfil the rights in the Bill of Rights,[207] and local government therefore has a constitutional mandate to protect the environment, which will include climate change mitigation. Du Plessis[208] describes local government as a "co-responsible organ of state" which must adhere to the provisions of section 24, which provisions impose positive duties on local government to respect, protect, promote and give effect to environmental rights. The Constitution grants municipalities a wide scope in exercising its authority in response to climate change and also protects such governing power.[209] In *Maccsand v City of Cape Town*[210] the Constitutional Court confirmed the autonomy of municipalities relating to land-use management in that developments such as mining projects, that is often authorised at national and provincial level, can only proceed if such projects are also adhering to the land-use management plans and zoning schemes of the municipality.

The Constitution also mandates local government to ensure service delivery to communities in a manner that is sustainable in future and to promote a safe and healthy environment.[211] In terms of parts B of schedules 4 and 5 of the Constitution, which set out the functions of local government, waste management is mentioned as a specific function of local government, which function local government must perform within the regulatory framework set by the Constitution in ensuring the protection of the environment provided for in section 24 of the Constitution.[212]

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205 Feris 2008 *SAJHR* 33.
206 Section 239 of the Constitution.
207 Section 7 of the Constitution.
208 Du Plessis 2010 *Stell LR* 267.
209 Du Plessis and Kotzé 2014 JAL 14.
210 *Maccsand (Pty) Ltd v City of Cape Town* 2012 4 SA 181 (CC) para 48.
211 Section 152 of the Constitution.
212 Section 84 of the *Local Government: Municipal Structures Act* 117 of 1998 (hereinafter referred to as the *Municipal Structures Act*) provides for the division of functions and powers between district and local municipalities. Section 84(1)(e) of the *Municipal Structures Act* determines "solid waste disposal sites, in so far as it relates to the determination of a waste disposal

However, in the case of *Le Sueur v Ethekwini Municipality*[213] the court held that the functions contained in schedules 4 and 5 of the Constitution are not exhaustive for each sphere of government and the functions should be read together with the provisions of section 24 of the Constitution to the effect that the said powers are not meant to be executed in silos.[214] It was therefore found that the functions to promote ecologically sustainable development or to promote conservation are not only national and provincial functions.[215] These functions may also be executed by local government when it exercises its powers and performs its functions as required by parts B of schedules 4 and 5 in effecting the mandate to promote a "safe and healthy environment" as provided for in section 152(1) of the Constitution.[216] Du Plessis[217] avers that the *Le Sueur* case "judicially confirmed that local government possesses powers that enable its active participation in the pursuit of the constitutional environmental agenda".

In terms of section 151(2) and (3) of the Constitution, municipal councils are vested with executive and legislative authority and have the right to govern the local government affairs of their communities. Section 156(2) of the Constitution provides that "a municipality may make and administer by-laws for the effective administration" of its functions. The Constitutional Court in *Fedsure Life Assurance Ltd v Greater Johannesburg Transitional Metropolitan Council* confirmed the

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strategy; the regulation of waste disposal; the establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for more than one local municipality in the district"; as a district municipal function. All the other matters relating to solid waste disposal sites remain the function of local municipalities, as section 84(2) of the *Municipal Structures Act* provides that a local municipality has the functions and powers referred to in Parts B of schedule 4 and 5 of the Constitution, excluding those functions and powers vested in terms of section 84(1) in the district municipality in whose area it falls. In terms of Section 85(1) of the *Municipal Structures Act*, the MEC for local government in a province may, under certain prescribed conditions, adjust the function of solid waste disposal sites from a local to a district municipality or *vice versa*, if a local or district municipality does not have the capacity to perform the function or power.

213 *Le Sueur v Ethekwini Municipality* (9714/11) [2013] ZAKZPHC 6 (30 January 2013).

214 *Le Sueur* (KZP) para 19.

215 *Le Sueur* (KZP) para 20.

216 Glazewski and Du Toit *Environmental Law* Chapter 6-17.

217 Du Plessis 2015 *PELJ* 1860.

legislative authority of local government.[218] Section 151(3) of the Constitution, however, has a subjective provision for local government in the governance of its functions, in that local government must govern its affairs subject to national and provincial legislation. Therefore, it is imperative for this study to consider the national and provincial environmental legislative framework impacting on the functions of local government relating to environmental matters, climate change and waste management.

Section 24(b) of the Constitution obligates government to ensure that environmental rights are enforced by reasonable legislation and other measures.[219] This principle of a legislative measure was affirmed in the *Grootboom* case[220] where Yacoob J stated:

> The State is required to take reasonable legislative and other measures. Legislative measures by themselves are not likely to constitute constitutional compliance. Mere legislation is not enough. The State is obliged to act to achieve the intended result, and the legislative measures will invariably have to be supported by appropriate, well-directed policies and programs implemented by the Executive. These policies and programs must be reasonable both in their conception and their implementation. The formulation of a program is only the first stage of meeting the State's obligation. The program must also be reasonably implemented. An otherwise reasonable program that is not implemented reasonably will not constitute compliance with the State's obligation.

The Grootboom case confirms the direct responsibility of the state, not only to make legislation, but also to make policies and formulate strategies and programs to implement its legislation.

Feris[221] states that section 24(b) of the Constitution places a specific duty on provincial and local government to regulate in favour of environmental protection and sustainable development and section 24 may be invoked in terms of section 7(2) of the Constitution if it fails to respect, protect, promote or fulfil the

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218 *Fedsure Life Assurance Ltd v Greater Johannesburg Transitional Metropolitan Council* 1999 1 SA 374 (CC) para 42.

219 Van der Bank and Karsten 2020 *Air, Soil and Water Research* 6.

220 *Government of the Republic of South Africa v Grootboom* 2001 1 SA 46 (CC) para 42.

221 Feris "Environmental rights protected in the Constitution" 224.

environmental rights in the execution of its functions in terms of parts B of schedules 4 and 5 of the Constitution.

The constitutional mandate to the different spheres of government relating to the protection of the environment and implementing climate change mitigation actions is clear, especially in the waste sector. Therefore, it would be prudent to analyse the South African national climate change legal response in giving effect to this constitutional mandate.

3.3 South African national climate change legal response

3.3.1 Nationally Determined Contribution

3.3.1.1 2015 National Determined Contribution

The Nationally Determined Contribution (NDC) is the basis of the *Paris Agreement* and the means of achieving long-term climate change goals. The NDC enunciates the efforts to be made by each country to limit and reduce national emissions and adapt to the impacts of climate change.[222] South Africa submitted its Intended National Determined Contribution in terms of the *Paris Agreement* in October 2015, which became its NDC[223] after the ratification of the *Paris Agreement*.[224] South Africa acknowledges that there is no doubt that the climate system is warming and that additional mitigation actions by all stakeholders are required to avert the potential catastrophic global impact of climate change. South Africa submits that, as one of the poor countries, it is least responsible for the challenge of global climate change but is most vulnerable to the impact of climate change.[225] South Africa's commitment is based on science and equity. It therefore believes in that the global comity should promote equitable access to sustainable development and that those

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222 UNFCCC 2021 https://unfccc.int/process-and-meetings/the-paris-agreement//nationally-determined-contributions-ndcs/.

223 DEA 2015 *South Africa's Intended Nationally Determined Contribution*.

224 DFFE 2021 http://environment.gov.za/mediarelease/creecy_indc2021draftlaunch_climatechangecop26.

225 DEA 2015 *South Africa's Intended Nationally Determined Contribution* 3.

states with greater responsibility for cumulative emissions contributing to higher GHG concentrations should as a principle of fairness assist those parties less responsible.[226] Although it is recognised that South Africa needs to put a mitigation system in place to achieve a low-carbon economy and move to net-zero GHG emissions, zero poverty needs to be prioritised as an over-riding goal, due to the fact that poor communities are most vulnerable to the adverse impacts of climate change.[227]

Substantial global emission reductions are needed to keep the global temperature rise well below 2°C and a peak, plateau and decline trajectory will contribute to limiting the growth of emissions, to addressing poverty, and to the move to a low carbon future.[228] South Africa committed to a peak, plateau and decline GHG emissions trajectory range. GHG emissions should peak in the period 2020 to 2025, with a lower and upper limit of 398 $MtCO_2e$ and 583 $MtCO_2e$ respectively. After the peak, the GHG emissions will then plateau for up to ten years with a lower and upper limit of 398 $MtCO_2e$ and 614 $MtCO_2e$ respectively. Continuing from 2036, emissions will decrease in absolute terms with a lower and upper limit of 212 $MtCO_2e$ and 428 $MtCO_2e$ by 2050 respectively.[229]

The scope and coverage of the NDC relate to all sectors of the economy, with the waste sector identified as one of the focus areas, with specific focus on three GHGs, namely CO_2, CH_4 and N_2O.[230]

3.3.1.2 2021Updated National Determined Contribution

South Africa's UNDC was approved by Cabinet on 24 March 2021 and represents South Africa's updated commitment to contribute to the global climate change

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226 DEA 2015 *South Africa's Intended Nationally Determined Contribution* 3-4.
227 DEA 2015 *South Africa's Intended Nationally Determined Contribution* 5.
228 DEA 2015 *South Africa's Intended Nationally Determined Contribution* 10.
229 DEA 2015 *South Africa's Intended Nationally Determined Contribution* 8-9. The timeframes are "2025 (firm), 2030 (indicative) and 2050 (aspirational) and the trajectory range is consistent with a 42% deviation below a business-as-usual emissions growth trajectory". The NDC reflects South Africa's full mitigation potential.
230 DEA 2015 *South Africa's Intended Nationally Determined Contribution* 9.

effort. The UNDC was submitted at the 26th COP held in Glasgow, Scotland in November 2021.[231] The UNDC is not the second NDC, as the second NDC should be communicated in terms of the *Paris Agreement* only in 2025, but it updates and enhances[232] the 2015 NDC to meet the obligation under the *Paris Agreement* to communicate NDCs every five years.[233] The structure of the UNDC is consistent with that of the first NDC and addresses the same components of adaptation and mitigation to implement climate change efforts.

The UNDC builds on the NDC and includes South Africa's highest realistic ambition for climate change, using on science and equity as a basis and also taking the requirement of national development and the circumstance of poverty into account[234]. The UNDC sets new progressive mitigation targets, reducing the upper range of the 2025 and 2030 targets set in the NDC by 17% and 28% respectively.[235] South Africa remains committed to the peak, plateau and decline GHG emissions trajectory range, with a GHG emissions peak in the period 2020 to 2025, now envisaged with a lower and upper limit of 398 MtCO2e and 510 $MtCO_2e$ respectively. The GHG emissions will plateau in the period 2026 to 2030 with a lower limit of 398 MtCO2e and upper limit of 440 $MtCO_2e$.[236]

The scope and coverage of the UNDC still include the waste sector and three GHGs, namely CO_2, CH_4 and N_2O.[237]

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231 DFFE 2021 http://environment.gov.za/mediarelease/creecy_indc2021draftlaunch_climatechangecop26.

232 In terms of the UNDC "updating" means updating the information in South Africa's NDC, to account for developments that took place during the five years since the NDC was submitted, and "enhancing" means increasing the ambition of the NDC. Refer to para 1 of the UNDC.

233 DFFE 2021 *South Africa First Nationally Determined Contribution 2020/2021 Update* 2.

234 DFFE 2021 *South Africa First Nationally Determined Contribution 2020/2021 Update* 3.

235 DFFE 2021 *South Africa First Nationally Determined Contribution 2020/2021 Update* 15.

236 DFFE 2021 *South Africa First Nationally Determined Contribution 2020/2021 Update* 14.

237 DFFE 2021 *South Africa Nationally Determined Contribution 2020/2021 Update* 18.

3.3.2 National Climate Change Response White Paper

The objectives of the *National Climate Change Response White Paper* are to effectively manage the impacts of climate change and to make a reasonable contribution to stabilise global GHG concentrations in the atmosphere in order to avoid dangerous anthropogenic interference with the climate system.[238] To achieve these objectives, South Africa's climate change response is guided by the following principles:

- **CBDR-RC:** The coordination of national efforts to reduce GHG emissions and adapt to the negative effects of climate change, taking into account the country's unique circumstances, status of development and capacity to take appropriate action.[239] The principle of the CBDR-RC has been discussed earlier in this study and it does not need further discussion.[240]
- **Equity:** Ensure a fair distribution of commitment, funding and benefits in addressing disproportionate vulnerabilities, responsibilities, capabilities, disparities and inequalities.[241] Barnard[242] contends that this principle demands that the current generation, having the right to use and enjoy the resources of the earth, must consider the long-term effect of its actions on the environment. The environment and its resources must be sustained for the use and enjoyment of future generations.
- **Special needs and circumstances and uplifting the poor and vulnerable:** Considering the needs of vulnerable people to the negative impact of climate change, such as the poor, women, children, the aged, the sick and the physically challenged. Policies adopted and measures taken should balance the preservation of human dignity and efforts to achieve environmental, economic and social sustainability.[243]

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238 Paragraph 2 of the *White Paper* 11.
239 Paragraph 3 of the *White Paper* 12.
240 Refer to para 2.3.1.
241 Paragraph 3 of the *White Paper* 12.
242 Barnard 2012 *PELJ* 214.
243 Paragraph 3 of the *White Paper* 12.

- **Intra- and inter-generational sustainability:** The responsible management of environmental, economic and social resources for the benefit of the current and future generations.[244] This principle promotes the sustainable use of natural resources to ensure that the demands of the current generation are met without diminishing the ability of future generations to meet its demands.[245]
- **The Precautionary Principle:** Government needs to be cautious when taking decisions and acknowledge the limits of current knowledge regarding the impacts of decisions and actions.[246] It is premised that if decisions are based on scientific data, harm may be prevented before it occurs and that precautionary measures should in proportion to the potential harm that could be done to the environment.[247] It also acknowledges that specific harm to the climate system can be irreversible, and that possible harm should rather be avoided than risked, as it may not be possible to remedy it later.[248]
- **The Polluter Pays:** The party causing damage to the environment must bear the cost of remedial actions to restore the damage to the environment[249]
- **Informed participation:** Improving public awareness and understanding of the sources and impacts of climate change in order to promote participation and action at all levels.[250] Barnard[251] argues that the notion of public raises three key issues, namely the recognition of the public's human right to participate in government, its ability to constructively submit valuable opinions and ensure access to justice in circumstances where their rights or entitlements have allegedly been violated, and ensuring that aggrieved parties have access to administrative or judicial relief.

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244 Paragraph 3 of the *White Paper* 12.
245 Barnard 2012 *PELJ* 213.
246 Paragraph 3 of the *White Paper* 12.
247 Barnard 2012 *PELJ* 216.
248 Kidd *Environmental Law* 9.
249 Paragraph 3 of the *White Paper* 12.
250 Paragraph 3 of the *White Paper* 12.
251 Barnard 2012 *PELJ* 218.

- **Economic, social and ecological pillars of sustainable development:** The recognition that a sustainable economy relies on a well-functioning ecosystem, and enhancing the sustainability of the economy form integral parts of an effective and efficient climate change response.[252] The rate of use of natural resources must be determined to ensure that current and future generations will benefit from its use and that the management of natural resources must be rational and sustainable.[253]

Climate change resilient development forms the basis of South Africa's climate change approach and includes both climate change mitigation and adaptation strategies. The aim is to contribute to the solution of the global climate change challenge, whilst building its own environmental, social and economic resilience in response to climate change.[254]

The strategic mitigation priorities provided for in the *White Paper* are:

- **Mitigation actions with significant outcomes:** Prioritise effective and efficient mitigation policies to achieve the peak, plateau and decline principle. The goal is for GHG emissions to peak between 2020 and 2025, plateau for approximately 10 years and thereafter decline in absolute terms.[255]
- **Sectoral responses:** All relevant sectors must, in line with the national climate change response objective, monitor, evaluate and report on the implementation of comprehensive climate change response strategies.[256]
- **Policy and regulatory alignment:** Intervention strategies relating to climate change response should be aligned on all three spheres of government.[257]

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252 Paragraph 3 of the *White Paper* 12.
253 Barnard 2012 *PELJ* 212-213.
254 Paragraph 4.1 of the *White Paper* 13.
255 Paragraph 4.2 of the *White Paper* 14.
256 Paragraph 4.2 of the *White Paper* 14.
257 Paragraph 4.2 of the *White Paper* 14.

- **Integrated planning:** Climate change considerations and responses must be included and aligned with all three spheres of government and must specifically be included in the IDPs of municipalities.[258]
- **Resource mobilisation:** The necessary resources to implement climate change responses should be provided.[259]

South Africa's mitigation approach to climate change is based on its international contribution to limit global emissions and to successfully manage the development and poverty eradication[260] challenges it faces.[261] The *White Paper* sets a strategic policy direction in terms of a National GHG Emissions Trajectory Range, projected to 2050. This trajectory range will serve as the baseline against which the effectiveness and efficiency of mitigation efforts will be evaluated.[262] The baseline National GHG Emissions Trajectory Range indicates South Africa's reasonable contribution to the global effort to limit the anthropogenic impact on climate change to below a maximum of 2°C above pre-industrial levels.[263] A peak, plateau and decline trajectory has been adopted to measure mitigation efforts.[264] The National GHG Emissions Trajectory Range is set out in paragraph 3.3.2.1 of this study under the NDC and will therefore not be repeated here.

Each sector emitting significant GHGs is required to develop lower-carbon development and mitigation strategies that should include measurable and verifiable indicators for the strategies concerned.[265] Entities with annual GHG emissions above 0,1 Mt or that consume electricity resulting in emissions of more

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258 Paragraph 4.2 of the *White Paper* 15.
259 Paragraph 4.2 of the *White Paper* 15.
260 Poverty can be defined as "the lack of basic capabilities to live in dignity and rights connected to the principle of poverty eradication should refer to basic human rights., such as the right to health, education, development, food, water, housing and other related rights". See Barnard 2012 *PELJ* 213-214.
261 Paragraph 6.1 of the *White Paper* 25.
262 Paragraph 6.4 of the *White paper* 27-28.
263 Paragraph 6.4.1 of the *White paper* 27.
264 Paragraph 6.4.2 of the *White paper* 27.
265 Paragraph 6.6 of the *White paper* 28-29.

than 0,1Mt from the electricity sector will be compelled to compile a GHG emissions inventory.[266]

The waste sector was identified as a major emitter and the Department of Environment Forestry and Fisheries (DEFF) was tasked to initiate a waste management flagship programme to determine the GHG mitigation potential of the waste sector. The waste management flagship programme should focus on waste-to-energy opportunities with specific reference to the generation, capture, conversion and/or use of CH_4 emissions. The outcomes of the programme will serve as the basis for the development and implementation of a waste-related GHG emission mitigation action plan. Future development and implementation of waste management related policies, legislation and regulations will be guided by the GHG emission mitigation action plan.[267]

The next practical step in South Africa's climate change response was to inscribe the key strategic climate change objectives, governance elements and policies set out in the *Green and White Papers* in law, and therefore South Africa commenced with a public consultation process on the *National Climate Change Bill*.

3.3.3 National Climate Change Bill

Section 2 of the *National Climate Change Bill,* 2018 contains South Africa's vision for an effective climate change response. The objects of South Africa's response to climate change are to:[268]

> (a) provide for the coordinated and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance;
>
> (b) provide for the effective management of inevitable climate change impacts, through enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic, and environmental resilience and an adequate national adaption response in the context of the global climate change response;

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266 Paragraph 6.7 of the *White Paper* 29.
267 Paragraph 8.6 of the *White Paper* 32.
268 *Climate Change Bill* (2018) as published in GN 580 in GG 41689 of 8 June 2018.

(c) Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed in a sustainable manner.

The fundamental principle of the *Climate Change Bill* is to protect the climate system for the benefit of the present and future generations of humankind.[269]

The *Climate Change Bill* must be interpreted and guided by the provisions of the section 2 NEMA principles.[270]

In terms of section 4(2) of the *Climate Change Bill*, the provisions of the final act will be binding on all organs of state, and in terms of the definition of "organ of state" provided in section 239 of the Constitution, this includes the local sphere of government. The *Bill* provides for the establishment of a national environmentally sustainable development framework[271] that will assign and delineate responsibilities pertaining to climate change to the different spheres of government.[272] Every organ of state, therefore including local government, must coordinate and align its policies, plans, programmes and decisions with those of the other spheres of government relating to the execution of its functions and duties to achieve, promote and protect a sustainable environment.[273]

Section 7 of the *Bill* specifically requires local government to align its by-laws and policies to national and provincial laws and policies to give effect to national climate change adaptation and mitigation objectives. The *Bill* also tasks local government to develop and implement a climate change response implementation plan to address climate change needs.[274] The *Bill* further provides that a national greenhouse gas emissions trajectory for the Republic must be set,[275] and that it will

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269 Section 3(b) of the *Climate Change Bill.*
270 Section 3((a) of the *Climate Change Bill.*
271 Section 6(1) of the *Climate Change Bill.*
272 Section 6(2) of the *Climate Change Bill*.
273 Section 7 of the *Climate Change Bill.*
274 Section 9 of the *Climate Change Bill*.
275 Section 11(1) of the *Climate Change Bill.*

bind all organs of state in all spheres of government.[276] Furthermore, local government must set sector-specific targets for GHG emissions,[277] which targets are to be included in its planning cycles.[278] The implementation of and compliance with them must be constantly monitored and reported to the Presidency to ensure the implementation of the national climate change response throughout all spheres of government.[279] As indicated earlier in this dissertation,[280] methane, which is a GHG, is produced at landfill sites, and it goes without saying that provisions relating to waste facilities will form part of the scope and application of the *Climate Change Bill* to be adhered to by local government.

3.3.4 National Environmental Management Act 107 of 1998[281]

The *National Environmental Act* 107 of 1998 (NEMA) is South Africa's principle environmental framework law that sets out the general principles and obligations guiding all activities that affect the environment. [282] The NEMA gives effect to the principles of section 24 of the Constitution and *inter alia* serves as the general framework for the formulation of environmental management and implementation plans.[283] Organs of state must take cognisance of the provisions of NEMA in exercising any function and taking any decision relating to the protection of the environment.[284]

The NEMA defines the environment as follows:[285]

> …the surroundings within which humans exist and that are made up of-
> (i) The land, water and atmosphere of the earth;
> (ii) Micro-organisms, plant and animal life;

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276 Section 11(2) of the *Climate Change Bill.*
277 Section 12(1) of the *Climate Change Bill.*
278 Section 12(6) of the *Climate Change Bill.*
279 Section 12(7) of the *Climate Change Bill*.
280 Refer to para 1.4.
281 *National Environmental Management Act* 107 of 1998.
282 Du Plessis and Kotzé 2014 *JAL* 159.
283 Section 2(1)(b) of the NEMA.
284 Section 2(1)(c) of the NEMA.
285 Section 1(1) of the NEMA.

(iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and

(iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Section 2 of the NEMA sets out principles relating to environmental management applicable to the actions of all organs of state throughout the Republic, including local government, when such actions may significantly affect the environment.[286] A fundamental principle of the NEMA is the State's responsibility to respect, protect, promote and fulfil its environmental responsibilities as contained in section 24 of the Bill of Rights.[287] The NEMA serves as the framework legislation within which government is to exercise its powers, functions and duties concerning the protection of the environment.[288] Section 4 of the NEMA provides for sustainable development and climate change mitigation measures. Any disturbance of the ecosystem or loss of biological diversity should be avoided or minimised,[289] pollution and degradation of the environment should be avoided or minimised,[290] waste must be avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible, and otherwise disposed of in a responsible manner.[291] Waste management is one of the core functions of local government that will be discussed further in this study.

The NEMA provides that national and provincial departments should prepare environmental management plans (EMPs) and environmental implementation plans (EIPs)[292] to co-ordinate the environmental policies, plans and programmes of the various spheres of government, including the local sphere of government, to ensure a sustainable environment.[293]

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286 Section 2(1) of the NEMA.
287 Section 2(1)(a) of the NEMA.
288 Sections 2(1)b) to (e) of the NEMA.
289 Section 2(4)(a)(i) of the NEMA.
290 Section 2(4)(a)(ii) of the NEMA.
291 Section 2(4)(a)(iv) of the NEMA.
292 Section 11 of the NEMA.
293 Section 12 of the NEMA.

Chapter 5 of the NEMA deals with integrated environmental management (IEM) to promote the use of environmental management tools, such as environmental impact assessments. The aim of an environmental impact assessment is to identify, predict and evaluate the potential and actual impact of activities on the environment and socio-economic conditions of an area. Furthermore, it should address the mitigation of activities to minimise its negative impact on the environment.[294] The different spheres of government, as the competent authorities, must in considering environmental authorisations consider, investigate and assess the potential consequences of or impacts on the environment relating to the activity contemplated in the application. Section 24(O) of NEMA sets out criteria that must be taken into account when considering applications. Three of the criteria to be taken into account that allude to the inclusion of climate change mitigation considerations are set out in section 24(O)(1)(a)(i) to (iii). They are:

> (i) any pollution, environmental impacts or environmental degradation likely to be caused if the application is approved or refused;
> (ii) measures that may be taken-
>
> (aa) to protect the environment from harm as a result of the activity which is subjected to the application; and
>
> (bb) to prevent, control, abate or mitigate any pollution, substantially detrimental environmental impacts or environmental degradation.
>
> (iii) the ability of the applicant to implement mitigation measures and to comply with any conditions subject to which the application may be granted.

Van der Bank[295] contends that it is important for an EIA to include climate change assessments to address the impact of climate change and to promote the reaching of climate change targets. As things stand, many planners fail to address the impact of climate change in project and development planning.

In the *EarthLife Africa Johannesburg v Minister of Environmental Affairs and Others* case the High Court found that section 240(O)(1) of the NEMA confirms that the impacts of climate change are relevant factors that must be considered in

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294 Sections 23(1) and (2) of the NEMA.
295 Van der Bank and Karsten 2020 *Air, Soil and Water Research* 11.

development applications. When considering environmental impacts, environmental degradation or any pollution one should logically also consider the impact on climate change.[296] The High Court also concluded that:

> … the legislative and policy scheme and framework overwhelmingly support the conclusion that an assessment of climate change impacts and mitigating measures will be relevant factors in the environmental authorisation process, and that consideration of such will best be accomplished by means of a professional researched climate change impact report.[297]

Van der Bank[298] is of the opinion that the implication of the judgment in the *EarthLife* case is that a climate impact assessment must be done for all projects with a significant climate change impact. The judgment confirms the duty of government to exercise its duties and responsibilities within the legislative framework of the Constitution and the NEMA and to give consideration to environmental laws and regulations when doing so.[299]

3.3.5 National Environmental Management: Waste Act 59 of 2009[300]

The *National Environmental Management: Waste Act* 59 of 2009 (hereinafter referred to NEM:WA) is framework legislation relative to the NEMA, regulating waste management activities. South Africa has no specific law regulating climate change but has a number of policies, generic laws and specific environmental management acts (SEMAs) enacted under the NEMA. [301] Provisions relevant to climate change are contained in the SEMAs. The NEM:WA is one of the SEMAs enacted under NEMA.[302] The NEW:WA must therefore be read with and be guided by the national environmental management principles as provided for in section 2

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296 *EarthLife Africa Johannesburg v Minister of Environmental Affairs and Others* 2017 2 All SA 519 (GP) para 78.
297 *EarthLife Africa Johannesburg v Minister of Environmental Affairs and Others* 2017 2 All SA 519 (GP) para 91.
298 Van der Bank and Karsten 2020 *Air, Soil and Water Research* 18-19.
299 Section 24 of the Constitution and s 24 of NEMA should specifically be considered.
300 *National Environmental Management: Waste Act* 59 of 2008.
301 Du Plessis and Kotzé 2014 *JAL* 162.
302 Baloyi (ed) *Waste Act Made Easy* 8.

of the NEMA when applying and interpreting it.[303] The principles referred to include avoiding the degradation of the environment and pollution, where possible, and where they cannot be avoided, the impact thereof should be minimised. The NEM:WA obligates all organs of state responsible for waste management (which includes local government as an organ of state) to implement uniform measures to reduce the amount of waste generated and, where waste is generated, to re-used, recycle and recover the waste in an environmentally acceptable manner. As a last option, waste should be safely treated and disposed of.[304] The local solid waste sector could contribute to the mitigation of GHG emissions *inter alia* through the use of waste-to-energy and mechanical biological treatment systems. [305]

The NEM:WA defines "waste" as "any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered".[306]

Any waste or portion of waste mentioned above ceases to be waste once it is or has been re-used, recycled or recovered.[307] This dissertation focusses on "general waste" as defined in the NEM:WA[308] as "waste that does not pose an immediate hazard or threat to health or to the environment, and includes-

(a) domestic waste;

(b) building and demolition waste;

(c) business waste;

(d) inert waste; or

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303 Section 5 of the NEM:WA.
304 Section 3 of the NEM:WA.
305 Du Plessis and Kotzé 2014 *JAL* 166. For more detailed information on waste-to-energy systems, refer to ASSAf 2011 *Towards a Low Carbon City: Focus on Durban* 111-112.
306 Section 1 of the NEM:WA.
307 Section 1 of the NEMWA.
308 Schedule 3 of the NEM:WA: Defined Wastes Category B: General Waste.

(e) any waste classified as non-hazardous waste in terms of the regulations made under section 69,

and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes."

The NEM:WA further aims to protect health, well-being and the environment by providing reasonable measures for:[309]

- minimising the consumption of natural resources;
- avoiding and minimising the generating of waste;
- reducing, re-using, recycling and recovering waste;
- treating and safely disposing of waste as a last resort;
- preventing pollution and ecological degradation;
- securing ecologically sustainable development while promoting justifiable economic and social development; promoting and ensuring the effective delivery of waste services;
- remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and
- achieving integrated waste management reporting and planning.

The NEM:WA mandates municipalities to adopt integrated waste management plans[310] (IWMPs) to provide for the implementation of waste minimisation, re-use, recycle and recovery targets and initiatives.[311] Municipalities should also implement South Africa's obligations contained in relevant international agreements.[312] The IWMPs of a municipality must also be included in its IDP as provided for in Chapter 5 of the *Municipal Systems Act*.[313] A report on the implementation of its IWMP must be included in its annual performance report as provided for in terms of section 46 of the *Municipal Systems Act*.[314] In finalising its IWMP, a municipality must embark

309 Section 2(a) of the NEM:WA.
310 Section 4(a) of the NEM:WA.
311 Section 12(1)(b)(iv) of the NEM:WA.
312 Section 12(1)(b)(vi) of the NEM:WA.
313 Section 4(a)(ii) of the NEM:WA.
314 Section 13(4) of the NEM:WA.

on a public participation process, inviting comments and inputs on the plan from the public.[315]

The NEM:WA imposes on municipalities the responsibility to deliver waste management services, which includes waste removal, waste storage and waste disposal services, within the parameters of the national and provincial norms and standards.[316] In exercising its mandate relating to waste management services a municipality must include waste collection, waste storage and waste disposal services in its integrated development plan (IDP).[317] The NEM:WA also authorises a municipality to set local norms and standards relating to waste services in order to regulate its waste disposal facilities,[318] to avoid and minimise the generation of waste, the re-use, recycling and recovery of solid waste[319] and the direction of waste to specific waste treatment and disposal facilities.[320] A municipality may give effect to its executive authority by promulgating by-laws to regulate waste services.[321]

The Minister for Environment Forestry and Fisheries may set national norms and standards for planning for the provision of waste management services to ensure uniformity throughout the Republic.[322] These norms and standards will provide a guiding framework for municipalities on how to exercise their powers and duties relating to waste services, such as the storage, collection, transportation, separation, treatment and disposal of waste.[323]

In terms of section 69 of the NEM:WA, the Minister for Environment Forestry and Fisheries may promulgate regulations *inter alia* regarding the following matters:

- the identification and categorisation of waste;

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315 Section 73 of the NEM:WA.
316 Section 9(1) of the NEM:WA.
317 Section 9(2)(b) of the NEM:WA.
318 Section 9(3)(a) of the NEM:WA.
319 Section 9(3)(b) of the NEM:WA.
320 Section 9(3)(c) of the NEM:WA.
321 Section 9(3) to (5) of the NEM:WA.
322 Section 7 of the NEM:WA.
323 Baloyi (ed) *Waste Act Made Easy* 19.

- the manner in which particular waste types must be dealt with and managed;
- requirements for monitoring compliance with the act;
- waste management planning;
- measures that are required for the environmentally sound management of waste;
- requirements in respect of waste management activities;
- the utilisation of waste by recovery, re-use and re-cycling;
- the reduction of waste;
- the control over waste management facilities;
- the location, planning and design of waste management activities; and
- measures that must be taken in respect of the implementation of waste minimisation, including the separation of waste at the point of generation and the setting of targets or percentages of products that must be recovered under a re-use, recycling, refundable or take-back programme.

The Minister of Environment, Forestry and Fisheries *inter alia* promulgated the following regulations relating to municipal waste management:

- *National Domestic Waste Collection Standards*, 2011;[324]
- *Municipal Waste Sector Plan*, 2012;[325]
- *National Waste Management Strategy*, 2012;[326]
- *National Waste Information Regulations*, 2012;[327]
- *Waste Classification and Management Regulations*, 2013;[328]
- *National Norms and Standards for the Assessment of Waste for Landfill Disposal*, 2013;[329]
- *National Norms and Standards for Waste Disposal of Waste to Landfill*, 2013;[330]

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324 *National Domestic Waste Collection Standards* 2011, GNR 777 in GG 32439 of 24 July 2009.
325 *Municipal Waste Sector Plan* 2012, GNR 270 in GG 33935 of 21 January 2011.
326 *National Waste Management Strategy,* 2012, GNR 344 in GG 35206 of 30 March 2012.
327 *National Waste Information Regulations*, 2012, GNR 625 in GG 35306 of 4 May 2012.
328 *Waste Classification and Management Regulations* 2013, GNR 634 in GG 36784 of 23 August 2013.
329 *National Norms and Standards for the Assessment of Waste for Landfill Disposal*, 2013, GNR 635 in GG 36784 of 23 August 2013.
330 *National Norms and Standards for Disposal of Waste to Landfill*, 2013, GNR 636 in GG 36784 of 23 August 2013.

- *List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment*, 2013;[331]
- *National Norms and Standards for the Storage of Waste*, 2013.[332]

3.3.5.1 National Domestic Waste Collection Standards, 2011

The National Domestic Waste Collection Standards (NDWCS) aims to set a uniform framework for the collection of domestic waste in South Africa in order redress the imbalances of the past relating to the provision of waste services. The NDWCS provides guidelines for municipalities for the provision of acceptable, affordable and sustainable waste collection services conducive to the preservation of human health and the environment.[333]

The NDWCS provides for the following requirements relating to recycling:

- Separation at source should be promoted in accordance with industry waste management plans and all household waste in cities should be separated at source;[334]
- Municipalities and service providers should give clear guidelines on sorting waste. Appropriate removal schedules and waste containers must be provided;[335]

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331 *List of Waste Management Activities that have, or likely to have, a detrimental effect on the environment*, 2013, GN 921 in GG 37083 of 29 November 2013.

332 *National Norms and Standards for the Storage of Waste*, 2013, GN 926 in GG 37088 of 29 November 2013. However, the eight goals or targets set in the 2011 NWMS were replaced by the three outcomes of the 2020 NWMS, which are a consolidation of the eight goals. Refer to page 39 Key interventions and expected outcomes of the NWMS 2020. "The eight goals of the 2011 NWMS were: promote waste minimisation, re-use, recycling and recovery of waste; ensure the effective and efficient delivery of waste services; grow the contribution of the waste sector to the green economy; ensure that people are aware of the impact of waste on their health, well-being and the environment; achieve integrated waste management planning; ensure sound budgeting and financial management for waste services; provide measures to remediate contaminated land; and establish effective compliance with the enforcement of the Waste Act."

333 Section 1 of the NDWCS.

334 Section 4.1(a) of the NDWCS.

335 Section 4.1(b) of the NDWCS.

- The involvement of the community in recycling must be encouraged;[336]
- Municipalities should facilitate the recycling of household recyclable domestic waste, by providing drop-off centres and kerbside collection;[337]
- Non-mainstream recyclable materials such as e-waste, batteries, etc. should be diverted to drop-off centres;[338]
- Recyclable waste must be removed from drop-off centres a least every two weeks;[339]
- A designated Waste Management Officer should be identified to handle general communications and awareness raising relating to waste.[340]

3.3.5.2 Waste Classification and Management Regulations, 2013

The purpose of the Waste Classification and Management Regulations (WC&MR) is to classify and manage waste in line with the provisions of the Waste Act;[341] to establish mechanisms and procedures to list waste management activities not requiring a waste management licence;[342] to set requirements for the disposal of waste to landfill[343] and the timeframes for the management of certain wastes,[344] and to set out the responsibilities of waste generators, transporters and managers.[345]

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336 Section 4.1(c) of the NDWCS.
337 Section 4.2(a) of the NDWCS.
338 Section 4.2(b) of the NDWCS.
339 Section 4.6 of the NDWCS.
340 Section 8.1 of the NDWCS.
341 Section 2(1)(a) of the WC&MR.
342 Section 2(1)(b) of the WC&MR.
343 Section 2(1)(c) of the WC&MR.
344 Section 2(1)(d) of the WC&MR.
345 Section 2(1)(e) of the WC&MR.

3.3.5.3 National Norms and Standards for Disposal of Waste to Landfill, 2013

The purpose of the norms and standards is to set requirements for the disposal of waste to landfill as provided for in the Waste Classification and Management Regulations.[346]

The landfill disposal requirements as per waste type are provided in Table 2.

Table 2: Landfill disposal requirements as per waste type[347]

Waste Type	Landfill Disposal Requirements
Type 0	The disposal of Type 0 waste to landfill is not allowed. The waste must be treated and re-assessed in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal.
Type 1	Type 1 waste may be disposed of only at a Class A landfill designed in accordance with section 3(1) and (2) of these Norms and Standards or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a Hh/HH landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd ed, Department of Water Affairs and Forestry, 1998).
Type 2	Type 2 waste may be disposed of only at a Class B landfill designed in accordance with section 3(1) and (2) of these Norms and Standards or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd ed, DWAF, 1998).
Type 3	Type 3 waste may be disposed of only at a Class C landfill designed in accordance with section 3(1) and (2) of these Norms and Standards or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd ed, DWAF, 1998).
Type 4	Type 4 waste may be disposed of only at a Class D landfill designed in accordance with section 3(1) and (2) of these Norms and Standards or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB- landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd ed, DWAF, 1998).

346 Section 2 of the National Norms and Standards for Disposal of Waste to Landfill.
347 Section4(1) of the *National Norms and Standards for Disposal of Waste to Landfill*.

Table 3 indicates the manner in which waste destined for disposal to landfill, in terms of the regulations, must be disposed of.

Table 3: Landfill disposal requirements per listed waste[348]

Listed Waste	Landfill Disposal Requirements
Domestic waste; business waste not containing hazardous waste or hazardous chemicals; non-infectious animal carcasses and garden waste	Disposal allowed only at a Class B landfill designed in accordance with section 3(1) and (2) of these Norms and Standards or, subject to section 3(4) of these Norm and Standards, at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd ed, DWAF, 1998).
Post-consumer packaging and waste tyres	Disposal allowed only at a Class C landfill designed in accordance with section 3(1) and (2) of these Norms and Standards or, subject to section 3(4) of these Norms and Standards, at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd ed, DWAF, 1998).
Building and demolition waste not containing hazardous waste or hazardous chemicals and excavated earth material not containing hazardous waste or hazardous chemicals	Disposal allowed at a Class D landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, at a landfill site designed in accordance with the requirements for a GLB- landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd ed, DWAF, 1998).

3.3.5.4 National Waste Information Regulations, 2012

The purpose of the National Waste Information Regulations (NWIR) is the regulation and collection of information and data to reach the objectives of the national waste information system in terms of section 62 of the Waste Act.[349] The regulations are applicable to everyone who conducts an Annexure 1 listed activity

[348] Section 4(2) of the *National Norms and Standards for Disposal of Waste to Landfill*.
[349] Section 2 of the NWIR.

of the regulations[350] and there is an obligation on persons conducting such activities to submit the relevant information to the provincial waste information system.[351]

3.3.5.5 National Norms and Standards for the Assessment of waste for landfill disposal, 2013

These Norms and Standards prescribe the requirements for the assessment of waste prior to disposal to landfill.[352] The regulations set the Standard Assessment Methodology to access waste for disposal to landfill, such as:[353]

- The identification of chemical substances present in waste;[354]
- Sampling and analysis to determine the total concentration and leachable concentrations of the elements and chemical substances that have been identified in the waste.[355]

3.3.5.6 National Norms and Standards for the Storage of Waste, 2013

The purpose of these norms and standards is to standardise the management of waste storage facilities,[356] in terms of industry best practices[357] and to set minimum standards for the design and operation of existing and new waste storage facilities.[358]

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350 Section 3(1) of the NWIR.
351 Section 3(2) of the NWIR.
352 Section 2 of the *National Norms and Standards for the Assessment of Waste for Landfill Disposal*.
353 Section 3(1) of the *National Norms and Standards for the Assessment of Waste for Landfill Disposal*.
354 Section 3(1)(a) of the *National Norms and Standards for the Assessment of Waste for Landfill Disposal*.
355 Section 3(1)(b) of the *National Norms and Standards for the Assessment of Waste for Landfill Disposal*.
356 Section 2(1)(a) of the *National Norms and Standards for the Storage of Waste*.
357 Section 2(1)(b) of the *National Norms and Standards for the Storage of Waste*.
358 Section 2(1)(c) of the *National Norms and Standards for the Storage of Waste*.

3.3.6 National Waste Management Strategy (2020)[359]

The NEM:WA empowers the Minister of Environment Forestry and Fisheries to develop and establish a *National Waste Management Strategy* (NWMS) to achieve the objects of the NEM:WA in setting priorities, guidelines and procedures to protect the environment and to manage the generation, re-use, recycling, recovery, treatment and disposal of waste.[360] Targets may be set in the NWMS for waste reduction, for example setting tons or percentage of waste that should be recycled or different waste streams that should be targeted for recycling.[361]

The ultimate goal of the NWMS is to provide a framework and strategy for the implementation of the NEM:WA. It sets out government's policy and strategic interventions pertaining to waste management.[362]

The objects of the NEM:WA are based on the waste management hierarchy. The NWMS follows the same principles, as set out in Table 4.

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359 *National Waste Management Strategy*, 2020.
360 Section 6(1) of the NWMS.
361 Section 6(2) of the NWMS and Baloyi (ed) *Waste Act Made Easy* 18.
362 *National Waste Management Strategy*, 2020 9 para 1.

Table 4: NWMS waste management hierarchy principles[363]

Principle	Explanation
Waste Minimisation	This refers to avoiding the amount and toxicity of waste that is generated and, in the event that waste is generated, the reduction of the amount and toxicity of the waste that is disposed of.
Waste Prevention	This refers to avoiding the generation of waste and avoiding toxicity in waste.
Waste as a Resource	This refers to the beneficiating of waste through re-use, recycling, treatment and recovery to reduce the amount and the toxicity of the waste disposed of.
Sustainable Strategic Partnerships	This refers to government's establishing and sustaining collaborative working relationships with non-governmental role-players involved in the management of waste, i.e. the private sector, academia, civil society organisations and other development funding institutions.
Environmentally Sound Socio-economic Growth and Development	This refers to ensuring that the intent and commitments of the Sustainable Development Goals (SDGs) and the National Development Plan (NDP) are continuously integrated and aligned with all environmental protection considerations, and that environmental protection programmes contribute to improving the socio-economic lives of people.

The NWMS is based on three outcomes supported by three strategic pillars with key intervention actions assisting in the monitoring and evaluation of its implementation. Collectively it will give effect to the international and national waste management and reduction efforts.[364] The three pillars, three outcomes and key intervention actions of the NWMS are summarised in Table 5.

363 *National Waste Management Strategy*, 2020 22-23 para 3.3.

364 DEFF *Budget Policy Statement* 2019/2020, Minister Babara Creecy, July 2019. Refer to NWMS 2020 9.

Table 5: NWMS pillars, outcomes and key interventions[365]

Strategic pillar	Outcome	Key interventions
Waste Minimisation	40% of waste diverted from landfill in 5 years; 55% in 10 years; and at least 70% in 15 years leading to zero waste going to landfill.	• Prevent waste generation through cleaner production, industrial symbiosis and extended producer responsibility; • Prevent food waste; • Increase re-use, re-cycling and recovery rates; • Divert organic waste from landfill through composting and the recovery of energy; • Divert construction and demolition waste from landfill through beneficiation; and • Increase technical capacity and innovation for the beneficiation of waste.
Effective and Sustainable Services	All South Africans live in clean communities with waste services that are well managed and financially sustainable	• Separate waste at source; • Safe and environmentally sustainable disposal of hazardous household waste; • Implementation of the Cities Support Programme; and • Effective integrated waste management planning.
Compliance, Enforcement and Awareness	Mainstreaming of waste awareness and a culture of compliance resulting in zero tolerance of pollution, litter and illegal dumping	• Reduce pollution, littering and illegal dumping; • Enhance capacity to monitor compliance and enforce the Waste Act and international agreements; and • Ensure municipal landfill sites and waste management facilities comply with licensing requirements.

A municipality must adhere to the NWMS when performing a function or duty in terms of the NEM:WA or any other waste management legislation.[366] As the organs of state mandated with delivering the function of waste management, metropolitan, district and local municipalities must give effect to the NWMS through the planning and delivery of waste collection and disposal services and the provision of infrastructure.[367] Under paragraph 10.3.2 it is envisaged that the NWMS will assist municipalities with guidelines to interpret, apply and implement both the NEM:WA and the NWMS 2020 in their IWMPs and IDPs.[368]

Alberts[369] describes the following tools available to local government to effectively execute its waste management functions and duties:

- Waste classification and management systems: Classifies waste and determines the evaluation and disposal of waste for landfill sites.
- Norms and standards: Determines benchmark regulatory standards for waste management for each phase of the waste management hierarchy.
- Licensing of activities: Determines specific conditions to regulate waste management activities that have the potential to negatively impact the environment.
- Waste management planning: To comply and implement the NEM:WA, an integrated municipal waste management plan must be compiled.
- Economic instruments: Incentives to promote certain practices and disincentives to discourage other practices.

365 National Waste Management Strategy 2020 40.
366 Section 6(4) of the NEM:WA.
367 *National Waste Management Strategy*, 2020 53 para 9.3.
368 *National Waste Management Strategy*, 2020 58.
369 Alberts "Solid Waste Management" 418-422.

3.3.6.1 Waste Management Hierarchy

Observing the waste management hierarchy is a generally accepted principle in guiding the development of waste management policies in different practical ways. It is considered that municipal solid waste should be managed to mitigate the negative impact on the environment and human health. The implementation of the waste management hierarchy also contributes to the development of sustainable and zero-based societies, taking the principles of a circular economy into account.[370] A circular economy closes the gap in the lifecycle circle between resource extraction and waste disposal by applying the principles of the waste management hierarchy, namely waste avoidance, re-use, repair, recycling and recovery to minimise the generation of waste and reduce the demand for virgin materials to produce goods.[371] Van Ewijk and Stegemann[372] contend that the waste hierarchy is commonly referred to as a priority order for waste management options based on assumed environmental impacts. Alberts[373] contends that the avoidance and reduction of waste requiring disposal is the foundation of the waste hierarchy.[374] Alberts further contends that a reduction in the production of waste may also reduce the amount of GHGs being emitted from landfill sites, being the biggest contributor of GHG in the waste sector.

The waste management hierarchy sets out alternatives for waste management in order of preference during the lifecycle of waste.

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370 Ferrari, Gamberini and Rimini 2016 *Int J Sus Dev Plann* 761.
371 *National Waste Management Strategy*, 2020 25 para 4.2.
372 Van Ewijk and Stegemann 2016 *Journal of Cleaner Production* 123.
373 Alberts "Waste Management in South Africa" 19-12.
374 Alberts "Waste Management in South Africa" 19-12.

Figure 2 illustrates the waste management hierarchy as envisaged by the DEFF in the NWMS 2020:

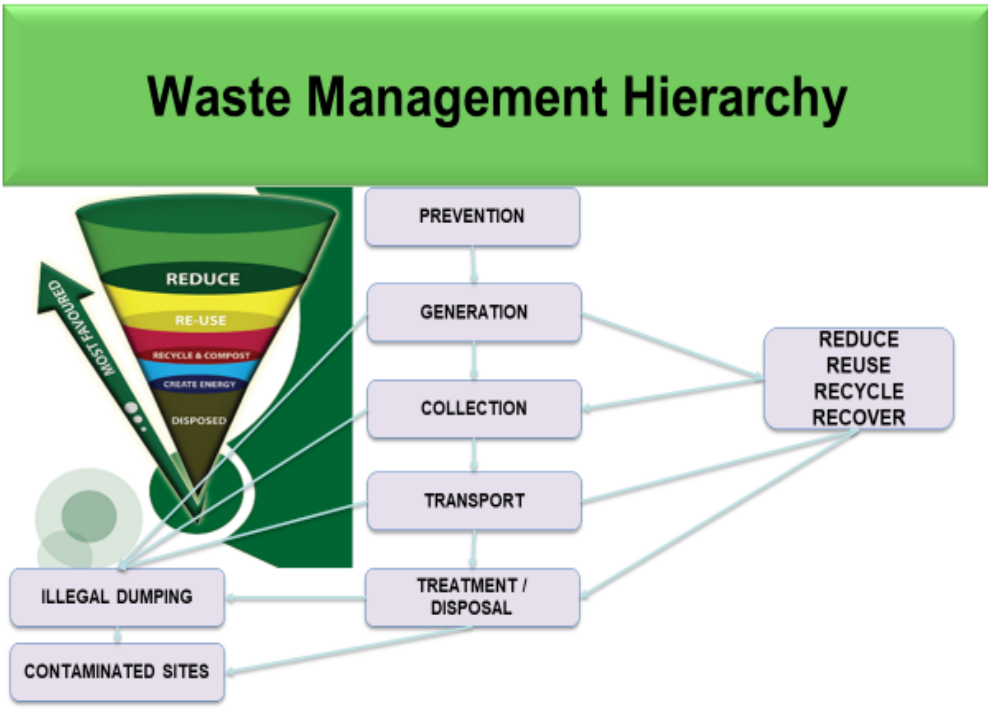

Figure 2: Waste management hierarchy[375]

The first choice in waste management is avoidance and reduction, followed by re-using and then recycling. These first stages form the foundation of waste management as it aims to re-use or re-cycle a product and not deposit it at a landfill site. The products therefore become inputs for new products.

Recovery is the reclaiming of components of products or materials or utilising the waste as a fuel. If there is no other option available, waste gets treated and/or disposed of, taking the safest method for its final disposal into account. Ackerman[376] submits that waste management has various impacts on climate change, ranging from the reduction in energy use as a result of recycling, energy recovery from waste, carbon sequestration in forests flowing from the decreased demand for

375 *National Waste Management Strategy*, 2020 28.
376 Ackerman 2000 *IJJS* 223.

virgin paper, to landfill methane emissions and energy used in transporting waste. Ackerman[377] contends that efficient waste management could contribute a 1% to 6% reduction in national GHG emissions. The abovementioned principles, waste prevention and waste as a resource, are also echoed in the NWMS and are identified as the foundation for waste minimisation and the facilitation of a circular economy.[378] The primary objective of the NEM:WA is to apply the principles of the waste management hierarchy,[379] which will result in a reduction of waste requiring disposal and will result in the reduction of the quantity of the GHGs emitted from landfills, which are among the major contributors to GHG emission in the waste sector.[380]

Municipalities are among the major role-players in implementing the waste management hierarchy, as they implement and promote the principles of the hierarchy of the re-use, recycling or recovery of waste materials. They should implement the practices of sorting general recyclable waste materials, establish recycling infrastructures, recyclable waste collection systems, material recovery facilities and buy-back centres.[381]

The Norms and Standards for Disposal of Waste to Landfill obliges municipalities to divert certain waste streams from landfill in set periods.[382] Recyclable waste and organic waste will then be diverted from landfill sites, alleviating the burden on such sites. Organic waste at landfill sites is identified as one of the biggest contributors to GHGs emanating from landfill sites and therefore a reduction in organic waste should result in a decline in GHG emissions from landfill sites.[383] Kotzé[384] is of the opinion that the IWMP of the municipality is the main tool in terms of planning for the effective implementation of the waste management hierarchy, as the IWMP

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377 Ackerman 2000 *IJJS* 228-229.
378 *National Waste Management Strategy*, 2020 26.
379 Section 16 of the NEM:WA.
380 Kotzé *et al* "Climate Change Law and Governance" 19-12.
381 Kotzé *et al* "Climate Change Law and Governance" 19-13.
382 *National Norms and Standards for the Storage of Waste*, 2013, GN 926 in GG 37088 of 29 November 2013.
383 Kotzé *et al* "Climate Change Law and Governance" 13-14.
384 Kotzé *et al* "Climate Change Law and Governance" 19-17.

must contain an implementation plan for the waste management hierarchy, targets and initiatives set out in the NEM:WA and the NWMS, as well as best practices in relating to waste management. Section 12 of the NEM:WA stipulates the content of an IWMP, which should specifically provide for the municipality's waste management objectives and priorities,[385] set targets for the collection, minimisation, re-use and recycling of waste,[386] plan for new disposal facilities and the decommissioning of redundant waste disposal facilities,[387] and identify the funding resources to implement the IWMP.[388]

3.4 Conclusion

A brief overview of the South African environmental law and climate change legal landscape has been provided in this chapter with the aim of determining the national and provincial mandates for local government relating to climate change and waste management. It was indicated that section 24 of the Constitution serves as the environmental right that gives individuals an essential human right and the right to the protection against harm of their health and well-being. As a co-responsible organ of state, local government must adhere to the provisions of section 24 and protect the environment. The Constitution also entrusts the function of waste management to local government in terms of part B of schedules 4 and 5 of the Constitution. Local government is authorised to exercise its executive authority in performing its functions by promulgating by-laws.

The chapter points out that South Africa has developed the *National Climate Change Green Paper, the National Climate Change White Paper* and the *National Climate Change Bill* in response to its responsibility to curb the occurrence and impact of climate change. The *Green* and *White Papers* represent South Africa's vision in dealing with climate change, to reach climate change resilient development and a low-carbon economy, by setting mitigation objectives, strategies and interventions

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385 Section 12(1)(d) of the NEM:WA.
386 Section 12(1)(c) of the NEM:WA.
387 Section 12(1)(f) of the NEM:WA.
388 Section 12(1)(g) of the NEM:WA.

for specific areas, including the waste sector. In its NDC South Africa commits to substantial global GHG emission reduction to keep the global temperature rise well below 2^{o}C, and submits a peak, plateau and decline trajectory that will contribute to limiting the growth of emissions, addressing poverty and being consistent to the transition to a low carbon future. The NDC was also updated and enhanced to reflect the progression made during the last five years and to set more ambitious targets for GHG emission reductions. The *Bill* is important as it tasks local government with developing and implementing a climate change response plan. Local Government must set sector-specific targets for GHG emissions. It has been indicated in the chapter that Parliament promulgated the NEMA to give effect to section 24 of the Constitution and make all spheres of government responsible for respecting, protect, promoting and fulfilling the state's environmental duties. The NEMA places the responsibility on local government to compile an IEMP and to determines climate change impacts as relevant factors that must be considered in development applications.

Following the discussion of the NEMA, the NEM:WA was investigated as one of the SEMAs of the NEMA relating to waste management. The NEM:WA places an obligation on local government to put in place measures to reduce the amount of waste generated and to re-use waste where possible. The NEM:WA obliges municipalities to deliver waste management services and to include such measures in its IDP. The NEM:WA requires that the Minister develop a NWMS to achieve its objects, and the chapter provides a broad overview of the NWMS.

The NWMS provides a framework and strategy for the implementation of the principles of waste prevention, waste minimisation, waste as a resource and sustainable environmental development. The NEM:WA and the NWMS base their objects and principles on the principles of the waste management hierarchy, and the waste management hierarchy was therefore briefly discussed. The waste management hierarchy sets out the priorities of waste management, including avoidance, reduction, re-use, re-cycling, recovery, and as a last resort disposition

at a landfill site, to achieve a reduction in waste material to aleviate the impact on the environment.

In summary, the Constitution and the relevant national and provincial legislation, policies and plans provide the mandate for local government to exercise its functions and duties relating to waste management and climate change mitigation.

Chapter 4: The Local Government Legal Landscape

4.1 Introduction

As indicated in the previous chapter local government has a constitutional mandate to provide services to communities in a sustainable manner, to promote a safe and healthy environment and to comply with the provisions of national legislation and strategies. The constitutional mandate relates directly and indirectly to the powers and functions of climate change and waste management.[389] The aim of this chapter is to elucidate the various pieces of legislation composing the regulatory legal landscape that local government needs to comply with, focussing specifically on waste management and the mitigation of its impact on the climate. The chapter further aims to explain the various tools local government is obliged to utilise for the effective and efficient governance, implementation, monitoring and evaluation of its environmental mandated functions. The environmental mandated functions include waste management and reducing the impact of climate change. Nel and Du Plessis[390] define environmental governance as:

> The collection of legislative, executive and administrative functions, processes and instruments used by any organ of state to ensure sustainable behaviour by all as far as governance of activities, products, services, processes and tools is concerned.

Nel, Du Plessis and Du Plessis[391] contend that the effective and efficient implementation of local environmental governance (LEG) depends on the use of several tools on a management and governance level to implement, monitor, evaluate and report on the rendering of environmental services. These tools are used by the executive, legislative and administrative components of a municipality to achieve specific outcomes relating to service delivery,[392] and their implementation should be part of the legal compliance management portfolio of a

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389 Refer to para 3.2.
390 Nel and Du Plessis 2004 *SAPL* 183.
391 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 91.
392 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 92.

municipality. A brief overview of these tools will be dealt with in the introduction to give a fair understanding thereof.[393]

This chapter begins by focussing on Chapter 7 of the Constitution, which sets the scene for the establishment of local government as a separate sphere of government and provides for the objects of local government. It indicates that in terms of the Constitution national government is authorised to promulgate legislation relating to the establishment of municipalities and to determine their functions and duties. Flowing from the discussion of the Constitution, the most pertinent legislation governing local government, relating to its structures, functions and duties and implementation, monitoring and evaluation tools are discussed. Firstly, the *Municipal Structures Act* is addressed to determine the different types of municipalities and their respective functions and duties. An overview of the structures to be established as LEG tools, providing oversight over service delivery is highlighted. The focus is then shifted to a discussion of the *Municipal Systems Act,* which vests the executive and legislative authority of the municipality in its council with the mandate to develop policies, IDPs, strategies and programmes, including setting targets for service delivery and passing by-laws to execute its functions and duties as well as to monitor and evaluate the effective and efficient rendering of municipal services through a performance management system (PMS). A comprehensive discussion of the IDP as an LEG tool is followed by the discussion of other LEG tools such as the performance audit committee and community participation to perform an oversight function. Finally, the *Municipal Finance Management Act* (hereinafter referred to as MFMA) is discussed to highlight the necessity for the compilation of a service delivery and budget implementation plan (hereinafter referred to as SDBIP) as an LEG tool for the implementation of the municipality's delivery of services and its annual budget. An overview of the internal audit unit and audit committee as LEG tools of the MFMA is given. In the next

393 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 94.

chapter, a desk-top case study is conducted on a municipality to investigate the practical implementation of the regulatory legal framework and LEG tools.

4.2 Classification of local environmental governance tools

The most pertinent LEG tools available under the various pieces of local government legislation, to be included in a local government legislative compliance matrix, could be classified in terms of their nature and extent as compliance-based LEG tools, governance-based LEG tools, governing-based LEG tools, and cross-cutting LEG tools.[394]

Compliance-based LEG tools are based on the principle that municipalities must comply with the relevant legal requirements as provided for in national and provincial legislation, including the management of environmental authorisations, permits and licences.[395] In terms of climate change and waste management, this will require compliance *inter alia* with the provisions of the eventual Climate Change Act, the NEMA, the NEM:WA and all the relevant regulations referred to in this study. There is a myriad of compliance provisions relating to climate change and waste management in legislation and it is not the purpose of this study to discuss the detail of such legal requirements in a compliance tool, but rather to identify the need on a strategic management level for the inclusion of the provisions in a detailed legal register.[396]

A municipality is responsible, as part of its governance function, for planning, controlling, regulating and verifying its processes and activities to be effective, efficient, transparent and accountable in the execution of its functions and duties. In executing this responsibility, a municipality must establish the necessary

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394 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 101.

395 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 101.

396 A legal register should include planning, implementation, monitoring, evaluation and reporting components such as a) the identification of legislation and regulations down to section levels; b) the identification of the competent authority managing the legislation c) the requirements of the provisions and how to comply with them; d) the municipality's compliance status; e) intervention strategies for compliance. Refer to Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 101-102.

structures and processes with the relevant checks and balances to ensure that the municipal council and administration execute their functions lawfully and responsibly.[397] These structures and processes form the governance-based LEG tools available to municipalities and are as follows:

- Municipal integrated development planning
- Performance management
- Budgeting and funding
- Supply chain management
- Human resource management; and
- Internal auditing.[398]

Governing-based LEG tools are tools to regulate the local community in terms of the powers vested in the municipality and include the following:

- By-laws and law enforcement;
- Structural tools, such as council and council committees; and
- Community participation.[399]

Tools used by municipalities that cannot easily be classified into one of the distinct categories discussed in this chapter are referred to as cross-cutting tools. The IWMP, which is required by section 11(4) of NEM:WA to be compiled by municipalities and included as part of the IDP, is an example of a cross-cutting LEG tool.[400]

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397 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 110. Nel further indicates that these principles are in line with the King III principles requiring a general duty of care, skill, diligence and adherence to fiduciary duties by municipal office bearers. Refer to para 4 of the King Report on Governance for South Africa (2009) and the King Code on Governance Principles (King III).

398 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 110.

399 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 115-129.

400 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 143-144.

4.3 Role and functions of Local Government seen through the lens of the Constitution

South African government is comprised of national, provincial and local spheres of government[401] which are distinctive, inter-dependent and interrelated.[402] All three spheres of government are bound by the provisions of the Constitution and must perform their functions within the prescripts of the Constitution.[403] A municipality, as an administration, is an "organ of state" operating at the local sphere of government.[404] The local government sphere is referred to as municipalities and consists of the political structures, the administration and the community it serves.[405] As an organ of state, a municipality is an independent entity with a separate legal personality, but at the same time it is interdependent on the other government organs or spheres of government with which it has to co-operate to be able to execute its functions and duties effectively.[406] The aforesaid implies that the status of local government has been elevated. A municipality is now a co-responsible organ of state that is accountable to the community it serves and is together with the national and provincial spheres of government responsible for the execution of constitutional mandates.[407] The enhanced status of local government was also confirmed in the Supreme Court of Appeal case of *CDA Boerderye v Nelson Mandela Metropolitan Municipality.*[408] The three spheres of government need to co-

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401 The local sphere of government consists of municipalities, established for the whole area of the Republic. Refer to s 151(1) of the Constitution.

402 Section 40(1) of the Constitution.

403 Section 40(2) of the Constitution.

404 Section 239 of the Constitution.

405 Steytler and De Visser *Local Government Law* 26. Also refer to s 2 of the *Municipal Systems Act 32 of 2000*. Section 2 of the Municipal Systems Act provides that the area of jurisdiction of the municipality is determined by the Municipal Demarcation Board in terms of the Demarcation Act, 1998. Also see Mokale and Scheepers *An introduction to the developmental local government system* 4.

406 Mokale and Scheepers *An introduction to the developmental local government system* 4.

407 Section 4(3) of the *Municipal Systems Act*. Du Plessis 2010 *Stell LR* 267 contends that although municipalities are an autonomous sphere of government, the duties of the state or the government, are to a certain extent also the duties of municipalities, unless it is explicitly stated otherwise.

408 *CDA Boerderye (Edms) Bpk v Nelson Mandela Metropolitan Municipality* 2007 4 SA 276 (SCA) para37. The Court stated that the Constitution conferred "a radically enhanced status on

operate with one another *inter alia* to ensure the well-being of the community[409] and in general to support one another in the execution of their respective functions in terms of the Constitution.[410] Christmas and De Visser[411] argue that:

> … of all the spheres of government, local government arguably has the most immediate developmental mandate to realize the ideal physical environment for the communities it serves.[412]

Du Plessis and Nel[413] also contend that the laws and policies pertaining to local government provide that municipalities must not only provide services as part of being a developmental government, but that municipalities should promote a safe and healthy environment and cooperate with other organs of state to realise the constitutional environmental right. Securing the well-being of the community could be directly linked to the section 24 environmental rights of the Constitution and in turn translate into the effective execution of the waste management function (which is not to be detrimental to the environment) and into the mitigation of the negative impacts of climate change. The Constitution confers legislative authority on government and more specifically on the Municipal Council[414] on the level of the local sphere of government.[415] When a municipality exercises its legislative mandate, it does so in the form of by-laws.[416] The executive power of a municipal council relates to planning, oversight over the implementation and monitoring of policies, resolutions and by-laws, whilst the legislative authority refers to the execution of law-making powers when the municipal council sits as the "parliament"

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municipalities", which is "materially different from the pre-constitutional era". Also refer to Du Plessis and Kotzé 2014 *JAL* 148.

409 Section 41(1)(b) of the Constitution.

410 Section 41 of the Constitution. National and provincial government in terms of s 154 of the Constitution must "through legislative and other measures support and strengthen the capacity of municipalities to manage their own affairs, to exercise their powers and toperform their functions".

411 Christmas and De Visser 2009 *Commonwealth Journal of Local Governance* 107.

412 The Constitutional Court in *Ngaka Modiri Molema District Municipality v Chairperson, North West Provincial Executive Committee* 2014 ZACC 31 para 1 confirmed this view.

413 Du Plessis and Nel "An Introduction" 6.

414 Section 151(2) of the Constitution provides that the executive and legislative authority of a municipality vests in its Municipal Council.

415 Section 43(c) of the Constitution.

416 Section 156(2) of the Constitution.

of the area.[417] A municipality may make and administer by-laws for the effective execution of any of its functions, subject to the proviso that a by-law may not conflict with the Constitution or national and provincial legislation.[418]

A municipality may govern and perform its functions and duties on its own initiative, without interference from other spheres of government,[419] provided that it does so within the constitutional, national and provincial legislative framework.[420] However, chapter 3 of the Constitution obligates all spheres of government to cooperate with one another in the execution of their powers and duties.[421] Du Plessis[422] states that cooperative governance means mutual support and cooperation between the different spheres of government and requires the alignment of functions and duties in relation to policies and laws.[423] Steytler and De Visser[424] contend that cooperative governance means that the different spheres of government are "bonded together by a common loyalty to the country, its people and the Constitution" and that the spheres of government must cooperate to ensure the well-being of the people of the country.

Section 152 of the Constitution sets out the objects of local government as:

(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;[425] and

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417 Mokale and Scheepers *An introduction to the developmental local government system* 87.
418 Section 156(2) and (3) of the Constitution.
419 Section 151(4) of the Constitution.
420 Section 151(3) of the Constitution. Section 139 of the Constitution, however, provides for provincial intervention when a municipality cannot or does not fulfil an executive obligation in terms of the Constitution or legislation.
421 Sections 40-41 of the Constitution.
422 Du Plessis 2010 *Stell LR* 276.
423 Matters of intergovernmental relations and cooperative governance are regulated in terms of the *Intergovernmental Relations Framework Act* 13 of 2005.
424 Steytler and De Visser *Local Government Law* 16-3.
425 Du Plessis 2015 *PELJ* 1856 contends that "this objective is complemented by the environmentally relevant areas of competence of local government such as air pollution, water and sanitation services, noise pollution, municipal health services and the management of solid waste."

(e) To encourage the involvement of communities and community organisations in the matters of local government.

The words "provide", "ensure" "promote" and "encourage" indicate that municipalities have a direct responsibility to ensure (they must see to it that it happens) service delivery to the community in a manner that promotes a safe and healthy environment.[426] In performing its functions, a municipality has a developmental duty[427] towards the community by prioritising the basic needs of the community and to promote the economic and social development of the community.[428] We have already established that an environment that is not harmful to the health and well-being of the community and the protection of the environment are basic needs and rights of the community.[429] Municipalities are obligated to participate in national and provincial programmes.[430] One such programme is "Working on Waste",[431] which was initiated by the DEFF under the

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426 Mokale and Scheepers *An introduction to the developmental local government system* 7.

427 The *White Paper on Local Government*, 1998 describes developmental local government as "local government committed to working with the community to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives". "Developmental local government has four interrelated characteristics, namely 1) maximising social development and economic growth; 2) integrating and coordinating; 3) democratising development; and 4) leading and learning". Steytler and De Visser *Local Government Law* 27 define developmental local government as "improving the financial position of the community, the upliftment of a community with reference to its social, economic, environmental, spatial, infrastructural, institutional, organizational and human resource aspects." The tools available to local government to achieve its developmental goals are integrated development planning and budgeting, performance management, and working together with local citizens and partners. Two of these tools, namely the IDP and performance management, will be discussed later in this chapter in addressing the function of waste management and the mitigation of the impacts of climate change. Also refer to s23 of the *Municipal System Act* relating to the developmental duty of a municipality.

428 Section 153(a) of the Constitution. states that "a municipality must structure and manage its administration, budgeting and planning processes to give priority to the basic needs of the community and to promote the social and economic development of the community".

429 Section 24 of the Constitution.

430 Section 153(b) of the Constitution

431 The objectives of the programme are to "create and support mechanisms for the protection of environmental quality; create sustainable livelihoods through recycling of waste (waste collection and minimisation); support the use of environmentally friendly waste disposal technology; and promote environmental education and awareness to the communities, especially as they are the main waste generators". The programme has the following projects: 1) the development of landfill sites 2) the construction of waste transfer stations 3) the construction of buy-back/recycling centres 4) construction material recovery facilities 5) composting facilities 6) street cleaning and beautification 7) domestic waste collection 8) the greenest municipalities' competition 9) integrated waste management plans.

auspices of the Expanded Public Works Programme (EPWP), recognising that inadequate waste services may lead to pollution, health hazards and environmental degradation.[432]

There are three types of municipalities, namely:

Category A: A municipality with exclusive municipal executive and legislative authority in its area,[433] also known as a metropolitan municipality.

Category B: A municipality sharing municipal executive and legislative authority in its area with a category C municipality in whose area it falls,[434] also known as a local municipality

Category C: A municipality with municipal executive and legislative authority in an area that includes more than one municipality,[435] also known as a district municipality.

Municipalities have the powers and functions set out in part B of Schedules 4 and 5 of the Constitution.[436] For purposes of this study it is important to take cognisance that refuse removal, refuse dumps and solid waste disposal are functions of local government.[437]

The Constitution also authorises municipalities to perform fiscal powers and functions and municipalities are authorised to impose rates on property and surcharges on fees for the services it provides.[438]

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432 DEFF 2019 https://www.environment.gov.za/projectsprogrammes/workingonwaste.
433 Section 155(1)(a) of the Constitution.
434 Section 155(1)(b) of the Constitution.
435 Section 155(1)(c) of the Constitution.
436 Section 156(1)(a) of the Constitution.
437 Part B of Schedule 5 of the Constitution.
438 Section 229(1) of the Constitution. The financial matters of municipalities are more comprehensively set out in the *Local Government: Municipal Finance Management Act* 56 of 2003.

4.4 Role and functions of Local Government through the lens of the Municipal Structures Act[439]

The MEC for local government establishes the different categories of municipalities in terms of the provisions of the *Local Government: Municipal Structures Act*, 1998.[440] Section 152 of the Constitution sets out the objects of local government that that a municipality should strive to achieve.[441]

The powers and functions of municipalities are regulated by the Constitution and Chapter 5 of the *Municipal Structures Act* regulates the division of functions between a district and a local municipality in the area of the district municipality, which include the function of waste management.[442] A district municipality has the functions set out in section 84(1) of the *Municipal Structures Act,* which include:[443]

> (a) Integrated development planning for the district municipality as a whole, including a framework for integrated development plans of all municipalities in the area of the district municipality.[444]

and

> (f) Solid waste disposal sites, in so far as it relates to-
>
> (i) the determination of a waste disposal strategy;
>
> (ii) the regulation of waste disposal;
>
> (iii) the establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for more than one local municipality in the district.[445]

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439 117 of 1998.

440 Section 12 read with s 14 of the *Municipal Structures Act.*

441 Section 19 of the *Municipal Structures Act*. Also refer to the discussion of the objects of local government under para 4.1.

442 Section 83(2) of the *Municipal Structures Act.*

443 The remainder of the s 84(1) functions of a district municipality are "integrated development planning; potable water supply systems; bulk electricity; domestic waste water and sewage disposal systems; municipal roads; the regulation of passenger transport; municipal airports; municipal health services; firefighting services; the establishment, conduct and control of fresh produce markets and abattoirs; the establishment, conduct and control of cemeteries and crematoria; the promotion of local tourism; public works relating to the municipality's functions; the receipt, allocation and distribution of grants; and the imposition and collection of taxes, levies and duties relating to the municipality's functions."

444 Section 84(1)(a) of the *Municipal Structures Act.*

445 Section 84(1)(f) of the *Municipal Structures Act.*

A local municipality must perform the powers and functions provided for in part B of schedules 4 and 5 of the Constitution, excluding the functions of the district municipality in whose area it falls, as indicated above.[446] The MEC for local government, in consultation with the Municipal Demarcation Board (MDB) and considering a capacity assessment of the municipality concerned,[447] may adjust the division of functions and powers between a district and a local municipality[448] if the municipality lacks the capacity to perform that function.[449] Local and district municipalities have an obligation to co-operate with one another by assisting and supporting one another in the execution of their functions and powers.[450] There are no clear definitions of the powers and functions of local government in the Constitution or legislation, but the MDB attempted to provide definitions of and norms and standards for such functions and powers.[451] The MDB defines the function of refuse removal, refuse dumps and solid waste disposal as follows:[452]

> Refuse removal, refuse dumps and solid waste disposal means the removal of any household or other waste and the disposal of such waste in an area, space or facility established for such purpose, and includes the provision, maintenance and control of any infrastructure or facility to ensure a clean and healthy environment for the inhabitants of a municipality.

In relation to the district municipality, it means:

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446 Section 83(2) of the *Municipal Structures Act.* Metropolitan Councils have the functions and powers set out in part B of Schedules 4 and 5 of the Constitution.

447 Section 85(2)(b) of the *Municipal Structures Act.*

448 Section 85(1) of the *Municipal Structures Act.*

449 Section 85(2)(a) of the *Municipal Structures Act.*

450 Section 88 of the *Municipal Structures Act.*

451 Villarmea 2003 https://www.academia.edu/11097824/Local_Government_Powers_and_Functions_Definitions_and_Norms_and_Standards 3.

452 Villarmea 2003 https://www.academia.edu/11097824/Local_Government_Powers_and_Functions_Definitions_and_Norms_and_Standards 106-107.

Solid waste disposal sites, in so far as it relates to-

i) the determination of a waste disposal strategy for the district as a whole;

ii) the regulation of waste disposal strategy for the district as a whole;

iii) the establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for more than one local municipality in the district.

In relation to the Local municipality, it means:

(i) The determination of a waste disposal strategy for the local municipality only

(ii) The regulation of local waste disposal for the local municipality only

(iii) The collection and removal of waste and transporting to a local waste disposal site, bulk transfer facility and district waste disposal site

(iv) The establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for the local municipality only.

A waste management system comprises of all the activities relating to the handling, treatment, disposal or recycling of waste materials and consists of four principle components, namely the generation or waste production, the collection and transport systems of waste, the treatment or transformation of waste into useful products, and disposal by means of recycling or at landfill sites.[453]

4.4.1 Oversight Role of the Executive Mayor

The executive mayor of a municipality must receive reports from committees of the municipal council and dispose of the matters under his delegated authority, if delegated. Otherwise, the executive mayor must forward the reports to the municipal council for consideration.[454] The executive mayor must identify the needs of the community regarding service delivery[455] and review and evaluate those needs in order of priority for implementation.[456] The executive mayor must also

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453 Demirbas 2011 *Energy Conversion and Management* 1281.

454 Section 56(1) of the *Municipal Structures Act*. The office of the executive mayor could be classified as a governing-based LEG tool as discussed under para 4.2.3.

455 Section 56(2)(a) of the *Municipal Structures Act.*

456 Section 56(2)(b) of the *Municipal Structures Act.*

recommend to the municipal council programmes, strategies, and services to address the identified priority needs through the IDP.[457]

In performing the duties, the executive mayor must develop criteria to evaluate the implementation and progress of the strategies and programmes against key performance indicators.[458] The municipality's performance needs to be reviewed to ensure the efficiency and effectiveness of the municipality and the compliance to and enforcement of its by-laws.[459] The mayor must oversee the provision of services such as waste management services to the communities in a sustainable manner.[460]

4.4.2 Committees of Council as a tool for oversight[461]

4.4.2.1 Section 79 Portfolio Committees

A municipality may establish committees as required for the effective and efficient performance of any of its functions and powers, such as waste management and climate change.[462] The municipal council determines the functions of the committees and delegates powers and duties to the committees.[463] The section 79 committees may also be authorised to co-opt advisory members who are not necessarily council members.[464] It stands to reason that a municipal council should have a section 79 oversight committee for the function of waste management and climate change to ensure the effective and efficient performance of the function and its related duties. Municipalities are encouraged to involve the community in local government matters[465] and they may use the committee system to allow

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457 Sections 56(2)(c) and (d) of the *Municipal Structures Act.*
458 Sections 56(3)(a) and (b) of the *Municipal Structures Act.*
459 Sections 56(3)(c)(i) and (iii) of the *Municipal Structures Act*.
460 Section 56(3)(e) of the *Municipal Systems Act.*
461 The various committees of council could be classified as governing-based LEG tools as discussed under para 4.2.3.
462 Section 79(1) of the *Municipal Structures Act.*
463 Sections 79(2)(a) and (b) of the *Municipal Structures Act.*
464 Section 79(2)(e) of the *Municipal Structures Act*.
465 Refer to s152(1)(e) of the Constitution. Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 132 contend that chapter 10 of the Constitution encourages community participation in the making of law and policies for the municipality and the planning function, enabling the municipality to identify and respond to the community needs.

community participation by consulting the community regarding the level and impact of services.[466]

4.4.2.2 Municipal Public Accounts Committee

A municipal council must establish a municipal public accounts committee (MPAC)[467] and determine its functions.[468] The functions of the MPAC should include *inter alia* the review of the Auditor-General's report[469] and the reports from internal audit and the audit committee of council.[470] The MPAC must develop an oversight report[471] on the council's annual report[472] and make recommendations to council on the annual report and any matter referred to it for investigation or matters investigated on its own initiative.[473]

The MPAC must submit its reports to the municipal council for consideration.

4.5 Role and functions of Local Government seen through the lens of the Municipal Systems Act[474]

The *Local Government: Municipal Systems Act* (hereinafter referred to as the *Municipal Systems Act*) confirms the provision in the Constitution that a municipality is an organ of state in the local sphere of government[475] and that it has the right to executive and legislative authority in the performance of its functions and powers and may govern on its own initiative.[476] The *Municipal Systems Act* echoes the

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466 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 132.
467 Section 79A of the *Municipal Structures Act.*
468 Section 79A(3) of the *Municipal Structures Act.*
469 In terms of s 131 of the MFMA "a municipality must address any issues raised by the Auditor-General in the audit report" and "the mayor must ensure compliance by the municipality".
470 Sections 79A(3)(a) and (b) of the *Municipal Structures Act.*
471 In terms of s 129 of the MFMA the municipality must "adopt an oversight report on the annual report including the council's comments on the annual report". The council may either approve the annual report without or with reservations, reject the annual report or refer the annual report back for the revision of specific components. Refer to s 129(1)(a) to (c).
472 Section 79A(c) of the *Municipal Structures Act.*
473 Sections 79A(d) and (e) of the *Municipal Structures Act.*
474 *Local Government Municipal Systems Act* 32 of 2000.
475 Section 2(a) of the *Municipal Systems Act*.
476 Section 4(a)and (b) of the *Municipal Systems Act*.

general empowerment of municipalities found in the Constitution and the *Municipal Structures Act* in that it has all the functions and powers conferred on it by the Constitution.[477] A municipality must render municipal services[478] to the local community in a financial and environmental sustainable manner[479] and to promote a safe and healthy environment.[480] The *Municipal Systems Act* defines "environmentally sustainable" in relation to the provision of municipal services as:

> … the provision of a municipal service in a manner aimed at ensuring that -
>
> (a) the risk of harm to the environment and to human health and safety is minimised to the extent reasonably possible under the circumstances;
>
> (b) the potential benefits to the environment and to human health and safety are maximised to the extent reasonably possible under the circumstances; and
>
> (c) legislation intended to protect the environment and human health and safety is complied with.[481]

The executive and legislative authority of a municipality is vested in the municipal council[482] and its executive and legislative authority are exercised by developing strategies, policies, plans, and programmes, including setting service delivery targets[483] and passing by-laws.[484] A municipality will therefore be able to implement and enforce its waste management strategy and compel its residents to comply therewith through its by-laws. Municipalities that have adopted Waste Management

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477 Section 8 of the *Municipal Systems Act.*

478 Municipal Service is defined in s 1 of the *Municipal Systems Act* as "a service that a municipality in terms of its powers and functions provides or may provide to or for the benefit of the local community". Furthermore, a "basic municipal service" means "a municipal service that is necessary to ensure an acceptable and reasonable quality of life and which, if not provided, would endanger public health or the safety of the environment".

479 Section 4(2)(d) of the *Municipal Systems Act*.

480 Section 4(2)(i) of the *Municipal Systems Act*.

481 Section 1 of the *Municipal Systems Act.*

482 Section 11(1) of the *Municipal Systems Act*.

483 Section 11(3)(a) of the *Municipal Systems Act*.

484 Section 11(3)(m) of the *Municipal Systems Act*. A by-law is defined in s 1 of the *Municipal Systems Act* as legislation passed by the council of a municipality.

by-laws are *inter alia* Cape Town Metropolitan Municipality,[485] eThekwini Metropolitan Municipality[486] and Johannesburg Metropolitan Municipality.[487]

Section 11(3) of the *Municipal Systems Act* sets out how a municipality exercises its executive and legislative authority by-

(a) developing and adopting policies, plans, strategies and programmes, including setting targets for delivery;

(b) promoting and undertaking development;

(c) establishing and maintaining an administration;

(d) administering and regulating its internal affairs and the local government affairs of the local community;

(e) implementing applicable national and provincial legislation and its by-laws;

(f) providing municipal services to the local community, or appointing appropriate service providers in accordance with the criteria and process set out in section 78;

(g) monitoring and, where appropriate, regulating municipal services where those services are provided by service providers other than the municipality;

(h) preparing, approving and implementing its budgets;

(i) imposing and recovering rates, taxes, levies, duties, service fees and surcharges on fees, including setting and implementing tariff, rates and tax and debt collection policies;

(j) monitoring the impact and effectiveness of any services, policies, programmes or plans;

(k) establishing and implementing performance management systems;

(l) promoting a safe and healthy environment;

(m) passing by-laws and taking decisions on any of the above-mentioned matters;

It is worthy of note that the Minister responsible for local government, at the request of organised local government, may make standard draft by-laws concerning a power or function of local government, which could also include the

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485 *Integrated Waste Management By-law*, 2009, published in Western Cape Provincial Gazette 6651 of 21 August 2009.

486 *Waste Removal By-laws*, 2009, published under MN 117 in KwaZulu Natal Provincial Gazette 1722 of 25 August 2016.

487 *Waste Management By-laws*, 2009, published under LAN 1012 in Gauteng Provincial Gazette 216 of 30 July 2013.

function of waste management.[488] Such a standard draft by-law is only applicable in a municipality if, and to the extent, it is adopted by the municipal council.[489] Similarly, the NEMA provides for the Minister of Environment Forestry and Fisheries to draft national model environmental management by-laws to establish measures to manage the environmental impacts of any development in the area of jurisdiction of a municipality.[490]

4.5.1 Integrated development planning as a Municipal Systems Act tool relating to waste management and climate change

The *White Paper on Local Government* identifies integrated development planning as a major tool that could assist municipalities to develop comprehensive short-, medium- and long-term developmental plans to address economic, social and environmental challenges.[491]

Each municipality must adopt an IDP.[492] The IDP is a single, inclusive and strategic plan for the development of the municipality, which sets out the vision of the municipality regarding development, operational strategies and service delivery. The development plans of the municipality must be linked,[493] integrated and co-ordinated in the IDP, resources and capacity must be aligned to implement the IDP,[494] the IDP must be aligned with national and provincial plans[495] and the annual

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488 Section 14(1) of the *Municipal Systems Act.* The Minister responsible for local government has made standard waste management by-laws available. It can be accessed at Waste Management Municipal Bylaws date unknown https://cogta.mpg.gov.za/policies/ByLaws/WasteManagByLaw.pdf.

489 Section 14(3) of the *Municipal Systems Act.*

490 Section 46(1) of the NEMA. Also refer to Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 122.

491 Section B para 3.1 of the *White Paper on Local Government*. Also refer to Asha and Madzivhandila 2016 *Journal of Public Administration* 162.

492 Section 25 of the *Local Government: Municipal Systems Act*. The IDP is a governance-based LEG tool as discussed under para 4.2.2. Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 111 expresses the opinion that the IDP as a governance-based LEG tool is strengthened by the fact that the IDP is subject to provincial monitoring and support and that the IDP must be reviewed on an annual basis.

493 Section 25(1)(a) of the *Municipal Systems Act.*

494 Section 25(1)(b) of the *Municipal Systems Act.*

495 Section 25(1)(e) of the *Municipal Systems Act.*

budget must be based on the IDP as the policy framework.[496] Integrated planning in the IDP is required to achieve the objects of local government and to comply with the developmental duties of municipalities, and as part of cooperative government it must contribute to the realisation of the constitutional rights, including the section 24 constitutional environmental rights.[497] Taylor *et al*[498] contend that it is of significant relevance to climate change mitigation that the *Municipal Systems Act* obliges a municipality to undertake development-orientated planning that must "contribute to the progressive realisation of the fundamental rights contained in section24 of the Constitution, which include the right to an environment that is not harmful to people's health or well-being".[499] Taylor *et al* further contends that climate change may have a serious impact on the long-term developmental goals of municipalities and therefore climate change mitigation measures need to be included in a municipalities IDP. In terms of section 26 of the *Municipal Systems Act*, the IDP must have certain core components, including a financial plan[500] and the council's development strategies, which must be aligned with the sectoral plans and planning requirements of national and provincial government.[501] Furthermore, the aforesaid must be linked to key performance indicators and performance targets.[502] The IDP is also critical for the internal governance of a municipality, as a municipality must conduct its functions and duties in alignment with the IDP.[503] As set out earlier in this study, waste

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496 Section 25(1)(c) of the *Municipal Systems Act.*

497 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 112.

498 Taylor *et al* "Urban Adaptation" 11-12.

499 Also see s 23(1)(c) of the *Municipal Systems Act*.

500 Section 26(h) of the *Municipal Systems Act.*

501 Section 26(d) of the *Municipal Systems Act.* S 7 of the *Climate Change Bill* 2018 requires that "every organ of state must coordinate and harmonise the policies, plans, programmes and decisions of the national, provincial and local spheres of government that exercise functions that effect or are affected by climate change or are entrusted with powers and duties aimed at the achievement, promotion, and protection of a sustainable environment, in order to ensure that the risks of climate change impacts and associated vulnerabilities are taken into consideration - and give effect to the national adaptation and mitigation objectives set out in this Act". Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 111 state that the linkage between the IDP and environmental planning, management and performance is contained in various national environmental sector laws, such as IWMPs.

502 Section 26(i) of the *Local Government: Municipal Systems Act*.

503 Section 36 of the *Municipal Systems Act.*

management and climate change are constitutional mandates of local government and should form part of the core components of the IDP.[504] The IDP is important to the governance of the municipality as the municipality must conduct its affairs in line with the IDP[505] and therefore the IDP could be a key tool to address the impacts of waste management and climate change at a local level.[506] The IDP should include waste management and mitigation strategies as part of the overall vision and mission of the municipality. If waste management is part of the IDP, this could ensure that a proper framework is provided to guide the municipality in linking the necessary strategies, human, financial and other resources to the function of waste management. In fact, the NEM:WA requires the inclusion of an IWMP as part of the IDP.[507] Du Plessis[508] and Asha and Madzivihandila[509] state that various municipalities have included environmental and climate change matters in their IDPs, such as deforestation, erosion, water scarcity, lack of access to social structures, and the limited knowledge and understanding of climate issues. Unfortunately, no clear strategies were formulated to address the identified challenges. Due to the envisaged extensive consultation process during the process of compiling the IDP, better awareness amongst all the stakeholders of the municipality of the challenges facing local government regarding waste management and climate change could possibly be instilled.[510] The IDP could possibly also ensure that waste management and climate change matters would not only be seen and remain a challenge for the waste and sanitation departments, but could be made a cross-cutting matter to be addressed across all the departments in the municipality. Municipalities that have adopted climate change policies or strategies are *inter alia* the City of Cape Town Metropolitan

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504 Refer to para 3.2.
505 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 112. Also refer to s 36 of the *Municipal Systems Act*.
506 Asha and Madzivihandila 2016 *Journal of Public Administration* 154.
507 Section 11(4) of the NEM:WA. Also refer to the discussion of the IWMP in chapter 3 para 3.3.7.
508 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 112.
509 Asha and Madzivihandila 2016 *Journal of Public Administration* 162.
510 Sections 28(2) and (3) of the *Municipal Systems Act*.

Municipality[511] and eThekwini Metropolitan Municipality.[512] The IDP of the municipality is submitted to the MEC for local government for consideration and this will ensure the alignment of municipal IDPs with provincial programmes.[513] Further alignment can be found in one of the strategic priorities of the *National Climate Change Response White Paper*.[514] The strategic priority of integrated planning-

> Prioritises the mainstreaming of climate change considerations and responses into all relevant sector, national, provincial and local planning regimes such as, but not limited to, the Industrial Policy Action Plan, Integrated Resource Plan for Electricity Generation, Provincial Growth and Development Plans and **Integrated Development Plans**.[515] (My own emphasis)

An IDP is the principle strategic planning tool of a municipality informing and guiding all planning and development[516] and binds the municipality in the execution of its executive authority.[517] It could be said that if a plan is not included in the IDP, it will not be budgeted for and it will not be implemented. A municipality is obliged to implement its IDP and perform its functions and powers in alignment with the provisions of the IDP.[518] It is therefore imperative that the function of waste management is comprehensively included in the IDP and is not a separate chapter in the IDP. Climate change mitigation and adaptation need to be considered for each function or power. The IDP must be reviewed every year and amended in line with the outcomes of its performance and to adapt to the demand of changing circumstances.[519] This amendment cycle will ensure that municipalities can take appropriate and timeous action to adapt to the changing requirements of mitigating climate change. Nel[520] contends that the legal framework for IDPs is "enabling" in that it sets only the minimum requirements for the content of an IDP and that it

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511 City of Cape Town 2017 http://savingelectricity.org.za/wp-content/uploads/2018/01/climate_change_policy.pdf.

512 eThekwini Municipality Council 2014 http://www.durban.gov.za/City_Services/energyoffice/Pages/DurbanClimateChangeStrategy.aspx.

513 Section 32 of the *Municipal Systems Act.*

514 *National Climate Change Response White Paper*, 2011.

515 *National Climate Change Response White Paper*, 2011 15.

516 Section 3(a) of the *Municipal Systems Act.*

517 Section 35(b) of the *Municipal Systems Act.*

518 Section 36 of the *Municipal Systems Act.*

519 Section 34 of the *Municipal Systems Act.*

520 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 112.

therefore allows municipalities to use integrated planning, in tandem with other tools such as performance management, to leverage resources and to set specific targets and work towards achieving the targets concerned. Du Plessis and Kotzé[521] aver that IDPs which include the spatial development framework (SDF) and environmental sector plans could be used to respond to climate change risks and threats. They further contend that a comprehensive climate change response must be included in the planning and implementation priorities of municipalities to reach South Africa's climate change objectives, which is in fact an integral part of the IDP. According to Roberts[522] the successful institutionalisation of climate change in the planning, decision making and daily operations of a municipality could be achieved as follows. An administrative or political champion for climate change matters could be identified who would ensure that climate change matters are considered in all municipal operations.[523] Climate change must be included in the IDP and other sector plans such as the IWMP and SDF as a major focus point, which would ensure that the necessary resources are allocated to address climate change matters.[524] Lastly, climate change considerations should be incorporated in the administrative and political decision making processes.[525] The DEFF developed a website to provide stakeholders, such as municipalities with information and tools to respond to climate change at a local government level. The *Let's Respond Toolkit* provides guidance to municipalities on how to include climate change in municipal planning processes.[526]

4.5.2 Community participation as an oversight tool

A municipality is obliged to include the inputs of the community in a participatory governance system.[527] The municipality must encourage and create conditions for

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521 Du Plessis and Kotzé 2014 *JAL* 158.
522 Roberts 2008 *Environment and Urbanisation* 527.
523 Roberts 2008 Environment and Urbanisation 527-528.
524 Roberts 2008 Environment and Urbanisation 533-534.
525 Roberts 2008 Environment and Urbanisation 535.
526 *Local Government Climate Change Support Program* http://www.letsrespondtoolkit.org.
527 Section 16(1) of the *Municipal Systems Act.*

the participation of the community in the affairs of the municipality, which *inter alia* include the following:[528]

- The preparation, implementation and review of its IDP;
- The establishment, implementation and review of its PMS;
- The monitoring and review of its performance, including the outcomes and impact of such performance;
- The preparation of its budget; and
- Strategic decisions relating to the provision of municipal services.[529]

Community members have the right to participate in municipal governance by contributing to the decision-making processes; submit representations, complaints and recommendations; receive information on decisions of the council affecting their rights and property; regularly be informed of the state of affairs of the municipality; and have access to municipal services.[530] A municipality must on the other hand be responsive to the needs of the community; establish relationships and communication measures between the municipality and the community; and give the community information on services rendered and how the municipality is managed.[531] A municipality must display all documents that must be made public by the municipality in terms of the MFMA, the *Municipal Systems Act* or other applicable legislation on the municipality's official website.[532] The official website must be maintained and updated regularly by the municipal manager.[533]

The importance of the principles of participative governance and transparency were dealt with extensively in the landmark Constitutional Court judgment in the *Doctors*

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528 Section 16(1)(a) of the *Municipal Systems Act.*
529 Sections 16(1)(a)(i) to (v) of the *Municipal Systems Act.*
530 Section 5(1) of the *Municipal Systems Act*. The public may participate in the municipal budget process (s 22 of the MFMA) and the consideration of the municipality's annual report (s 130 of the MFMA).
531 Section 6(2) of the *Municipal Systems Act.*
532 Section 21A of the *Municipal Systems Act.*
533 Section 21B(3) of the *Municipal Systems Act.*

for Life International v Speaker of the National Assembly case.[534] Ngcogo J remarked:

> In the overall scheme of our Constitution, the representative and participatory elements of our democracy should not be seen as being in tension with each other. They must be seen as mutually supportive. General elections, the foundation of representative democracy, would be meaningless without massive participation by the voters. The participation by the public on a continuous basis provides vitality to the functioning of representative democracy. It encourages citizens of the country to be actively involved in public affairs, identify themselves with the institutions of government and become familiar with the laws as they are made. It enhances the civic dignity of those who participate by enabling their voices to be heard and taken account of. It promotes a spirit of democratic and pluralistic accommodation calculated to produce laws that are likely to be widely accepted and effective in practice. It strengthens the legitimacy of legislation in the eyes of the people. Finally, because of its open and public character it acts as a counterweight to secret lobbying and influence peddling. Participatory democracy is of special importance to those who are relatively disempowered in a country like ours where great disparities of wealth and influence exist.

The importance of public participation is clear from the *Doctors for Life International* case to establish the need of the local community, provide legitimacy to municipal planning processes and to establish the necessary buy-in and cooperation from the local community. The court also found asserted that the community has a right to participate in the functioning of a municipality and the municipality has a duty towards public participation.[535]

In *Borbet South Africa (Pty) Ltd & Others v Nelson Mandela Bay Municipality*[536] the constitutional court asserted that public participation at a municipal level must go beyond being a mere formality where public meetings are called, and information shared. Public participation must grant the community meaningful opportunities to participate, and municipalities must ensure that the community has the ability and the capacity to take advantage of public participation opportunities.[537]

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534 *Doctors for Life International v Speaker of the National Assembly* 2006 6 SA 416 (CC) para 115.

535 *Doctors for Life International v Speaker of the National Assembly* 2006 6 SA 416 (CC) para 129.

536 *Borbet South Africa (Pty) Ltd & Others v Nelson Mandela Bay Municipality* 2014 (5) SA 256 (ECP)

537 *Borbet South Africa (Pty) Ltd & Others v Nelson Mandela Bay Municipality* para 19

Nel, Du Plessis and Du Plessis[538] contend that the benefits of public participation are that the public, who are interested and affected parties, have the opportunity to be informed about plans and proposals relating to sustainability and to comment thereon. Public participation is the primary method to source local knowledge pertinent in the development of LEG tools such as IDPs, PMSs and by-laws. Public participation could also be utilised in the monitoring of EMPs and other municipal plans, policies and processes.[539]

However, despite the legal obligation towards public participation, it is not effective in most municipalities in South Africa. Municipal officials have reduced public participation to a technical exercise only to ensure legal compliance.[540]

In terms of the *Municipal Planning and Performance Management Regulations*, 2001, municipalities have a specific mandate to establish a forum for community participation in the drafting and implementation of the IDP as well as the monitoring, measurement and review of the municipality's performance in relation to KPIs and performance targets.[541] The municipality must convene regular meetings with the IDP representative forum to discuss the aforementioned matters and allow members of the forum to consult with their respective constituencies[542] and afford an opportunity to comment on the final draft of the IDP.[543] It was indicated in paragraph 4.4.1 that matters relating to the function of waste management and the mitigation of climate change should be included in the IDP and therefore the community through the IDP representative forum will have oversight over the functions concerned and be able to evaluate and monitor implementation.[544]

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538 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 135.
539 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 136.
540 De Visser *Developmental Local Government: A case study of South Africa* 14-15.
541 Section 15(1)(a) of the *Municipal Planning and Performance Regulations*, 2001.
542 Section 15(2)(b) of the Municipal Planning and Performance Regulations, 2001.
543 Section 15(3) of the Municipal Planning and Performance Regulations.
544 Certain environmental legislation also provides for public participation, such as s 24 of the NEMA relating to the EIA process; and the NEM:WA requires public consultation before the adoption of municipal waste by-laws.

4.5.3 Performance Management as a Municipal Systems Act tool relating to waste management and climate change

The *White Paper on Local Government* also indicates performance management as a tool to achieve the municipality's developmental outcomes.[545] Performance management is important to ensure that the plans of the municipality are being implemented, that they achieve the envisaged development outcomes and impacts, and that resources are utilised effectively and efficiently.[546] The management expert Peter Drucker contends that "only what gets measured, gets managed".[547] To monitor and evaluate the performance of the municipality a performance management system (PMS) in accordance with the, objectives, indicators, priorities and targets contained in its IDP must be established.[548] Nel[549] states that the PMS of a municipality complements the IDP, service delivery and budgeting, as a municipality must report performance against environmental strategies, targets, priorities and key performance indicators (KPIs) committed towards in the IDP. Taylor *et al*[550] contend that there nothing prohibits a municipality from including climate change mitigation targets, indicators and objectives in the PMS, as long as the provisions are in line with the *Municipal Systems Act.* Therefore, if mitigation measures and objectives are contained in the municipality's IDP, the relevant targets and KPIs may form part of the PMS. The executive mayor of the municipality must manage the PMS and assign responsibilities in terms of the PMS to the municipal manager.[551] The PMS must contain measures for monitoring and

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545 Section B para 3 of the *White Paper on Local Government*.

546 Section B para 3.2 of the *White Paper on Local Government.* PMS is classified as a governance-based LEG tool as discussed in para 4.2.2. Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 113 contend that as a governance-based LEG tool, PMS acts as an internal assurance function, enabling the audit committee and other structures responsible for performance monitoring to verify environmental governance performance and ensure compliance with internal controls.

547 Klaus *Measuring Customer Experience* 81.

548 Section 38 of the *Municipal Systems Act*.

549 Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 113.

550 Taylor *et al* "Urban Adaptation" 11-12.

551 Section 39(a) and (b) of the *Municipal Systems Act.*

review.[552] Taylor *et al*[553] express the opinion that the assignment of climate change objectives should be done to promote cross-departmental implementation and to obtain administrative and political buy-in, which in turn will facilitate the implementation of such climate change objectives.

The core components of a PMS are:[554]

(a) set appropriate key performance indicators as a yardstick for measuring performance, including outcomes and impact, with regard to the municipality's development priorities and objectives set out in its integrated development plan;

(b) set measurable performance targets with regard to each of those development priorities and objectives;

(c) with regard to each of those development priorities and objectives and against the key performance indicators and targets set in terms of paragraphs (a) and (b)-

  (i) monitor performance; and

  (ii) measure and review performance at least once per year;

(d) take steps to improve performance with regard to those development priorities and objectives where performance targets are not met; and

(e) establish a process of regular reporting to -

  (i) the council, other political structures, political office bearers and staff of the municipality; and

  (ii) the public and appropriate organs of state.

The results of the municipal PMS must be audited as part of its internal audit processes as well as by the Auditor-General.[555] An annual performance report must be prepared indicating the performance of the municipality, comparing targets set against the actual targets reached and proposing measures for the improvement of performance.[556] The *Municipal Systems Act* provides for mechanisms for the national and provincial monitoring of the performance of municipalities, whereby under-performing municipalities are identified, remedial action is proposed and

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552 Section 40 of the *Municipal Systems Act.*
553 Taylor *et al* "Urban Adaptation" 11-13.
554 Section 41 of the *Municipal Systems Act.*
555 Section 45 of the *Municipal Systems Act.*
556 Section 46 of the *Municipal Systems Act.*

reports are published in the Government and Provincial Gazettes.[557] In terms of the PMS the municipality should implement measures to improve performance of the development priorities and KPIs not reached and establish a reporting system to regularly report on performance levels to the community and other government stakeholders.[558]

The manager of a municipality is the head of administration and responsible and accountable for economical, effective, efficient and accountable administration, the implementation of the municipality's by-laws, IDP, budget and policies, managing the resources of the municipality as well as public participation.[559]

Mokale and Scheepers[560] contend that the PMS of a municipality is a tool in the strategic management process and must distinguish between the measurement of the performance of the municipality as an institution and the performance of the municipal manager and senior management in terms of their performance management contracts. Mokale and Scheepers[561] further contend that the employment and performance contracts of senior management cannot be separated from the municipal PMS as both have the same objective, namely more effective, efficient and accountable service delivery.

In terms of section 57 of the *Municipal Systems Act*, a municipality must enter into an employment contract[562] and a separate performance agreement[563] with the municipal manager and senior managers reporting directly to the municipal manager. The performance agreement should set contain performance objectives and targets to be met within predetermined timeframes.[564] Bonuses based on performance may be awarded[565] and the employment contract may be terminated

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557 Sections 47 and 48 of the *Municipal Systems Act*.
558 Section 4(1)(d) of the *Municipal Systems Act.*
559 Section 55 of the *Municipal Systems Act.*
560 Mokale and Scheepers *An introduction to the developmental local government system* 198.
561 Mokale and Scheepers *An introduction to the developmental local government system* 199.
562 Section 57(1)(a) of the *Municipal Systems Act*.
563 Section 5791)(b) of the *Municipal Systems Act*.
564 Section 57(4)(a) of the *Municipal Systems Act*.
565 Section 57(4B) of the *Municipal Systems Act*.

if the performance agreement is not complied with.[566] The mayor of the municipality must ensure that the performance agreements of the senior management of the municipality are linked to the measurable performance objectives contained in the approved service delivery and budget implementation plan (SDBIP) of the municipality.[567]

Targets for achieving compliance with waste management legislation and policies as well as targets for mitigating the impact of the municipality's activities on climate change should be used as a tool to motivate municipal officials to adhere to the various pieces of legislation, strategies and policies relating to waste management and mitigating the impact of climate change.

4.5.4 Development and adoption of policies and law-making as a Municipal Systems Act tool relating to waste management and climate change

A municipality needs to adopt and implement policies to co-ordinate and effectively execute its functions and duties.[568] Such a policy may indicate the vision of the municipality towards developmental governance as well as what the municipality will do to reach its set goals. Policies guide the administration of the municipality in the execution of its tasks and co-ordinate the efforts of the administration. Policy making is a political function performed by the municipal council, and policies become official and binding the municipality once approved by the municipal council.[569]

Section 24 of the Constitution creates a positive duty on local government to adopt reasonable legislative and other measure to give effect to socio-economic rights such as environmental rights. In the case of local government this obliges municipalities to in addition to adopt by-laws, it should adopt policies to realise

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566 Section 57(6)(b) of the *Municipal Systems Act*.
567 Section 53(1)(iii) of the MFMA.
568 The development of By-laws is classified as a governing-based LEG tool as discussed under para 4.2.3.
569 Mokale and Scheepers *An introduction to the developmental local government system* 50-51.

socio-economic rights.[570] This duty is consistent with the executive and legislative authority of a municipality as provided for in section 11(3) of the Systems Act.[571]

A municipality makes law in order to give effect to its constitutional purpose, aims and objects[572] and to give effect to the policies of the municipality towards third parties and the community it serves. Mokale and Scheepers[573] contend that "the policy of a municipality states 'what' the municipality wants to do or has to do, while the law says 'how' it has to be done". By-laws may follow and be guided by municipal policies, strategies, programmes and plans such as the IDP.[574] Du Plessis[575] believes that the development and implementation of environmental policy and law could be employed as tools to set targets, KPIs and substantive standards, and to place duties and political commitments on the municipality in the fulfilment of environmental rights and core environmental obligations. The fulfilment of environmental rights could come to nothing without the necessary environmental policy and legislation, which serves as a pre-requisite for compliance with and the enforcement and monitoring of the fulfilment of environmental rights.[576] Section 9 of the NEM:WA obliges municipalities to adopt by-laws. Sections 11 to 15 of the *Municipal Systems Act* set out the procedure for adopting by-laws by the municipal council.[577] It is clear from the aforesaid that policy and law making is another important tool for use by municipalities in managing the function of waste management and mitigating factors for climate change., It ensures clear direction and co-ordination of the execution of the function and ensures compliance by being binding on the municipality and the community.

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570 Fuo 2013 *PELJ* 13-14

571 Fuo 2013 *PELJ* 15

572 Sections 152 and 153 of the Constitution.

573 Mokale and Scheepers *An introduction to the developmental local government system* 88.

574 Section 11(3)(a) of the *Municipal Systems Act*. Also refer to Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 166 for further information relating to by-law development.

575 Du Plessis 2010 *Stell LR* 285.

576 Du Plessis 2010 *Stell LR* 284-285.

577 Also refer to Mokale and Scheepers *An introduction to the developmental local government system* 87-94 for a detailed discussion on the process of law making by a municipal council.

The enforcement of the by-laws of a municipality is regulated by Chapter 11 of the *Municipal Systems Act* and makes provision for municipalities to issue fines[578] and/or institute legal proceedings against transgressors.[579] Du Plessis[580] contends that non-compliance with the environmental law may result in the negation of a municipality's constitutional environmental duties and obligations in terms of section 24 of the Constitution. To achieve compliance with environmental law, the law needs to be enforced in order to compel, convince and motivate people and organisations not to act in such a manner as to contravene the law, to monitor the law and to deal with those who transgress the law.[581] Municipalities are compelled to enforce their environmental by-laws and in doing so municipalities may establish a municipal police service and appoint environmental health practitioners and environmental management inspectors.[582] Municipalities may also establish municipal courts to enforce their By-laws.[583] The National Prosecuting Authority may authorise an employee of the municipality to act as a prosecutor and institute criminal proceedings against persons contravening municipal By-laws, such as environmental and waste management By-laws, as well as other environmental legislation administered by the municipality.[584]

4.5.5 Provision of environmental infrastructure

The provisions of sufficient infrastructure to deal with waste-related matters is central to the fulfilment of environmental rights and the execution of the waste management function. In relation to the subject of this study, the provision of environmental infrastructure is the provision of refuse removal, refuse dumps and

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578 Section 111 of the *Municipal Systems Act*. Law enforcement is classified as a governing-based LEG tool as discussed under para 4.2.3.

579 Section 112 of the *Municipal Systems Act*.

580 Du Plessis 2010 *Stell LR* 286.

581 Du Plessis 2010 *Stell LR* 286-287.

582 For a detailed discussion of environmental law enforcement by municipalities, refer to Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 122-130.

583 Section 166(e) of the Constitution.

584 Section 112 of the *Municipal Systems Act* read with s 22(8) of the *National Prosecuting Authority Act* 32 of 1998. Also see Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance" 121-125 for a more detailed discussion of law enforcement by municipalities.

solid waste disposal infrastructure.[585] The provision of infrastructure is in the executive authority of the municipality. In terms of the "Working on Waste" programme of the DEFF, the following infrastructure needs to be addressed in achieving the objectives of the waste hierarchy:[586]

- Development of landfill sites;
- Construction of recycling centres/buy-back;
- Construction material and waste recovery facilities;
- Composting facilities; and
- Domestic waste collection.

4.5.6 Performance Audit Committee as an oversight tool

A municipality must appoint a performance audit committee consisting of at least three members. The majority of the members may not be staff or councillors of the municipality.[587] The performance audit committee is mandated to monitor and evaluate the quarterly performance audit reports of the internal audit unit,[588] consider improvements on the municipal performance management system and make recommendation thereon to council.[589] The economy, efficiency, effectiveness and impact of the key performance indicators and performance targets set by the municipality must be taken into account by the performance audit committee when reviewing the performance management system.[590] As a municipality has to set performance targets and indicators for all its functions, waste management and climate change should be part of the performance review of the performance audit committee.

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585 Du Plessis 2010 *Stell LR* 287.
586 DEFF 2019 https://www.environment.gov.za/projectsprogrammes/workingonwaste.
587 Section 14(2)(a) of the *Planning and Performance Management Regulations*, 2001. The performance audit committee will be classified as a governing-based LEG tool as discussed under para 4.2.3.
588 Section 14(4)(a)(i) of the *Planning and Performance Management Regulations*, 2001.
589 Section 14(4)(a)(ii) of the *Planning and Performance Management Regulations*, 2001.
590 Section 14(4)(b) of the Planning and Performance Regulations, 2001.

4.6 Local Government: Municipal Finance Management Act, 2003 tools for the evaluation and monitoring of waste management and climate change mitigation efforts

4.6.1 Service Delivery and Budget Implementation Plan

A municipality must approve a SDBIP for the implementation of the municipality's delivery of services and its annual budget.[591] De Visser[592] avers that although the obligation of municipalities to compile and approve a SDBIP is contained in the MFMA, it is not only a financial document or instrument. The SDBIP is an action plan linked to the budget and annual performance of the municipality and should be drafted with inputs from all the departments of the municipality. It therefore goes without saying that the functions of waste management and climate change must be included in the SDBIP. The SDBIP is a plan adopted annually that contains projections for each month of revenue and expenditure and also includes quarterly service delivery targets and performance indicators.[593] De Visser[594] contends that there is an important link between the IDP and the SDBIP as it enhances the municipality's capacity to monitor and evaluate the implementation of the IDP and to react to any challenges experienced with the implementation of the IDP. It also facilitates the drafting of the performance agreements of senior managers to link their performance directly to the IDP. De Visser[595] further contends that the SDBIP, as a practical "hands on" document, creates an opportunity for provincial and national departments to monitor the performance of municipalities, as the monthly income and expenditure projections and quarterly performance indicators and targets clearly set out in the SDBIP.

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591 Section 53(1)(c)(ii) of the MFMA. The SDBIP will be classified as a governance-based-tool as discussed under para 4.2.2.
592 De Visser 2007 *Local Government Bulletin* 2.
593 Section 1 (definition of SDBIP) of the MFMA.
594 De Visser 2007 *Local Government Bulletin* 2.
595 De Visser 2007 *Local Government Bulletin* 2.

4.6.2 The internal audit unit as a monitoring tool

Each municipality must establish an internal audit unit[596] that must compile an annual risk-based audit plan and an internal audit programme.[597] The internal audit unit must report to the accounting officer and the audit committee on the implementation of *inter alia* accounting procedures and practices, internal auditing, internal controls, and performance management contained in the internal audit plan.[598] Implementing mechanisms, systems and processes for auditing performance measurements must be developed.[599] The auditing of the performance of the municipality must include an assessment of the effective and efficient functioning of the municipality's performance management system[600] and of the reliability of the performance measurements against set indicators.[601] The internal audit unit must continuously audit the performance indicators and targets of the municipality and submit quarterly reports on its audit findings to the municipal manager and the performance audit committee.[602] The performance of the functions of waste management and climate change would therefore be evaluated and reported on by the internal audit unit.

4.6.3 Audit Committees as monitoring tools

Each municipality must establish an audit committee as an independent advisory body.[603] The audit committee must *inter alia* advise the municipality on risk management, performance management, effective governance and performance evaluation.[604] The audit committee consists of at least three persons with relevant

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596 Section 165(1) of the MFMA.
597 Section 165(2)(a) of the MFMA. The internal audit unit will be classified as a governance-based LEG tool as discussed under para 4.2.2.
598 Section 165(2) of the MFMA.
599 Section 14(1)(b) of the *Planning and Performance Management Regulations*, 2001.
600 Section 14(1)(b)(ii) of the *Planning and Performance Management Regulations*, 2001.
601 Section 14(1)(b)(iii) of the *Planning and Performance Management Regulations*, 2001.
602 Section 14(1)(c) of the *Planning and Performance Management Regulations*, 2001.
603 Section 166(1) of the MFMA. The audit committee will be classified as a governing-based LEG tool as discussed under para 4.2.3.
604 Section 166(2)(a) of the MFMA.

experience, of whom the majority are not employees of the municipality.[605] The audit committee works closely with the internal audit unit and the auditor-general.[606]

4.7 Conclusion

This chapter provided a brief overview of the South African local government environmental law and climate change legal landscape . The chapter aims to determine the legal regulatory framework for local government relating to the rendering of climate change and waste management serives. The LEG tools available to monitor and evaluate the effective and efficient rendering of the said services were elucidated.

In the introduction to this chapter a brief overview of the classification of LEG tools in terms of their nature and extent was provided.[607] It was indicated that there are compliance-based, governance-based, governing-based and cross-cutting LEG tools, and the different tools available under various pieces of local government legislation were identified later in the chapter.

The chapter commenced with an overview of the Constitution. It was indicated that the Constitution establishes local government as a distinctive sphere of government that is required to cooperate with national and provincial government in the execution of its functions and duties.[608] The Constitution sets out the powers and duties of municipalities and confers executive and legislative mandates on local government to execute environmental functions, including refuse removal, the establishment and management of refuse dumps, and solid waste disposal.

Flowing from the Constitution, the chapter elucidated that the *Municipal Structures Act* establishes different categories of municipalities and sets out the powers and

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605 Section 166(4)(a) of the MFMA.
606 Section 166(3) of the MFMA.
607 Refer to para 4.1.
608 Refer to para 4.2.

functions of the different municipalities, in line with the provisions of the Constitution, including integrated planning and refuse removal, refuse dumps and solid waste disposal.[609] A definition by the MDB of the function of refuse removal, refuse dumps and solid waste disposal was given to explain the content of the function of waste management. The role of the executive mayor, section 79 portfolio committees and the MPAC as LEG tools to monitor and evaluate the rendering of environmental services was discussed.[610]

The *Municipal Systems Act* was discussed next, and it was shown that a municipality as an organ of state has the right to exercise its executive and legislative authority in the execution of its powers and functions and to govern on its own initiative.[611] A municipality may therefore execute its function of waste management and compel stakeholders and its residents to comply therewith through its by-laws. A brief overview of how a municipality exercises its legislative authority was given. A discussion on the LEG tools available under the *Municipal Systems Act* followed, starting with an in-depth discussion of the IDP as a tool relating to waste management and climate change.

It was indicated that the IDP is a single, inclusive and strategic plan for the development of the municipality, guiding the municipality to achieve its objects as set out in the municipal vision regarding development, to comply with its developmental duties and to contribute towards the realisation of its constitutional rights.[612] The core elements of an IDP were set out, of which waste management and climate change should form an integral part. Attention was also drawn to the fact that the NEM:WA compels a municipality to include its IWMP in the IDP. The significance of the IDP as an LEG tool was highlighted, as the municipality is obliged to implement its IDP, which contains all the municipality's objectives, targets, KPIs, budget and performance monitoring mechanism. It not only sets a regulatory

609 Refer to para 4.3.
610 Refer to paras 4.3.1 and 4.3.2.
611 Refer to para 4.4 and section 151 of the Constitution.
612 Refer to para 4.4.1.

environment for the municipality but also provides the tools to monitor and evaluate its performance in the rendering of environmental services.

The importance of community participation as an LEG oversight tool was indicated, in that members of the community as interested and affected parties have the opportunity to be informed of the plans and strategies of the municipality relating to environmental matters.[613] Community participation forms the primary method of sourcing the local knowledge necessary for the development of LEG tools such as the IDPs, PMSs and by-laws, and could be utilised as a tool for monitoring the rendering of municipal environmental services. The obligation of a municipality to place all documents that need to be made public in terms of legislation on its official website was stressed. Despite the importance of public participation, it is currently not implemented as an effective LEG tool by municipalities.[614]

Performance management as an LEG tool was discussed next, to ensure that a municipalities plans are aligned with the IDP and being implemented to achieve the envisaged development outcomes and impacts, and that resources are being effectively and efficiently utilised.[615] Oversight over the execution of functions occurs, as the municipality must report performance against the environmental priorities, strategies and KPIs committed in the IDP. The core components of a PMS were highlighted, and it was indicated that a municipality needs to prepare an annual performance report describing the performance of the municipality, comparing targets set against the actual targets reached, and proposing measures for the improvement of performance. It was further highlighted that the individual performance measurement of the municipal manager and the senior management of a municipality must be included in their performance contracts. The performance objectives and targets set in the performance contracts must be aligned with the IDP and the organisational PMS, which has the same objective of more effective, efficient and accountable service delivery. It was proposed that targets for

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613 Refer to para 4.4.2.

614 Refer to para 4.5.2.

615 Refer to para 4.4.3.

achieving compliance with waste management legislation and policies as well as targets for mitigating the impact of climate change should be included in both the organisational and individual PMSs. A municipality must also establish a performance audit committee that could serve as an LEG tool, as the committee must review the quarterly performance audit reports, review the municipality's PMS and make recommendations to the council on improvements to be made.

The chapter next indicated that a municipality makes law in order to give effect to its Constitutional purpose, aims and objects, and to give effect to municipal policies in relation to third parties and the community it serves.[616] Environmental policy and by-laws could be employed as tools to set targets, KPIs and substantive standards, and to place duties and political commitments on the municipality in fulfilment of environmental rights and obligations. The law needs to be enforced to ensure the fulfilment of the municipality's environmental obligations, and a brief overview of by-law enforcement was given. It was stressed that non-compliance with environmental by-laws may result in the dereliction of the municipality's duties and obligations in terms of section 24 of the Constitution. The power of a municipality to establish a municipal police service and municipal courts to enforce its by-laws was elucidated.

An overview of the LEG tools available under the MFMA was provided next, and the SDBIP was dealt with first. It was indicated that the SDBIP is an action plan for the municipality's delivery of services, including environmental services, and its annual budget.[617] The SDBIP is linked to the IDP and the annual performance of the municipality and enhances the capacity of the municipality to monitor the implementation of the IDP and to react to any challenges in the implementation of the IDP.

The chapter concluded by indicating that a municipality needs to establish an internal audit unit as well as an audit committee to advise on the municipality's risk

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616 Refer to para 4.4.4.
617 Refer to para 4.5.1.

and performance management, and the effectiveness of its governance and performance.[618]

In summary, the Constitution, *Municipal Structures Act*, *Municipal Systems Act* and MFMA provide the regulatory legislative framework for local government to exercise its functions and duties relating to waste management and climate change mitigation, and furthermore provide LEG tools to monitor and evaluate the effective and efficient executions of the functions. The regulatory framework and tools form the basis for a proposed legal compliance matrix that is applied to a case study in the next chapter.

[618] Refer to paras 4.5.2 and 4.5.3.

Chapter 5: eThekwini Metropolitan Municipality climate change mitigation case study and legal compliance matrix

5.1 Introduction

In the previous chapters we analysed the legal landscape applicable to local government relating to climate change mitigation and waste management matters. In this chapter we conduct a desk-top theoretical analysis of one municipality, namely eThekwini Metropolitan Municipality (EMM), to establish to what extent the relevant legal landscape is applied and adhered to. EMM was identified for the case study as the city started to respond to climate change matters as early as in 2004, when the city initiated the development of a citywide climate change programme.[619] EMM's climate programme has prioritised the need to address the challenges of climate change risk relating of the environmental degradation and is on the forefront of climate change planning and implementation matters on a national and international level.[620]

A brief situational analysis is performed of EMM's demographics, biodiversity and economy in order to understand the dynamics, location and composition of EMM from a climate change perspective. The status of GHG emissions and waste is discussed to better understand the magnitude of the challenge EMM is facing relating to the mitigation of the impact of climate change arising from GHG emissions and waste. To strengthen the motivation for implementing climate change mitigation measures, the current impacts of climate change are reviewed in terms of increased annual mean temperature, increased and varied rainfall and the rise in sea level.

Many years ago, EMM realised the negative impact of climate change at a municipal level. It started its climate change journey in 2004. A brief history of that journey is given with a focus on the programmes developed to address the phenomenon of

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619 Roberts 2008 *Environment and Urbanization* 527.
620 Roberts and O'Donoghue 2013 *Environment and Urbanization* 300.

climate change, such as the Municipal Climate Protection Programme (MCPP), the Climate Protection Branch, the Durban Climate Change Strategy (DCCS) and the Durban Climate Action Plan (DCAP). The DCCS and the DCAP, as critical strategic climate change documents, are also discussed in more detail later in this chapter.

EMM has established numerous local and international structures and partnerships to drive the climate change initiative, and these structures and partnerships are duly considered.

As was established and indicated in previous chapters of this study, EMM has a legislative mandate to develop and adopt specific policies and by-laws to address climate change mitigation as well as the function of waste management as far as it relates to the impact on climate change. Linked to the legislative mandate to deliver services, EMM is required also to establish mechanisms or tools to monitor and evaluate compliance with the legislative mandate and the level of service delivery. The first and foremost policy document that is discussed is the IDP, as it is EMM's single, inclusive and strategic plan for the development of the municipality, setting out the vision for the municipality relating to development, operational strategies and service delivery. Linked to the IDP, the SDBIP is discussed as a monitoring tool for the service delivery projects contained in the IDP.

A legislative requirement in terms of NEM:WA is the development of an IWMP to be included in the IDP, and a check is done to measure compliance with the said provision of NEM:WA. Looking at the implementation and enforcement of the waste management function, the relevant EMM by-laws are reviewed.

It would serve no purpose to establish a number of policies, strategies and by-laws and not monitor and evaluate the implementation thereof. The chapter therefore also focusses on the tools available and implemented by EMM in monitoring and evaluating its functions and duties under climate change mitigation and waste management measures. The tools that are discussed are the PMS, section 79 oversight committees, the internal audit unit, community participation, the provision of infrastructure, and by-law enforcement.

In Chapter 4 it was indicated that public participation, community involvement and sharing information with the community were critical elements of participatory local government. Therefore, a legal compliance matrix on a strategically high level is drafted and the implementation thereof is evaluated from the perspective of a researcher, through the lens of the EMM official website,[621] indicating compliance with the requirements and gaps between the required and the available information.

5.2 Analytical methodology

The analytical methodology employed in this case study is a desk-top theoretical analysis of what should be included in a comprehensive legal and policy framework for local government to ensure that local government performs its waste management function in a mannaer that contributes towards climate change mitigation. National, provincial and local government legislation is included in the analysis. The legal framework identified will be proposed as a legal compliance matrix for climate change mitigation implementation in the waste management sector for local government, and EMM's compliance will be measured from the viewpoint of a hypothetical community member using EMM's website as primary source of information. The evaluation will be done on a quantitative basis to verify that the strategies, policies and by-laws are in place and not on a qualitative basis to establish whether the goals, targets and outcomes set in the strategies, policies and by-laws are indeed being achieved. Recommendations will be offered to augment any possible gaps identified in compliance with the legal matrix.

5.3 eThekwini Metropolitan Municipality situational analyses

5.3.1 eThekwini demographics, biodiversity and economy

eThekwini Metropolitan Municipality (EMM) (also referred to as Durban) is a Category C municipality (a metropolitan municipality) with a population of 3.7

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621 eThekwini Municipality 2011 http://www.durban.gov.za/Pages/default.aspx.

million people, situated on the south-eastern coast of the KwaZulu-Natal (KZN) province in South Africa. EMM covers 229 193 hectares (2297 km^2) and is characterised by diverse topography, ranging from high escarpments in the west of the municipality to a relatively flat coastal plain in the east, that includes urban and rural landscapes. EMM is bordered by the Indian Ocean to the east, with the warm Agulhas current providing balmy weather all year round.[622]

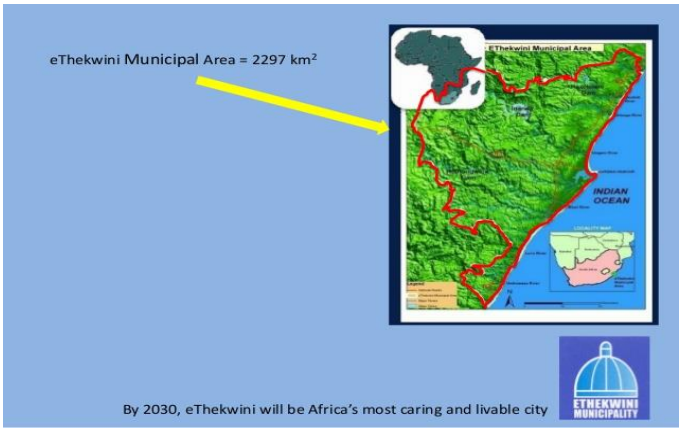

Figure 3: Location of the eThekwini Municipality[623]

EMM has a global biodiversity and is home to a high proportion of endemic animal and plant species. It encompasses savannah, forest and grassland terrestrial biomes. The natural habitat of fauna and flora have degraded over the past decades, *inter alia* due to the invasion of alien species and a general decline in biodiversity.[624] Much of the environmental degradation is as a result of human activities such as the development of the port, the growth of the multi-nodal city, and formal and informal housing developments.[625]

EMM is the largest city in KZN and the third largest city in the country, behind Johannesburg and Cape Town. The city is best known as the home of the busiest port in Africa and its main economic drivers are manufacturing (22%), finance

622 Anon 2016 https://municipalities.co.za/overview/5/ethekwini-metropolitan-municipality.
623 Gowar 2015 http://documents.pub.
624 The World Bank Group 2016 https://openknowledge.worldbank.org/handle/10986/24037 2.
625 The World Bank Group 2016 2016 https://openknowledge.worldbank.org/handle/10986/24037 3.

(22%), community services (18%), trade (16%), transport (16%), construction (3%) and electricity (2%).[626] The city has high levels of industry concentrated in the South Durban Industrial Basin, including the two biggest oil refineries in the country, which refine approximately 60% of South Africa's petroleum.[627]

5.3.2 eThekwini greenhouse gas emissions inventory

The latest greenhouse gas emissions inventory (GHDEI) for EMM, to assist with the identification of climate change strategies, was done in 2018. It identifies sources of GHS from the local government and community sectors.[628] The GHGEI indicates the emissions for the local government component including activities under the control of EMM and the community component in the municipal are. The total GHG emissions for the year 2018 was recorded at 28 804 454 tCO_2e, with the transport sector being the largest contributor (40%) and industry being the second largest contributor (32%).[629] The community component of the inventory includes emissions from industry, the commercial and residential sectors, waste and agriculture.[630] Solid waste contributed 170 138 tCO_2e emissions.[631] The local government component of the GHGEI also includes the contribution of the waste sector (solid waste facilities), with a contribution of 60 476 tCO_2e emissions.[632] The total GHG emissions in EMM decreased from 2017 to 2018 by 173 989 tCO_2e, representing a 0.8% decline. The emissions from the local government component increased from 1 261 219 tCO_2e to 1 363 657 tCO_2e, however, and the community component decreased by 276 423 tCO_2e. The assumption was made that the

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626 Anon 2016 https://municipalities.co.za/overview/5/ethekwini-metropolitan-municipality.

627 eThekwini Municipality 2019 *Durban Climate Action Plan* 5.

628 The 2010 eThekwini GHG emissions inventory is the benchmark inventory as the method to collect and report data was comprehensively defined for that specific period. Refer to eThekwini Municipality 2020 *Integrated Development Plan* 95.

629 eThekwini Municipality 2018 *Energy Office Final Summary Document: eThekwini Greenhouse Gas Emissions Inventory* 1.

630 eThekwini Municipality 2018 *Energy Office Final Summary Document: eThekwini Greenhouse Gas Emissions Inventory* 3.

631 eThekwini Municipality 2018 *Energy Office Final Summary Document: eThekwini Greenhouse Gas Emissions Inventory* 6-7.

632 eThekwini Municipality 2018 *Energy Office Final Summary Document: eThekwini Greenhouse Gas Emissions Inventory* 5.

decrease in the community component was attributable to the utilisation of cleaner fuels and a decrease in energy usage due to the use of renewable energy sources prompted by load-shedding.[633]

5.3.3 Status of waste in eThekwini

Approximately 1.5 million tonnes of commercial and residential waste are generated per year in the EMM area and disposed of at the three general waste disposal sites in Durban, namely Marianhill, Bisasar and Lovu. (Buffelsdraai landfill site was closed in 2016 after a lifespan of 35 years, and a new landfill site at Shongweni is planned.)[634] These disposal sites are operated by Durban Solid Waste. A small portion of the commercial and residential waste is recovered. Industrial waste disposal sites are operated by industry.

It is estimated that only 25% of the waste generated in informal settlements is collected and disposed of at landfill sites. 90% of the waste generated is general solid waste and the remaining 10% is made up of liquid and hazardous waste.[635]

EMM is recovering landfill gas from Bisasar and Marianhill landfill sites that generates 7.5MW of electricity per month. Although landfill gas is recovered large volumes of landfill gas are still released in the atmosphere and unused.[636]

The following key challenges are identified for the waste sector in the EMM:[637]

- EMM is experiencing increased urbanisation, resulting in population growth, resulting in increased waste volumes. Higher levels of waste lead to an increase in GHG emissions.

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633 eThekwini Municipality 2018 *Energy Office Final Summary Document: eThekwini Greenhouse Gas Emissions Inventory* 10.
634 eThekwini Municipality 2020 *Integrated Development Plan* 159.
635 *Durban Climate Change Strategy Waste and Pollution Theme Report*, 2013 2.
636 *Durban Climate Change Strategy Waste and Pollution Theme Report*, 2013 8.
637 *Durban Climate Change Strategy Waste and Pollution Theme Report*, 2013 8.

- Currently EMM is concentrating on the lower levels of the waste management hierarchy and implementing waste management strategies with a lower impact on climate change, such as waste to energy and landfilling. Efforts should be moved to waste prevention, waste minimisation and waste re-use, which would decrease the pressure on the environment and the financial and social costs of waste disposal.
- The capturing of methane emissions from landfill sites is not done to its full potential and methane is still released in the atmosphere. EMM is losing out on the additional energy supply to be derived from effective landfill gas to energy projects.

5.3.4 eThekwini waste minimisation strategies

EMM recognises the importance of waste minimisation in the protection of the environment and implements various programmes to enhance waste minimisation, educate the public and create public awareness regarding waste minimisation.[638] To achieve the vision of waste minimisation, EMM has set a goal of 50% diversion of waste from landfill in the medium term (by 2030) and 90% diversion from landfill in the long term (by 2050). EMM community programmes that aim to minimise waste are set out in Table 6.

[638] eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 61.

Table 6: EMM waste minimisation community programmes[639]

Programme	Description	Objective
Adopt a spot/ Adopt a verge/ Adopt a drain	Community members can take ownership of a small portion of land, maintain it and remove waste	Reduce illegal dumping, promote rehabilitation of land and lessen workload on EMM
Enviro-forums	Forum representing business, health organisations, community and the EMM to discuss waste management matters	Create co-ordination and effectiveness between stakeholders
Site tours	Site tours to Marianhill and Buffelsdraai landfill sites	Illustrate magnitude of waste collected and elucidate benefit of waste avoidance and minimisation
Door-to-door visits Msakhane road shows Education truck Special days Beachfront education programme NONO mascot	Training staff are deployed to promote waste minimisation and waste management	Provide education and awareness of the importance and benefits of waste minimisation and how to dispose of waste appropriately
Hammarsdale Eco Centre	Provide access for community and schools to educational resources relating to environmental matters	Educate community and scholars to utilise environmental resources in a sustainable manner.

EMM also acknowledges that recycling is a major component of waste minimisation. Its recycling initiatives programmes vary from street collection on a small-scale to large business with collection, storage and processing facilities. The orange bag kerbside collection system is EMM's primary recycling and waste minimisation project, whereby. orange bags are supplied to households to recycle cardboard, paper and plastic, and the bags are collected when the refuse is removed.[640] Clear

639 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 61-62.

640 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 83. The orange bags are transported to a processing facility at Maydon Warf operated by a private company, Mondi.

bags are provided for the collection of glass bottles and cans for recycling purposes. The advantages of separation at source are that only dry recyclable material is delivered, making the removal of each component of waste easier, that there is a higher material recovery rate directly related to disposal to landfill, and not only that wastes transported and disposed to landfill sites are cleaner, of higher sale value, but that minimal residual wastes have to be disposed of to landfill.[641] Garden transfer stations have been created where the community can deposit garden refuse, which alleviates the pressure on the general landfill sites. Drop-off centres have also been created at garden transfer stations to accept paper, cardboard, glass bottles, plastics, metal and used oil. This allows members of the community to use their own transport to take recyclable material to these centralised points.[642] EMM has created seven buy-back centres across the municipal area and recyclable material brought to these centres is weighed and bought from the community. This initiative also provides a basic income for poor community members. The weight and type of material will determine the value of money paid. The buy-back initiative results in a cleaner environment with litter being brought to the centres.[643] An average of 900 tons of recyclable paper, plastic and cardboard per month are collected by the orange bag kerbside collection programme and therefore diverts around 11000 tons of waste from landfills per year.[644] The clear bag kerbside collection initiative is still new and on average 12 tons of recyclable material are collected per month.[645] The buy-back centres have contributed to 4000 tons of recyclable material per year that was diverted from landfills.[646]

Mondi also operates a number of paper banks throughout the EMM municipal area. Refer to page 88 of the EMM IWMP for more detail. Glass recycling is done by the Glass Recycling Company, which operates 185 glass banks in the EMM municipal area. Refer to page 90 of the EMM IWMP for more detail.

641 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 138.
642 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 83.
643 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 84.
644 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 93.
645 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 94.
646 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 95.

5.3.4.1 Identified gaps in waste minimisation

The EMM has identified the following gaps relating to waste minimisation:[647]

- Not all households are receiving a weekly waste collection service;
- No guidelines are available for households on how to dispose of their waste;
- The recycling rates need to be significantly increased to meet national targets;
- The multi-bag separation at source initiative needs to be extended to the whole EMM area;
- Official coloured recycling bags need to be more accessible;
- The number of recycling drop-off centres needs to be increased and they should be placed more conveniently for the community;
- Strategies for the collection and recycling of all household goods, including e-waste, stoves, fridges, etc. need to be extended;
- Alternative treatment options need to be put in place for food wastes and garden refuse, which should be diverted from landfill sites;
- The waste management facilities need to be constantly maintained;
- The public awareness and education campaigns need to be more co-ordinated;
- A platform is needed where the public can raise waste management challenges;
- Critical vacancies in the waste management department need to be filled;
- The draft waste management by-laws need to be finalised; and
- Strategies need to be developed to prevent illegal dumping.

5.4 Climate change impact on eThekwini Metropolitan Municipality[648]

5.4.1 Increase in annual mean temperature

It is projected that the annual mean temperature of EMM will increase by 1.5°C to 2.5°C by 2065 and by up to 3°C to 5°C by 2100. As EMM becomes warmer and

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647 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 129-131.

648 Also refer to a detailed discussion on the impacts of climate change on the EMM in the 2020/1 EMM IDP at 85-94. It is worth noting that EMM participates in the working of the IPCC 202 and has an IPCC reviewer, an IPCC lead author (on the Special Report on Oceans and the

wetter, higher occurrence of heat-related and vector-borne diseases such as malaria and cholera may be experienced. Damp conditions may lead to respiratory illnesses. Higher evaporation rates will put additional strain on water resources and food will spoil faster.[649]

5.4.2 Increased and varied rainfall

The aggregate rainfall for the region is projected to increase by up to 30% (500mm) by 2100. The northern parts of EMM are expected to experience up to a 20% increase in long-duration rainfall (one day or longer) as opposed to the outer west areas, which are expected to experience an increase of up to 30% in short-duration rainfall, that may lead to flooding.[650] In some parts of the city an increase in the frequency of droughts and water shortages are expected. That would place additional stress on the water supply. Increased rainfall would result in flooding and land erosion. The waste-water treatment plants might be overloaded, resulting in untreated sewage flowing into waterways.[651]

5.4.3 Rise in sea level

EMM has 98km of highly developed coastline and is at risk of a rise in the sea level. It is expected that the sea level will rise in future at a rate of 2,5cm per decade. It is projected that storm surges, coastal storms and flooding will increase due to a rise in sea level of 2.7+-0.05mm/yr.[652]

In a climate change study commissioned by the EMM Environmental Management Department in 2007 it was predicted that, in general, climate change holds

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Cryosphere in a Changing Environment) and a Co-Chair for Working Group II (focussing on adaptation). Refer to page 86 of the 2020/2021 IDP.

649 The World Bank Group 2016 https://openknowledge.worldbank.org/handle/10986/24037 11.

650 *Durban Climate Change Strategy Waste and Pollution Theme Report*, 2013 iii.

651 The World Bank Group 2016 https://openknowledge.worldbank.org/handle/10986/24037 1 and 11.

652 The World Bank Group 2016 https://openknowledge.worldbank.org/handle/10986/24037 11.

significant challenges for EMM's social, economic and ecological sustainable development goals.[653]

5.5 eThekwini Municipality climate change law and policy: a brief history and structures

5.5.1 A brief history of EMM climate change law and policy development

Taking into account the threats of climate change to the city, in 2004 EMM developed its Municipal Climate Protection Programme (MCPP). The MCPP was developed to assist EMM to adapt to and mitigate the impacts of climate change in all the activities of the municipality. Due to its importance and its cross-cutting impact on EMM's activities, the MCPP was included in the IDP.

EMM established the Climate Protection Branch in 2006 and the Energy Office in 2008. The former is primarily responsible for initiating the adaption agenda and the latter is responsible for improving energy usage efficiency in the municipal infrastructure and initiating a mitigation mandate for the city.[654]

The EMM approved the Durban Climate Change Strategy (DCCS) in 2015, setting out the city's approach to aligning and integrating climate change adaptation and mitigation actions into the functions and operations of the city. The DCCS contains adaptation and mitigation themes as well as six flagship projects. Waste and pollution are among the mitigation focus areas. EMM is in the process of developing a comprehensive implementation plan for the DCCS.[655]

EMM hosted the Durban Local Government Convention in Durban in 2011 during COP17. [656] This led to the adoption of the Durban Adaptation Charter (DAC). The

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653 eThekwini Municipality 2007 *Climate Change: What does it mean for eThekwini Municipality* 13.
654 eThekwini Municipality 2020 *Integrated Development Plan* 88.
655 eThekwini Municipality 2020 *Integrated Development Plan* 88.
656 eThekwini Municipality 2020 *Integrated Development Plan* 92.

DAC commits local government inter alia the following principles applicable to mitigation practices:[657]

1. Understanding climate risks through conducting impact and vulnerability assessments;
2. Preparing and implementing integrated, inclusive and long-term local strategies designed to reduce vulnerability;
3. Ensuring that adaptation strategies are aligned with mitigation strategies
4. Prioritising the role of functioning ecosystems as core municipal green infrastructure;
5. Seeking the creation of direct access to funding opportunities;
6. Developing an acceptable, robust, transparent, measurable, reportable and verifiable (MRV) register;
7. Promoting multi-level and integrated governance and advocating for partnerships with sub-national and national governments on local climate action;
8. Promoting partnerships at all levels and city-to-city cooperation and knowledge exchange.

EMM recognises in its IDP that South Africa is a signatory to the *Paris Agreement* and as such it is also committed to limiting temperature rises to 1.5^{o}C above pre-industrial levels, combatting the impact of climate change, and accelerating and intensifying its actions and investments to build a sustainable carbon future. EMM is currently implementing more than fifty mitigation projects.[658]

EMM has developed a climate action plan for the DCCS that will comply with the vision of limiting global temperature rise to no more than 1.5^{o}C and that will be in line with South Africa's NDC for the *Paris Agreement*.[659] EMM is currently busy with the development an integrated implementation plan for the DCCS that will incorporate existing climate change work, identify any gaps, and encompass all information in an integrated climate change programme.[660]

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657 *Durban Adaptation Charter*, 2011 2-3.
658 eThekwini Municipality 2020 *Integrated Development Plan* 306-307.
659 eThekwini Municipality 2020 *Integrated Development Plan* 89.
660 eThekwini Municipality 2020 *Integrated Development Plan* 90.

5.5.2 EMM Climate Change Structures and partnerships

5.5.2.1 The DCCS Secretariat

The DCCS establishes the DCCS Secretariat, consisting of the Climate Protection Branch and the Energy Office, that cover both the adaptation and mitigation efforts of the city. An eThekwini Municipality Climate Change Committee, under the leadership of the executive mayor, was established to provide political oversight of the implementation of the DCCS. A DCCS Technical Task Team under the leadership of the municipal manager was established to monitor the implementation of the DCCS. It consists of all head of departments, the object of the inclusivity being to ensure the implementation of the DCCS across all functions of the EMM. The DCCS Technical Task Team is supported by sub-committees consisting of deputy heads of department and senior managers, and is responsible for the physical implementation of the DCCS.[661]

5.5.2.2 Performance Monitoring and Evaluation Unit

The Performance Monitoring and Evaluation Unit is responsible for the evaluation and monitoring of the performance of the organisation as well as for the employees of the EMM.[662] The Unit monitors the KPIs of projects and programmes to ensure that the EMM reaches the goals set in the IDP. The SDBIP is utilised as the tool to monitor the progress of actual service delivery and the budget spent on projects and programmes.[663]

5.5.2.3 Durban Research Action Partnership

EMM has formed a research action partnership with the University of KwaZulu Natal (UKZN), known as the Durban Research Action Partnership (DRAP), to develop the necessary knowledge to guide projects by improving the understanding of

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661 eThekwini Municipality 2020 *Integrated Development Plan* 89.
662 eThekwini Municipality 2020 *Integrated Development Plan* 282.
663 eThekwini Municipality 2020 *Integrated Development Plan* 282.

ecological infrastructure. The aim of DRAP is to improve land-use management decisions for climate change adaptation and mitigation, by quantifying the ecological impacts of climate change, understanding the socio-economic benefits of ecosystem-based services, and understanding the role of ecological infrastructure in climate change and the conservation of EMM's biodiversity.[664]

5.5.2.4 International Council for Local Environmental Initiatives (ICLEI)

EMM is a member of ICLEI, a global network of 1500 cities committed towards building a sustainable future and addressing climate change matters by shaping policy development and encouraging action in support of the transformation of urban centres.[665] Five strategic pathways were identified for implementation, including actions promoting low carbon emissions, resilient development, circular development, equitable and people-centred development, and nature-based development.[666]

5.5.2.5 The C40 Network

EMM is one of 96 global cities that are members of the C40 Network, which focusses on climate change matters such as reducing climate risk and GHG emissions whist addressing socio-economic issues such as ensuring the health and wellbeing of their citizens. The C40 Network promotes the sharing of global expertise on climate change actions and has taken a specific initiative on solid waste, giving attention to sustainable solid waste systems and using waste as a resource.[667] As part of this initiative, a number of measures to mitigate the impacts of climate change and reduce GHG emissions have been implemented by EMM, such as the 100 Resilient Cities Pilot Project – Take Back Our Rivers Pilot Project (Aller River),[668] the Durban

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664 eThekwini Municipality 2020 *Integrated Development Plan* 91.
665 eThekwini Municipality 2020 *Integrated Development Plan* 360.
666 eThekwini Municipality 2020 *Integrated Development Plan* 361.
667 eThekwini Municipality 2020 *Integrated Development Plan* 359.
668 The project restores the health of selected rivers through rehabilitation and restoration strategies.

Energy Office Solar Project[669] and the C40 Good Practice Guides:[670] Durban - Buffelsdraai Landfill closed loop system.[671]

5.5.2.6 Cities Fit for Climate Change

Cities Fit for Climate Change is a global project supporting cities towards building a low-carbon, climate-proof urban development model that will mitigate the negative impact of climate change.[672] The implementation of this model will ensure that all urban development strategies, urban design, master plans and land-use plans will be able to adapt to the current and future impacts of climate change and will be resilient to climate change.[673]

5.6 eThekwini climate change policy documents

5.6.1 Integrated Development Plan

As indicated in paragraph 4.4.1, each municipality must adopt an IDP that is a single, inclusive and strategic plan for the development of the municipality, and which sets out the vision of the municipality regarding development, operational strategies and service delivery. EMM adopted its IDP in 2017 as its five-year strategic development plan[674] with the vision that "By 2030, EThekwini will enjoy the reputation of being Africa's most caring and liveable City where all citizens live in harmony."[675] Climate change is identified as one of the development challenges for the municipality[676] and is addressed in section 1.5 and 1.6 of the IDP.[677] The

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669 The project aims to ensure that 40% of Durban's electricity demand is supplied through renewable energy by 2030, by the implementation of small-scale renewable energy generation projects such as rooftop solar power in municipal buildings and assets.

670 This project focusses on improving waste management processes and is managed as a closed loop system. The project at Buffelsdraai landfill site has created benefits such as reducing GHG emissions, generating renewable energy and contributing to poverty alleviation.

671 eThekwini Municipality 2020 *Integrated Development Plan* 359-360.

672 eThekwini Municipality 2020 *Integrated Development Plan* 360.

673 eThekwini Municipality 2020 *Integrated Development Plan* 360.

674 eThekwini Municipality 2020 *Integrated Development Plan* 1.

675 eThekwini Municipality 2020 *Integrated Development Plan* 8.

676 eThekwini Municipality 2020 *Integrated Development Plan* 9.

677 eThekwini Municipality 2020 *Integrated Development Plan* 85-105.

IDP ensures alignment with the principles of the *Paris Agreement* and is the main point of reference for climate change matters in the city.[678] The function of solid waste management is identified as one of the sectors that contributes to GHG emissions.[679] EMM recognises that all the solid waste that is generated is being disposed of at landfills and identifies the IWMP as the primary intervention aimed at optimising waste management in the municipality by increasing the efficiency of the service.[680] The IDP includes the objective of significantly increasing the rates of recycling and re-use by extending the multi-bag separation-at-source programme to all areas where it is feasible.[681] Over 90 000 tons of waste were recycled in the year 2019-2020, which represents 10% of the total waste. A target of 8% was initially set for the year.[682] EMM also sets a target of developing an environment contributing to the minimisation of GHG emissions and enhancing resource efficiency to limit EMM's impact on climate change. It is mentioned that EMM is in the early peak trajectory, due to EMM's high per capita GHG emissions.[683]

EMM requires the inclusion of climate change matters in environmental assessment and especially environmental impact assessments. An EIA is viewed as an environmental management tool to ensure sustainable development by taking the impacts of the activity under consideration on climate change into account when considering an application for land use. An EIA can therefore assist with mitigating the impact of a development on climate change by including requirements to change the design of the development to accommodate potential climate change impacts.[684]

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678 eThekwini Municipality 2020 *Integrated Development Plan* 306-307.
679 eThekwini Municipality 2020 *Integrated Development Plan* 96.
680 eThekwini Municipality 2020 *Integrated Development Plan* 322.
681 eThekwini Municipality 2020 *Integrated Development Plan* 322.
682 eThekwini Municipality 2019-2020 *Annual Report* 85.
683 eThekwini Municipality 2020 *Integrated Development Plan* 323.
684 eThekwini Municipality 2020 *Integrated Development Plan* 83.

5.6.2 eThekwini Municipality Service Delivery and Budget Implementation Plan

The SDBIP for EMM was approved by the Executive Mayor on 17 June 2021 and serves as a monitoring tool for the service delivery projects contained in the IDP. The EMM climate change response plan is contained under the title "Develop and sustain our spatial, natural and built environment". It sets the following three KPIs:

- Development of the city's sustainable and resilience plan to direct the city's planning processes to promote environmental sustainability and resilience and include environmental matters in strategic spatial planning;[685]
- Prepare a Durban Metropolitan Open Space System and Finescale Systematic Conservation Planning to guide development and protect biodiversity priority areas;[686]
- Produce an annual report on the implementation of the DAC;[687]
- Produce an annual report on the implementation of the DCCS;[688]
- Complete the 2020 (calendar year 2022) GHG emissions inventory for the EMM.[689]

In terms of the SDBIP implementation plan quarterly report as at 31 December 2021, all the KPI's planned under the title "Develop and sustain our spatial, natural and built environment" were achieved.[690]

Waste Management is contained under the title "Creating a quality living environment" and sets the following KPIs:

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685 eThekwini Municipality 2021/2022 SDBIP 5.
686 eThekwini Municipality 2021/2022 SDBIP 6.
687 eThekwini Municipality 2021/2022 SDBIP 8.
688 eThekwini Municipality 2021/2022 SDBIP 8.
689 eThekwini Municipality 2021/2022 SDBIP 8.
690 eThekwini Municipality 2021/2022 SDBIP Implementation Plan Quarter 2 Report 3

- Address infrastructure backlogs and ensure that all households have access to a basic level of refuse removal service once a week;[691]
- Waste recycled and diverted from municipal landfill sites to be increased to a certain percentage.[692]

In terms of the SDBIP implementation plan quarterly report as at 31 December 2021, 83.33% of the KPI's under the title "Creating a quality living environment" were achieved.[693]

5.6.3 eThekwini Municipality Integrated Waste Management Plan 2016-2021

The NEM:WA *inter alia* requires an IWMP to:

- Set out priorities and objectives for waste management;
- Establish targets for the collection, minimisation, re-use and recycling of waste;
- Set out the approach to planning any new facilities for the disposal and decommissioning of existing waste disposal facilities;
- Indicate the financial resources required; and describe the implementation mechanisms for the IWMP.[694]

In compliance with the NEM:WA, EMM compiled an IWMP addressing all the required components in various sections of the IWMP. EMM sets the provision of efficient and effective waste collection services that will significantly contribute to a healthy and safe environment as one of its ultimate objectives for waste management.[695] A further objective is to minimise the disposal of waste to landfill by maximising the separation at source of recyclable material, diverting organic waste (waste foodstuff and garden waste) from the waste stream to maximise benefits through alternative treatment methods, to reduce the quantity of residual waste for landfill disposal and to implement financially feasible alternatives for the

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691 eThekwini Municipality 2021/2022 SDBIP 26.
692 eThekwini Municipality 2021/2022 SDBIP 27.
693 eThekwini Municipality 2021/2022 SDBIP Implementation Plan Quarter 2 Report 3
694 Refer to para 3.3.7.
695 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 133.

treatment of contaminated recyclable and non-recyclable materials.[696] EMM comprehensively sets out goals for the collection, minimisation, re-use and recycling of waste[697] linked to an implementation plan,[698] including estimated budgets. The targets are contained under seven principle goals which can be summarised as follows:

Goal 1: Waste generation and waste collection[699]

- Provide viable comprehensive waste collection service to all areas;
- Update waste stream data on the types and quantity of waste generated in the business, industrial and residential areas;
- Reduce illegal dumping.

Goal 2: Recycling and re-use[700]

- Reduction of waste disposal to landfill by 10% per annum by systematically increasing recycling and re-use by the municipality and the private sector;
- Make recycling convenient for all sectors by increasing the availability of separation at source bags and buy-back centres;
- Divert white goods (fridges, stoves, etc.) and e-waste from the waste stream and disposal at landfill to recycling.

Goal 3: Waste treatment and disposal[701]

- Ensure the safe disposal of general waste by ensuring the legal compliance of landfill sites;
- Reduce waste disposed at landfill sites by implementing advanced waste treatment facilities, such as composting facilities and waste-to-energy facilities (anaerobic digesters and thermal processes).

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696 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 134.
697 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 145-154.
698 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 156-173.
699 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 157-158.
700 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 159-162.
701 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 163-166.

Goal 4: Maintenance and improvement of waste management facilities[702]

- Ensure occupational health and environmental legislation compliance of all waste management facilities to minimise the impact on the environment.

Goal 5: Public awareness and education[703]

- Increase education and public awareness regarding recycling, waste management and illegal dumping.

Goal 6: Management systems, human resources and finance[704]

- Implement an environmental management system;
- Ensure sufficient staffing levels and the continuous development of staff;
- Provide adequate funding to deliver an effective and efficient waste management service and to reach the objectives and goals of the IWMP.

Goal 7: Legislation, compliance, monitoring and enforcement[705]

- Update, publish and enforce new waste management by-laws;
- EMM and external contractors must comply with all waste management licences and legislation relating to employment, health and safety, and the environment.

5.6.4 eThekwini Municipality waste removal By-laws[706]

EMM has adopted waste removal by-laws *inter alia* to regulate the collection and removal of business and domestic waste, to ensure the effective and efficient delivery of waste services, and to manage and promote the recycling of waste.[707] The by-laws make provision for a once-a-week waste collection service[708] and

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702 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 167.
703 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 168-169.
704 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 170-171.
705 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 172-173.
706 eThekwini Municipality *Waste Removal By-laws* 2016 MN 117 KNPG dated 25 August 2016.
707 Section 3 of the eThekwini *Waste Removal By-laws*.
708 Section 5 of the eThekwini *Waste Removal By-laws*.

regulate the waste containers and storage areas for waste.[709] Sections 17 and 18 of the by-laws provide that garden refuse must be disposed of at special garden refuse sites against the payment of a tariff. The by-laws regulate the recycling, re-use, sorting and reduction of waste to ensure that operators submit an EIA and a waste management plan, and indicate compliance with the regulatory framework set by the municipality to show that recycling, re-use or reduction of waste will have a less harmful impact on the environment than disposal.[710] Chapter 12 of the by-laws sets out the provisions for the enforcement of the by-laws and chapter 13 determines offences and penalties. Effetive implementation of the by-laws would contribute to a reduction of waste and contribute to climate change mitigation.

5.6.5 Durban Climate Change Strategy

The DCCS[711] provides a background to climate change and EMM's GHG emissions, which have already been discussed earlier in this study.[712] EMM states that its climate change mitigation measures aim to reduce GHG concentrations in the atmosphere in order to permanently eliminate or reduce the long-term risks of climate change to human health, property and the environment.[713] Although the main focus of mitigation actions is the energy sector, EMM[714] also addresses other themes such as sea level rise, biodiversity, water, food security, health, **waste** and pollution *(own emphasis)*, transport, economic development, and knowledge management.[715]

The DCCS vision is:

> To transform Durban's governance, social, development and economic systems in order to effectively respond to climate change.[716]

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709 Sections 6 to 8 of the eThekwini *Waste Removal By-laws*.
710 Section 40 of the eThekwini *Waste Removal By-laws*.
711 eThekwini Metropolitan Council 2014 *Durban Climate Change Strategy*.
712 Refer to Chapter 2 and point 5.2.2.
713 DCCS 7.
714 DCCS 7.
715 DCCS 15-24.
716 DCCS 14.

The DCCS mission is as follows:

> By 2020 there must be a fundamental change in Durban's governance, social, development and economic systems in order to contribute to the goal of limiting global average temperature increase to less than 2°C, minimising dangerous climate change and adapting to climate change impacts. This will be achieved by increasing the adaptive capacity of the City, enhancing the integrity of the City's environment and building a low carbon economy that provides sustainable livelihood opportunities and ensures well-being for all. All organisations and residents of Durban should be empowered to respond to climate change causes and its impacts.[717]

EMM acknowledges the low GHG emissions from the waste sector, but that the waste sector could potentially contribute to large reductions of GHG emissions. The DCSS reiterates that EMM has effective solid waste management systems which aim to reduce, re-use and recycle waste, to divert waste from landfill sites, and to reduce GHG emissions.[718]

5.6.6 Durban Climate Action Plan

The DCAP[719] acknowledges that EMM is already experiencing the impact of climate change as on 22 April 2019 the city experienced more than 200mm of rainfall in 24 hours, causing wide-spread and disastrous flooding in the city and the province.[720] In response to these events, EMM has developed the DCAP that builds on the DCCS, containing a city-wide climate action plan to limit the temperature increase to 1.5°C. The DCAP is an action plan to transition EMM towards climate resilience and carbon neutrality by 2050.[721] EMM aims for a 40% reduction in emissions from a 2015 baseline by 2030 and a 80% reduction by 2050 and has committed to identifying opportunities to achieve carbon neutrality, such as generating carbon offset, when a National Carbon Tax is implemented.[722]

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717 DCCS 14.
718 DCCS 21.
719 eThewkini Municipality 2019 *Durban Climate Action Plan 2019.*
720 DAPC 2019 2.
721 DCAP 2019 4.
722 DCAP 2019 4.

The DCAP identifies the EMM Climate Change Committee and its Technical Task Team as effective platforms to provide policy to include the theme of climate change across all departmental plans.[723] These structures could:

- Enable cross cutting and integrated climate responses through a transversal management approach;
- Integrate climate change into departmental strategies and implementation plans;
- Facilitate resources and capacity for implementation actions;
- Monitor progress on mitigation actions and targets;
- Include climate change KPIs in the PMS;
- Facilitate external stakeholder engagement for support.[724]

The DCAP requires that the following actions be taken to strengthen climate change governance in EMM:[725]

- Mandate the EMM Climate Change Committee and Technical Task Team to implement climate change activities throughout the municipality;
- The Technical Task Team should resort under the deputy city manager to ensure senior management level support;
- KPIs to be developed for each sector-department;
- Establish departmental cooperation with implementation of climate change actions;
- Institutionalise the DCAP in all EMM strategic documents, such as the IDP, SDBIP and SDF;
- Include climate change criteria in all capital projects;

723 DCAP 2019 14.
724 DCAP 2019 14-15.
725 DCAP 2109 16.

- Implement a climate change communication strategy;
- Review the location of the climate change function in city governance structure to ensure optimal utilisation;
- Build capacity relating to the understanding of climate change amongst officials and councillors;
- Strengthen community engagement and participation to enhance adaptive governance;
- Include the GHG inventory I policy and implementation plans to track the progress of climate change actions;
- Include climate change as a risk in the Enterprise Risk Management System to integrate climate change actions and risks into various line functions; and
- Develop and implement a green procurement policy to take climate change and environmental matters into account.

5.7 eThekwini climate change monitoring and evaluation tools

5.7.1 Performance agreement and performance plan for the Municipal Manager and senior management

EMM entered into a performance agreement, linked to a performance plan, with the municipal manager for the 2021/2022 financial year. The municipal manager must ensure the implementation of the IDP and other policies of the municipality especially the functions of planning for protection against climate change, the development and sustenance of the natural environment, and the delivery of basic services to the community, such as waste management services.[726] The performance agreement provides for a performance management system setting KPIs, performance standards and timeframes in which to achieve the objectives of the EMM IDP, the SDBIP and the budget.[727] The agreement also provides for a

[726] eThekwini Municipality 2021-2022 *City Manager Performance Plan* 3.
[727] Sections 4 to 7 of the eThekwini Municipality 2021-2022 *City Manager Performance Agreement*.

possible performance bonus in the event of outstanding performance and the termination of the employment contract in the event of sub-standard performance.[728] Similarly, EMM entered into a performance contract on the same terms and conditions as with the municipal manager with the deputy city manager, who is responsible for the trading services cluster and the functions of climate change and waste management.[729]

5.7.2 Section 79 Oversight Committees

The EMM Council holds the executive and legislative power of the municipality and is the final decision-making authority of the municipality on matters relating to service delivery to its communities.[730] However, EMM established the following Section 79 Committees with the powers and functions assigned to them to assist the municipal council with service delivery:

5.7.2.1 Human Settlements and Infrastructure Committee

This committee makes recommendations to the executive mayor and council on all matters relating to basic services, including waste management and water and sanitation.[731]

5.7.2.2 Climate Change Committee

The climate change committee is responsible to the executive mayor for oversight on the EMM's measures to address climate change actions and the implementation of the DCCS that addresses both climate adaptation and mitigation measures.[732]

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728 Section 11 of the eThekwini Municipality 2021-2022 *City Manager Performance Agreement*.
729 Sections 5 to 9 of the eThekwini Municipality 2021-2022 *Deputy City Manager Trading Services Cluster Performance Agreement*.
730 eThekwini Municipality 2019-2020 *Annual Report* 395.
731 eThekwini Municipality 2019-2020 *Annual Report* 396.
732 eThekwini Municipality 2019-2020 *Annual Report* 396.

5.7.2.3 Audit Committee

The audit committee advises council, the executive mayor and the municipal manager on internal financial policies and control, the reliability of financial reporting, performance management and performance evaluation, good governance, enterprise risk management and legislative compliance.[733]

5.7.2.4 Municipal Public Accounts Committee

This committee assists council to hold the administration of the municipality accountable for service delivery and sound financial and asset management to ensure the effective and efficient use of council resources.[734]

5.7.3 Internal audit unit

The EMM internal audit unit is an independent unit with the aim of assisting the municipality to improve its operations and deliver the outcomes set in the IDP, by evaluating good governance, risk management and the internal controls, supporting the EMM's vision of "making eThekwini the most caring and liveable city by 2030."[735] The unit engages in all operational matters of the municipality and renders support to all the oversight structures of the municipality.[736]

5.7.4 Community participation

The EMM has established a community participation unit to facilitate citizen participation and stakeholder engagement in municipal decision-making processes such as the IDP and policy-making processes. The unit enables and activates

733 eThekwini Municipality 2019-2020 *Annual Report* 398.
734 eThekwini Municipality 2019-2020 *Annual Report* 395.
735 eThekwini Municipality 2019-2020 *Annual Report* 36.
736 eThekwini Municipality 2019-2020 *Annual Report* 37.

community structures to make meaningful contributions towards improving the quality of life of citizens.[737]

5.7.5 Provision of infrastructure

The Department of Cleansing and Solid Waste provides comprehensive waste management services. The Department's business operations include 32 operational centres, 7 transfer stations, 3 landfill sites, 22 recycling plants, 3 landfill gas projects and 2 leachate plants. EMM is busy of establishing a new landfill site at Shongweni to service the community in the outer west regions.[738]

5.7.6 By-law enforcement

The Durban Metropolitan Police Service is one of the departments of the EMM and is tasked with law enforcement within the boundaries of EMM. The aim of the said department is to ensure a safe, secure and healthy environment.[739] Although crime is of primary concern, the department is also responsible for the enforcement of EMM's by-laws, which include its waste management by-laws.[740]

5.8 Legal Framework compliance matrix

Legal framework	**Legal requirements**	**EMM Compliance**		**Comments/observations**
		Yes	**No**	
Paris Agreement	*Article 2(1)(a)* "keep the increase in the global average temperature to well below 2°C above pre-industrial levels and limit the temperature	Yes		EMM acknowledges and commits to this objective in the IDP,[741] DCCS[742] and the DCAP[743]

737 eThekwini Municipality 2019-2020 *Annual Report* 49.
738 eThekwini Municipality 2019-2020 *Annual Report* 85.
739 eThekwini Municipality 2019-2020 *Annual Report* 291.
740 eThekwini Municipality 2019-2020 *Annual Report* 293.
741 eThekwini Municipality 2020 *Integrated Development Plan* 86 and 306-307.
742 DCCS 14.
743 DCAP 2019 4.

	increase to 1,5°C above pre-industrial levels".			
	Article 4(1) "GHG emissions to peak as soon as possible and to achieve zero-emissions in the second half of the century."	Yes		EMM commits to the peak, plateau and decline trajectory in the IDP[744] and the DCAP.[745]
	Article 4(2) Set nationally determined contributions (NDC) as a requirement for mitigation and revise the NDCs every 5 years.	Yes		Local NDCs set in DCAP. EMM aims at 40% reduction in emissions from 2015 baseline and 80% reduction by 2050 to achieve carbon neutrality[746]
Constitution	*Section 24* "Everyone has the right- (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that- (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure the ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	Yes		Refer to the core development matrix in the IDP.[747]
National Climate Change Response	Give priority to cost-effective and beneficial mitigation policies facilitating the achievement	Yes		The IDP, DCCS, DCAP, by-laws and IWMP addressing the mitigation policies are in place.

744 eThekwini Municipality 2020 *Integrated Development Plan* 53.
745 DCAP 2019 42-44.
746 DCAP 2019 4.
747 eThekwini Municipality 2020 *Integrated Development Plan* 669-675.

White Paper *(Para 4.2)*	of the peak, plateau and decline principle, where the peak of GHG emissions should be reached between 2020 and 2025, plateau for about 10 years and thereafter decline in absolute terms			
	Climate change response strategies must be implement and reported on by all sectors to reach the National Climate Change Response Objective	Yes		The implementation of climate change response and waste management is reported in the IDP and Annual Report.
	Intervention strategies relating to the climate change response should be aligned with those on all government levels	Yes		Alignment of projects and goals summarised in the IDP.[748]
	Climate change considerations and responses must be included and aligned with all government planning and must be included in the municipal IDP	Yes		Alignment of projects and goals is summarised in the IDP.[749] There is alignment between planning instruments such as the IDP, the SDBIP and the Annual Report.[750]
	The necessary resources to implement the climate change responses should be provided			
Climate Change Bill	*Section 7* By-laws and policies aligned to national and provincial laws and policies to give effect to national climate change adaptation and mitigation objectives			Alignment of projects and goals summarised in the IDP.[751]
	Section 9 Address climate change needs through the development and implementation of a climate change response implementation plan.			DCCS and DCAP developed and in place.

748 eThekwini Municipality 2020 *Integrated Development Plan* 679-683.
749 eThekwini Municipality 2020 *Integrated Development Plan* 679-683.
750 eThekwini Municipality 2020 *Integrated Development Plan* 675-685.
751 eThekwini Municipality 2020 *Integrated Development Plan* 679-683.

	Section 11(1) Set a GHG emissions trajectory	Yes		EMM has a GHG emissions inventory[752] and addresses the emissions trajectory in the IDP[753] and DCAP.
	Section 12(1) Sector-specific targets for GHG emissions set	Yes		Targets set in the DCAP.[754]
	Section 12(6) Sector-specific targets for GHG emissions included in planning cycles			
	Section 12(7) Sector-specific targets for GHG emissions monitored and reported to Presidency	Yes		Monitoring and evaluation framework addressed in DCAP.[755]
NEMA	*Section 2(4)(a)(i) and (ii)* Avoid or minimise environmental degradation such as ecosystem disturbance, biological diversity loss and pollution	Yes		Actions to avoid or minimise impact on the environment addressed in the DCAP.[756]Biodiversity protected by biodiversity planning branch and policies.[757]
	Section 2(4)(iv) "Waste must be avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner".	Yes		Waste minimisation strategies contained in the IWMP.[758] Effective waste management systems to reduce, re-use and recycle waste to divert waste from landfill and reduce GHG emissions addressed in DCCS.[759]
	Section 23 Environmental impact assessments used to ensure integrated environmental activities monitor and evaluate the impact on the environment and socio-economic circumastances	Yes		EMM requires inclusion of climate change matters in EIAs[760] Biodiversity impact assessments assessed by EMM.[761]

752 See para 5.3.2.
753 eThekwini Municipality 2020 *Integrated Development Plan* 323.
754 DCAP 2019 34-65.
755 DCAP 2019 80-82.
756 DCAP 2019 18-65.
757 eThekwini Municipality 2019-2020 *Annual Report* 243-247.
758 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 60-132.
759 DCCS 21.
760 eThekwini Municipality 2020 *Integrated Development Plan* 83.
761 eThekwini Municipality 2019-2020 *Annual Report* 246-247.

NEM:WA	*Section 4(a)* IWMP adopted	Yes		EMM adopted a five-year IWMP in 2016
	Section 12(1)(b) IWMP must *inter alia* provide implementation of waste minimisation, re-use, recycle and recovery goals and programmes. IWMP must be aligned with South Africa's obligations in respect of relevant international agreements	Yes		The EMM IWMP provides for efficient and effective waste collection services that will significantly contribute to a healthy and safe environment.[762]
	Section 4(a)(ii) IWMP must be included in the IDP		No	Mention is made of the IWMP in the IDP, but the plan is not included[763]
	Section 9(2) Waste management services including waste collection, waste storage and waste disposal services must be included included in the IDP	Yes		Waste management services included in IDP[764]
	Section 13(4) The Annual Report must include the implementation of the IWMP	Yes		The implementation of the different components of the IWMP is addressed in the Annual Report[765]
	Section 73 Public participation process followed in finalising IWMP and comments and inputs considered	Yes		Stakeholder engagement was done and comments and inputs are contained in the IWMP. Extensive public awareness campaigns undertaken[766]
	Section 9(1) Waste management services, including waste removal, waste storage and waste disposal services, must be delivered within the norms and standards set by national and provincial government	Yes		Waste management services are delivered.[767]

762 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 133.
763 eThekwini Municipality 2020 *Integrated Development Plan* 723.
764 eThekwini Municipality 2020 *Integrated Development Plan* 85 and 322-323.
765 eThekwini Municipality 2019-2020 *Annual Report* 85-90.
766 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 125-126 and 61-62.
767 eThekwini Municipality 2020 *Integrated Development Plan* 50; eThekwini Municipality 2021/2022 SDBIP 26-27; eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 157-173; eThekwini Municipality *Waste Removal By-laws*.

	Section 9(3) Local waste management services norms and standards such as the regulation of waste disposal facilities, the avoidance and minimisation of the generation of waste, the re-use, recycling and recovery of solid waste and the direction of waste to specific waste treatment and disposal facilities set must be set.		No	Waste removal By-laws in place, but not addressing all the required matters.
National Domestic Waste Collection Standards, 2011 **Waste Classification and Management Regulations, 2013** **National Norms and Standards for the Disposal of Waste to Landfill, 2013** **National Waste Information Regulations, 2012** **National Norms and Standards for the Assessment of waste for landfill**	*Due to the technical nature of these regulations, they are not evaluated from a legal perspective and a separate legal compliance report should be developed by the responsible line department. It could, however, be deduced that there is a substantial element of compliance, but that:* - *not all the landfill sites of the EMM are fully licensed;*[768] - *not all households receive waste collection services;*[769] - *there is no practical guidance for rural households to safely and legally dispose of waste;*[770] - *the EMM waste stream analysis is outdated;*[771] *and* - *a waste management officer needs to be appointed in terms of the NEM:WA.*[772]			

768 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 129.
769 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 127.
770 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 128.
771 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 127.
772 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 131.

disposal, 2013				
National Norms and Standards for the Storage of Waste, 2013				
National Waste Management Strategy, 2020	*Pillar 1: Waste Minimisation* "40% of waste diverted from landfill within 5 years; 55% within 10 years; and at least 70% within 15 years leading to zero waste going to landfill".	Yes		EMM has set a goal of 50% diversion of waste from landfill in the medium term (by 2030) and 90% diversion from landfill in the long term (by 2050)[773]
	Pillar 2: Effective and Sustainable Services "EMM communities live in clean communities with waste services that are well managed and financially sustainable".	Yes		The IDP addresses as a KPI the creation of a quality living environment.[774]
	Pillar 3: Compliance, Enforcement and Awareness Mainstreaming of waste awareness and a culture of compliance resulting in zero tolerance of pollution, litter and illegal dumping	Yes		Chapter 12 of the EMM waste removal By-laws deals extensively with the enforcement, offences and penalties to serve as incentives and disincentives.
Municipal Structures Act	*Section 83(2)* Does EMM perform the functions of climate change mitigation and waste management	Yes		Refer to the IDP on climate change from pages 85-96 and waste management on page 170. Refer to pages 85 to 90 of the Annual Report for the function of waste management and pages 257 to 262 for the function of climate change.
	Section 83(2) Is comprehensive infrastructure provided to render the services of climate change and waste management	Yes		A Department Waste and Sanitation, an Energy Office and an EMM Climate Change Committee are in place, supported by a Technical Task Team.[775] Business operations

773 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 61-62.
774 eThekwini Municipality 2020 *Integrated Development Plan* 486-521.
775 eThekwini Municipality 2019-2020 *Annual Report* 49.

				and infrastructure are detailed in the Annual Report.[776] Infrastructure is set out in detail in the IWMP.[777]
	Section 56 Strategies, programmes and policies in place to address climate change and waste management	Yes		Climate change mitigation and waste management are addressed in the following documents: IDP, SDBIP, DCCS, DCAP, IWMP, waste removal by-laws.
	Section 79 Established and functioning section 79 portfolio committee relating to climate change and waste management			EMM established the following Section 79 oversight committees relating to climate change and waste management:[778] Human settlements and Infrastructure Climate Change Committee Audit Committee. Climate change committee and technical task team also established. Also refer to the Annual Report for committees.[779]
	Section 79A Established and functioning MPAC considering climate change and waste management matters	Yes		MPAC Committee established and functional[780]
Municipal Systems Act	*Section 11(3)* Develop and promulgate climate change and waste management by-laws	Yes		Waste by-laws adopted.[781]
	Section 25 Develop and adopt an IDP	Yes		IDP in place.[782]
	Section 26 IDP complies with required core components	Yes		MEC responsible for local government evaluated IDP and confirmed core components.[783]
	Section 16(1)	Yes		IWMP stakeholder engage-ment.[784] DCAP established Sisonke community participation

776 eThekwini Municipality 2019-2020 *Annual Report* 85.
777 eThekwini Municipality 2020 *Integrated Development Plan* 63-112.
778 Refer to para 5.7.2.
779 eThekwini Municipality 2019-2020 *Annual Report* 27-30.
780 Refer to para 5.7.2.4.
781 eThekwini Municipality 2016 *Waste Removal By-laws* MN 117 KNPG dated 25 August 2016.
782 eThekwini Municipality 2020 *Integrated Development Plan* 1.
783 eThekwini Municipality 2020 *Integrated Development Plan* 703-708.
784 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 125-127.

	System of public participatory governance established			programme.[785] EMM established a community participation unit to facilitate citizen participation and stakeholder engagement.[786]
	Regulation 15(1)(a) of the Municipal Planning and Performance Regulations IDP Representative Forum established and functioning		No	No formal IDP Representative Forum established. Community participation unit facilitates citizen participation and stakeholder engagement
	Section 21A IDP, PMS, policies, by-laws and other climate change and waste management-related documents placed on the official website	Yes		Refer to the online tools, publications and resource centre on EMM official website[787]
	Section 38 PMS developed addressing priorities, objectives, indicators and targets as contained in the IDP relating to climate change and waste management	Yes		Climate change and waste management included in the municipal manager's performance agreement[788] and in the PMS.[789] Performance Monitoring and Evaluation Unit established to monitor PMS.[790]
	Section 41 PMS contains core components as required by legislation	Yes		PMS in place.[791] Auditor general in its report verified core components.[792] The Annual performance report also confirms compliance with core components.[793]
	Section 55 Administration and staff component established for functions of climate change and waste management	Yes		Energy Office and climate protection branch responsible for climate change matters.[794] Department of Sanitation and Waste established for waste management function.[795]

785 DCAP 2019 73-77.
786 eThekwini Municipality 2019-202 *Annual Report* 49-50.
787 eThekwini Municipality 2011 http://www.durban.gov.za/Resource_Centre/Pages/default.aspx.
788 Sections 4 to 7 of the eThekwini Municipality 2021-2022 *City Manager Performance Agreement*.
789 eThekwini Municipality 2020 *Integrated Development Plan* 673-675.
790 eThekwini Municipality 2020 *Integrated Development Plan* 282. Also refer to the eThekwini Municipality 2019-2020 *Annual Report* 53.
791 eThekwini Municipality 2020 *Integrated Development Plan* 673-675.
792 eThekwini Municipality 2020 *Integrated Development Plan* 711-712.
793 eThekwini Municipality 2019-2020 *Annual Report* 54-68.
794 eThekwini Municipality 2020 *Integrated Development Plan* 88.
795 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 121-124.

	Section 57 Performance agreement entered into with Municipal Manager linked to the functions of climate change and waste management	Yes		Performance agreement and Performance plan entered into with the Municipal Manager.[796]
	Chapter 11 Are waste management by-laws enforced	Yes		Metropolitan police service enforces by-laws.[797]
	Regulation 14(2)(a) of the Planning and Performance Regulations Performance Audit Committee established and functioning		No	The Audit Committee also performs the functions of the Performance Audit Committee.[798]
MFMA	*Section 53(1)(c)(ii)* SDBIP approved	Yes		SDBIP approved by the executive mayor on 17 June 2021 including matters of climate change and waste management.[799]
	Section 165(1) Internal Audit unit established and functioning	Yes		Internal Audit Unit established and functional.[800]
	Section 166(1) Audit Committee established and functioning	Yes		Refer to page 398 of the EMM Annual Report

5.9 eThekwini Municipality climate change and waste management gap analysis

5.9.1 Climate change mitigation

Although the IDP and policies such as the DCCS and DCAP address the matter of climate change in the form of strategies and plans, it is difficult from a researcher's perspective to evaluate the effectiveness and efficiency of the implementation of the policies, as the Annual Report is silent on the matter of climate change. The impact of the policies on the targets set to limit or reduce GHG emissions to set

796 Refer to para 5.7.1.
797 eThekwini Municipality 2019-2020 *Annual Report* 293.
798 eThekwini Municipality 2020 *Integrated Development Plan* 660.
799 Refer to para 5.6.2 and eThekwini Municipality 2021/2022 SDBIP 1-2.
800 eThekwini Municipality 2019-2020 *Annual Report* 36-37.

targets is therefore also unknown and for the purposes of this study could not be commented on from the perspective of a researcher.

5.9.2 Waste generation and waste collection

a) The data of the EMM waste stream analysis is outdated and require updating to identify the types and quantities of waste generated by sector to plan for waste management activities on the basis of current trends.[801]

b) Not all households receive weekly waste collection services. According to the IWMP there are still 115 542 households not receiving any service and 17 299 households with a service less than every 2 weeks. For logistical reasons, households situated in rural areas receive no service at all.[802]

c) No waste management services ae provided in rural areas and there are no policy guidelines enabling the community to legally and safely dispose of their waste.[803]

d) The fleet vehicles responsible for waste removal need to be better maintained to prevent excessive down-time and to align the fleet specifications with the requirements of the collection of source-separated waste.[804]

5.9.3 Recycling and Re-use

a) The EMM recycling and re-use rates are not in line with the NWMS and NEM:WA and need to be increased;[805]

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801 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 127.
802 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 127-128.
803 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 128.
804 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 128.
805 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 128.

b) The multi-bag separation at source programme is not implemented in all areas of EMM and needs to be extended to be effective - and the coloured bags need to be made more readily available to the community;[806]

c) The number of recycling drop-off centres must be increased to make them more accessible to the community.[807]

5.9.4 Waste treatment and disposal

a) A waste management licence is required for the closure of the Bisasar Road landfill;[808]

b) The Lovu landfill only has a draft waste management licence and the formal waste management licence process needs to be finalised;[809]

c) Waste management licences must be obtained for the Shallcross and Wyebank garden refuse landfills;[810]

d) Household and commercial organic waste (food and garden wastes) are not diverted from landfill sites;[811]

e) No alternative treatment and/or recovery of general waste technology is available to EMM, which needs to undertake feasibility studies.[812]

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806 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 128.
807 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 128.
808 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 129.
809 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 129.
810 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 129.
811 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 129.
812 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 129.

5.9.5 Infrastructure, public awareness and education, human resources and finance

a) The infrastructure needs to be upgraded and maintained to comply with legislative requirements;[813]

b) There are a number of public awareness and education campaigns, but a more coordinated effort relating to specific actions such as recycling, re-use and diverting food and garden waste from landfill sites is required;[814]

c) Vacant key positions in the waste management department must be filled with suitably qualified and experienced employees;[815]

d) The necessary funding must be provided on the EMM budget to implement the IWMP, close redundant and establish new landfills, and license existing and new landfills.[816]

5.9.6 Waste removal by-laws

a) The waste removal by-laws are primarily focussed on the collection, removal and disposal of waste at landfill sites and not on waste minimisation, recycling and re-use. Although the diversion of garden refuse is addressed, the diversion of food waste is not addressed in the by-laws.[817]

b) Although the waste removal by-laws contain a section on the recycling, re-use, sorting and reduction of waste,[818] the said section aims to regulate the recycling, re-use and waste minimisation by service providers and not by individual households.

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813 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 130.
814 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 130.
815 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 130.
816 eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* 131.
817 Section 3 of the eThekwini Municipality 2016 *Waste Removal By-laws*.
818 Section 40 of the eThekwini Municipality 2016 *Waste Removal By-laws*.

c) The definitions of "waste", "recyclable waste" and "recycling"[819] are wide and will not give the general public sufficient guidance as to what waste material is intended to be recycled, which could result in not attaining the goal of diverting recyclable waste material from landfill sites;

d) Provision is made for waste containers and plastic bags to be supplied to consumers by EMM[820] but no provision is made for the multi-coloured bag system for the purposes of separation at source to facilitate the recycling and re-use of waste material;

e) There are no incentives for the community to reduce, recycle or re-use waste in the by-laws;

f) Although the by-laws provide for their enforcement, it is evident from the Annual Report that the enforcement of the waste removal by-laws is not sufficiently effective and could be approved upon.[821]

5.9.7 Internal Audit Unit and Audit Committee

The Audit Committee in its audit report confirms the functioning of the Internal Audit Unit[822] and statutory compliance,[823] but fails to express a specific viewpoint on compliance with environmental legislation or the effective and efficient execution of the functions of climate change mitigation and waste management.

5.9.8 Service Delivery and Budget Implementation Plan

a) The SDBIP sets as a KPI for climate change matters the production of an annual report on the implementation of the DCAP and the DCCS,[824] but this measurement is quantitative and not qualitative in the actual measurement of

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819 Section 1 of the eThekwini Municipality 2016 *Waste Removal By-laws*.
820 Sections 6 and 7 of the eThekwini Municipality 2016 *Waste Removal By-laws*.
821 eThekwini Municipality 2019-2020 *Annual Report* 293.
822 eThekwini Municipality 2019-2020 *Annual Report* 545-546.
823 eThekwini Municipality 2019-2020 *Annual Report* 544-545.
824 eThekwini Municipality 2021/22 SDBIP 8.

the effective and efficient implementation of the plans and the inclusion of remedial actions in the event that the KPIs are not met. The target for the completion of the reports is set for the 4th quarter, which does not make provision for constant monitoring and if sufficient progress with implementation is not made, there will not be sufficient time to implement remedial actions. Goals set should be specific, measurable, achievable, realistic and timely.[825] The SDBIP does not include the EMM's commitment to divert 50% of waste from landfill sites, which is a critical target set in the IWMP.[826]

b) For the function of waste management, the SDBIP sets as a KPI the reduction of backlogs relating to access to waste removal services for households, from a base line of 82% households having access to 95% access.[827] The target set for quarters 1 to 4 is 95%, which is unrealistic, considering the magnitude of the backlog indicated earlier in this study.[828] A more realistic approach would have been a staggered approach increasing the percentage of the reduction in every quarter, with the ultimate goal of 95% reached at the completion of the financial year.

A target of 8% of solid waste recycled out of the total solid waste disposed of is set. However, this target is not aligned with the goal of 10% for the 2021 financial year set in the IWMP.[829]

5.9.9 Performance agreements of the Municipal Manager and senior management

The KPIs of the performance agreements of the municipal manager and the deputy municipal manager responsible for the functions of climate change and waste

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825 Bjerke and Renger 2017 *Evaluation and Program Planning* 125.
826 Refer to para 5.3.4.
827 eThekwini Municipality 2021/22 SDBIP 26.
828 Refer to para 7.2 that indicates 115 542 households not receiving a service and only 25% of waste collected from informal settlements.
829 Refer to para 5.6.3.

management are linked to the SDBIP and the gaps identified under the SDBIP will also be applicable to the performance agreements.[830]

5.10 Recommendations

a) All plans, strategies and programmes of the municipality should be included in the IDP and the goals and outcomes of the plans, strategies and programmes should therefore be aligned.

b) The goals and outcomes of all plans, strategies and programmes in the IDP should be contained and aligned in the SDBIP, linked to KPIs and the relevant resources and budget.

c) The KPIs in the IDP's should be specific to determine the expected outcome, measurable to be able to evaluate the achievement in each quarter of the financial year, achievable within the means of the municipality, realistic and not too ambitious, and linked to a timeframe to allow the effective and efficient completion of the KPI.

d) The waste removal by-laws should be reviewed to include all matters relating to waste management, including waste minimisation, recycling, re-use, and the diversion of certain types of waste such as food and garden waste from landfill sites. The by-laws should include some form of incentive for households that reduce or minimise waste, such as a rebate on rates and/or taxes.

e) The necessary resources and budget must be provided to implement the IDP and address the KPIs relating to the functions of climate change and waste management.

f) All the policies, plans, strategies and plans with an assessment of the progress with the implementation thereof should be placed on the EMM official website

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[830] Refer to para 7.7.

to inform the community of the implementation of service delivery and to afford the community the opportunity to participate in decision making.

g) All climate-change related activities and plans should be contained in one single document to facilitate ease of access to information by stakeholders, including the community.

h) Priority should be given to waste minimisation, recycling and re-use projects as well as the education of the community relating to the benefits thereof.

5.11 Conclusion

A practical case study of EMM has been conducted in this chapter to determine its application of the legal landscape relating to climate change mitigation and waste management and the extent to which EMM complies with the said legal landscape. The legal compliance of EMM was measured against national, provincial and local government legislation to determine whether EMM has the necessary strategies, policies, by-laws and structures in place to implement mitigation measure to address the negative impact of climate change and to deliver such effective and efficient waste management services as to limit or reduce the GHG emissions into the atmosphere. The status of waste and waste minimisation in EMM was reviewed, and it was established that although efforts are made to minimise waste and divert waste from landfill sites, not enough is done to have a significant impact on waste accumulation. A strategic, high-level legal compliance matrix was developed and used to measure the extent to which EMM complies with the environmental legal landscape. Possible gaps in compliance were identified between the legal requirements and the practical implementation thereof by EMM. Some recommendations were also made to address the gaps identified on the road to legal compliance. The legal compliance matrix was developed as a starting point for the legal compliance check and not a final product, as compliance and progress need to be updated on a continuous basis. The matrix should be developed further as a living document to include accountable persons in order to ensure legal compliance and the implementation of the provisions of environmental legislation,

KPIs, timeframes and remedial actions, with the object of attaining full legal compliance. The legal compliance matrix should be made part of the IDP and the SDBIP to ensure that the necessary attention is given to it by the municipal council, the Municipal Manager and the senior management. It should form part of the PMS and matters for consideration should be dealt with by the various EMM structures. Provision should also be made for quarterly feedback on the status of compliance and progress, which could then also filter into the PMS. If it formed part of the IDP, this would also ensure that the EMM community had relevant information relating to the municipality's environmental legal compliance.

Chapter 6: Conclusion and recommendations

6.1 Overview

The aim of the study was to answer the question of what should be included in a comprehensive legal and policy framework for local government to regulate, monitor and evaluate compliance with legislation in implementing climate change mitigating measuresfor the function of waste management. In answering the question, the focus was placed on two main components, namely the regulatory legal compliance framework and the tools to monitor and evaluate compliance with the framework concerned.

The study commenced with an explanation of climate change as a phenomenon and noted that human behaviour is causing the warming of the atmosphere, ocean, cryosphere and biosphere. Climate change impacts negatively on the environment and human life, giving rise to extreme weather and climate events such as cold and warm temperature extremes, extremely high sea levels, and increased rainfall in some areas and droughts in other areas. South Africa is also impacted by the effects of climate change. Climate change is attributed *inter alia* to the emission of GHGs such as carbon dioxide and methane concentrations, some of which results from waste management processes and landfills.[831] The international community has taken notice of the impact of climate change and identified measures to mitigate its impact by implementing strategies to reduce GHG sources and emissions and to enhance GHG sinks.[832] It was indicated that the waste sector could participate in climate change mitigation through improving waste material management, resulting in waste prevention, followed by the recycling and re-use of waste materials.[833]

The study next focussed on the response of the international community to climate change by introducing an international legal framework to mitigate the impacts of

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831 See para 1.2.
832 See para 1.3.
833 See para 1.4.

climate change. In terms of international instruments such as the UNFCCC, the *Kyoto Protocol*, and the *Paris Agreement*, mitigation mandates were established to reduce GHG emissions.[834] States are required to set targets and make commitments, known as NDCs, to contribute to GHG reduction, to keep "the increase in the global average temperature to well below 2°C above pre-industrial levels and to limit the temperature increase to 1,5°C above pre-industrial levels."[835] The principle of CBDR-RC places a heavier climate change burden on developed countries as they historically contributed more to the current GHG concentrations in the atmosphere and they need to cooperate with developing countries to achieve global sustainable development.[836] Solid waste disposal is identified as one of the factors contributing to climate change, and countries are encouraged to establish reforms to limit or reduce their GHG emissions.[837] Local government is recognised as a "government stakeholder" of the UNFCCC and therefore needs to adhere to the provisions of the international instruments.[838]

South Africa's environmental legislation was analysed next to establish its alignment with international instruments and to what extent it constitutes a guiding legislative framework for South African local government to respond to climate change, with specific reference to the waste management sector. The Constitution sets the tone for the South African environmental landscape and provides that the state must "protect the environment for the benefit of current and future generations, through taking reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure the ecologically sustainable development and use of natural resources while promoting justifiable economic and social development".[839] It was established that the *National Climate Change Response Green* and *White Papers* and the *Climate Change Bill* aim to effectively manage the impacts of climate change and make a reasonable

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834 See para 2.3.
835 See para 2.3.3.
836 See para 2.3.1.
837 See para 2.3.2.
838 See para 2.4.
839 See para 3.2.

contribution to the international measures to stabilise GHG concentrations in the atmosphere to avoid human interference with the climate system.[840] It was indicated that the NEMA is South Africa's principle environmental framework legislation that provides for general principles and obligations to guide all activities that have an impact on the environment.[841] The NEM:WA was discussed as framework legislation developed under the NEMA, specifically regulating waste management activities. The NEM:WA obligates all organs of state, including municipalities, to determine uniform measures to reduce the amount of waste generated, and where waste is generated to facilitate the re-use, recycling and recovering of waste in an environmentally acceptable manner. As a last resort waste should be safely disposed of at landfill sites (referred to as the principles of the waste hierarchy).[842] The NEM:WA mandates municipalities to adopt IWMPs and by-laws to implement the waste hierarchy. An overview was given of regulations, norms and standards relating to the waste management sector.[843] The NWMS was considered and shown to set priorities, guidelines, targets and procedures for the protection of the environment and the reduction of waste generation.[844]

The South African local government legal landscape was then analysed to determine the obligations and responsibilities of municipalities relating to climate change mitigation and waste management, as part of its legislative mandate in performing its powers and duties. It was established that the most pertinent pieces of legislation regulating the local government environment are the Constitution, the *Municipal Structures Act*, the *Municipal Systems Act* and the MFMA. All these pieces of legislation contain LEG tools to regulate, monitor and evaluate compliance with legislation in implementing climate change mitigation matters and can be used in relation to the function of waste management. The LEG tools discussed include the IDP as the single, inclusive and strategic plan for development of the municipality,

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840 See paras 3.3.3; 3.3.4 and 3.3.5.
841 See para 3.3.6.
842 See para 3.3.7.
843 See paras 3.3.7.1 to 3.3.7.6.
844 See para 3.3.8.

the PMS to ensure that the plans of the municipality are being implemented, that envisaged development outcomes and impacts are achieved, and that resources are utilised effectively and efficiently. Linked to the IDP and the PMS is the SDBIP, representing an action plan for the implementation for the IDP, the PMS and the municipal budget. Various municipal structures to be utilised as LEG tools, such as the section 79 portfolio committees, MPAC, audit committee, performance audit committee and internal audit unit, were analysed to establish their contribution to the monitoring and evaluation of the implementation of climate change mitigation and waste management measures. It was established that municipalities have the legislative authority to adopt, implement and enforce by-laws, which can be LEG tools to ensure compliance with environmental legislation by internal and external stakeholders, including the community.

A basic legal compliance matrix was drafted from the analysis of the environmental legislative landscape to set out the regulatory legal framework relating to waste management climate change mitigating factors and to measure the compliance of municipalities with the environmental legal framework. A case study of EMM was conducted to establish the status of the municipality in relation to climate change and waste management matters, and the LEG tools employed at the municipality to evaluate compliance and performance in the execution of the legal mandates of the climate change and waste management functions. EMM has an obligation to place all its policies, strategies and plans on its official website, and therefore the methodology used for the case study was a desk-top study utilising the official website as the primary source of information and populating the draft legal compliance matrix. A gap analysis was also conducted to identify certain gaps in the compliance of EMM with its legal mandate relating to the functions of climate change and waste management. Recommendations were made to address the gaps identified to ensure future legal compliance.

6.2 Key findings

The following key findings are made:

- The international community acknowledges the reality of climate change and its negative impact on the environment and human life and commits to address the impacts of climate change through legally binding instruments such as the *Paris Agreement*.
- South Africa is still in the process of establishing specific climate change legislation through the *Climate Change Response Green* and *White Papers* and the *Climate Change Bill*;
- South Africa addresses environmental matters in the Constitution and national legislation such as the NEMA and the NEM:WA;
- The NEMA sets out environmental management principles guiding authorities in decision making relating to environmental matters that could also be utilised to address climate change;
- The NEM:WA sets out environmental management principles specifically relating to waste management, guiding authorities in decision making relating to waste minimisation, recycling, re-use and diversion from landfill sites with the aim of reducing or limiting the impact of climate change;
- Local government is mandated by the Constitution and national legislation to perform the functions of environmental management and waste management and these functions can also be used to respond to its responsibility to address climate change;
- The legal framework, including the Constitution, the *Municipal Structures and Systems Acts* and the MFMA, provides local government with mandates, guidance and LEG tools to regulate, monitor and evaluate compliance with legislation in implementing climate change mitigating factors and waste management services;

- The IDP as a single, inclusive and strategic plan for development of a municipality could be used as an effective LEG tool to guide the response of a municipality to climate change and effective and efficient waste management;
- The SDBIP, as an implementation plan for the IDP, is an essential tool to set KPIs in achieving climate change targets and to ensure efficient and effective delivery of waste management services by committing relevant action plans, resources and funding to projects;
- Executive and legislative powers are allocated to local government, and a municipality could promulgate by-laws in response to climate change and the rendering of waste management services;
- Local government has various LEG tools to perform oversight over the effective and efficient rendering of waste management services and the impact on climate change, such as the council committees (section 79 portfolio committees, audit and performance audit committees and MPAC), organisational and individual PMS, internal audit and public participation.

The following possible gaps were identified:

- There is a need for specific climate change legislation, aligned with South Africa's international commitments, setting clear mandates, objectives and targets for local government to implement in its response to climate change matters;
- Local government is not exercising its executive and legislative authority to use its by-laws in setting clear requirements, objectives and targets to address the impact of climate change and ensure the delivery of effective and efficient waste management services to minimise waste and to encourage the recycling and re-use of waste;
- By-law enforcement is not focussing on climate change and waste management matters;
- Municipalities do not have sufficient capacity in terms of infrastructure, human and financial resources to respond to climate change and deliver waste management services in accordance with the required norms and standards;

- Not all climate change and waste management strategies, programmes and plans are included in and/or aligned with the IDP and SDBIP, resulting in a lack of allocation of resources, poor service delivery, and the ineffective monitoring and evaluation of the services;
- Municipalities are not using all the available LEG tools to monitor and evaluate the response to climate change and the rendering of waste management services.
- Public participation processes are not effectively implemented to inform and capacitate the community to make meaningful contributions towards climate change and waste management matters.

6.3 Recommendations

Taking cognisance of the above findings, the following recommendations are proposed:

- The *Climate Change Bill* needs to be finalised and enacted to clearly set out the mandates, roles and responsibilities of the three spheres of government;
- Comprehensive standard by-laws need to be developed to facilitate the execution of municipalities' executive and legislative authority to effectively and efficiently regulate, monitor and enforce their response to climate change and waste management, to avoid or minimise waste;
- National, provincial and local government should prioritise the functions of climate change and waste management and allocate sufficient resources and funding to effectively and efficiently render the services;
- Municipalities should ensure that the IDP, SDBIP, strategies, plans and programmes include climate change considerations and that all these plans are aligned with national and provincial legislation and with the plans of the municipalities;
- Climate change action plans, SDFs and IWMPs must be part of the IDP as specific chapters to ensure adequate resource allocation to address climate change and waste management matters;

- Municipalities should designate an administrative and political champion for climate change matters who will ensure that climate change mitigation and adaptation are considered in all municipal operations;
- Municipalities should implement and expand on the draft legal compliance matrix not only to ensure full compliance with legislation, but that it be utilised as a monitoring tool to evaluate the impact on its climate change response and waste management implementation, and to add value to the functions;
- Progress reports regarding the implementation of the functions of waste management and the response to climate change should be standard items on the agendas of the Council, the relevant section 79 portfolio committee, the audit and performance audit committees, and the MPAC.
- A public participation policy should be implemted to capacitate the community to meaningfully participate in the functioning of the municipality.

6.4 Conclusion

The study has highlighted that climate change is a reality threatening the global environment and the future of human life on earth as we know it. The existence of the phenomenon of climate change necessitates a combined response from all levels of government to limit or reduce the impact thereof. The study has indicated that local government has a responsibility to respond to climate change and a specific mandate to perform the function of waste management in such a manner as to positively impact climate change by reducing and minimising waste that contributes to higher GHG concentrations in the atmosphere. An environmental legal framework is available to local government to guide it towards achieving the aforesaid objectives and targets and to effectively and efficiently regulate, monitor and evaluate climate change mitigation factors for the function of waste management. The time to act and comply with the legal framework is now.

BIBLIOGRAPHY

Literature

Ackerman 2000 *IJJS*

Ackerman F "Waste management and climate change" 2000 *Local Environment: The International Journal of Justice and Sustainability* 223-229

Alberts "Solid Waste Management"

Alberts R "Solid Waste Management" in Du Plessis AA (ed) *Environmental Law and Local Government in South Africa* (Juta Cape Town 2015) Chapter 13 408-444

Alberts "Waste management in South Africa"

Alberts R "Waste management in South Africa – Challenges and Opportunities for Climate Change Mitigation" in Humby T *et al* (eds) C*limate Change: Law and Governance in South Africa* (Juta Cape Town 2016) Chapter 19 1-18

Asha and Madzivhandila 2016 *Journal of Public Administration*

Asha AA and Madzivhandila TS "Local response to the impacts of climate change in South Africa" 1 March 2016 *Journal of Public Administration* 154-164

Baker *et al* 2012 *Landscape and Urban Planning*

Baker I *et al* "Local Government response to the impacts of Climate Change: An evaluation of local climate adaptation plans" 2012 *Landscape and Urban Planning* 127-136

Baloyi (ed) *Waste Act Made Easy*

Baloyi O (ed) (Department of Environmental Affairs) *Waste Act Made Easy - A user friendly guide to the National Environmental Management Waste Act, 2008* (Act No 59 of 2008) (DEA Pretoria 2011)

Barnard 2012 *PELJ*

Barnard M "The role of international sustainable development law principles in enabling effective renewable energy policy - A South African perspective" 2012 *Potchefstroom Electronic Law Journal* 207-243

Bjerke and Renger 2017 *Evaluation and Program Planning*

Bjerke MB and Renger R "Being smart about writing SMART objectives" 2017 *Evaluation and Program Planning* 125-127

Blobel *et al* (eds) *UNFCCC Handbook*

Blobel D, Meyer-Ohlendorf N, Schlosser-Allera C and Steel P (eds) *United Nations Framework Convention on Climate Change: Handbook* (UNFCCC Bonn Germany 2006)

Bodansky 2017 *AJIL*

Bodansky D "The Paris Climate Change Agreement: A New Hope?" 2017 *American Journal of International Law* 288-319

Bodansky, Brunnée and Rajamani *International Climate Change Law*

Bodansky D, Brunnée J and Rajamani L *International Climate Change Law* (Oxford University Press Oxford 2017)

Bortsheller 2010 *Sustainable Development Law and Policy*

Bortscheller MJ "Equitable but ineffective: How the principle of common but differentiated responsibilities hobbles the global fight against climate change" 2010 *Sustainable Development Law and Policy* 49-69

Brunnée and Streck 2013 *Climate Policy*

Brunnée J and Streck C "The UNFCCC as a negotiation forum: towards common but more differentiated responsibilities" 2013 *Climate Policy* 589-607

Bulkeley and Betsill *Cities and Climate Change*

Bulkeley H and Betsill M *Cities and Climate Change, Urban Sustainability and Global Environmental Governance* (Routledge London 2003)

Carter and Barnard "Demystifying the Global Climate Change Regime"

Carter S and Barnard M "Demystifying the Global Climate Change Regime" in Humby T *et al* (eds) *Climate Change Law and Governance in South Africa* (Juta Cape Town 2016) 3-16

Christmas and De Visser 2009 *Commonwealth Journal of Local Governance*

Christmas A and De Visser J "Bridging the gap between theory and practice: Reviewing the functions and powers of local government in South Africa" 2009 *Commonwealth Journal of Local Governance* 107-119

Crowley *Science*

Crowley TJ "Causes of Climate Change over the past 1000 years" *Science* (14 July 2000) 270-277

Demirbas 2011 *Energy Conversion and Management*

Demirbas A "Waste management, waste resource facilities and waste conversion processes" 2011 *Energy Conversion and Management* 1280-1287

De Visser 2005 *Developmental Local Government: A case study of South Africa*

De Visser J *Developmental local Government: A case study of South Africa* (Antwerpen Oxford 2005)

De Visser 2007 *Local Government Bulletin*

De Visser J "Service delivery and budget implementation plan: Common sense rather than mere compliance" 2007 *Local Government Bulletin* 10-11

Dumanski 2004 *Climate Change*

Dumanski J "Carbon sequestration, soil conservation, and the Kyoto Protocol: Summary of implications" 2004 *Climate Change* 255-261

Du Plessis *Fulfilment of South Africa's constitutional environmental right*

Du Plessis AA *Fulfilment of South Africa's constitutional environmental right in the local government sphere* (LLD-thesis North-West University Potchefstroom 2008)

Du Plessis 2010 *Stell LR*

Du Plessis A "'Local environmental governance' and the role of local government in realising section 24 of the South African Constitution" 2010 *Stellenbosch Law Review* 265-297

Du Plessis 2015 *PELJ*

Du Plessis AA "The 'brown' environmental agenda and the constitutional duties of local government in South Africa: A conceptual introduction" 2015 *Potchefstroom Electronic Law Journal* 1846-1880

Du Plessis *Environmental Law and Local Government*

Du Plessis AA (ed) *Environmental Law and Local Government in South Africa* (Juta Cape Town 2015)

Du Plessis and Kotzé 2014 *JAL*

Du Plessis A and Kotzé L "The heat is on: Local government and climate governance in South Africa" 2014 *Journal of African Law* 145-174

Du Plessis and Nel "An Introduction"

Du Plessis AA and Nel JG "An Introduction" in Du Plessis AA (ed) *Environmental Law and Local Government in South Africa* (Juta Cape Town 2015) Chapter 1 3-39

Fawzy *et al* 2020 *Environmental Chemistry Letters*

Fawzy S, Osman AI, Doran J and Rooney DW "Strategies for mitigation of climate change: a review" 2020 *Environmental Chemistry Letters* 2069-2094

Feris 2008 *SAJHR*

Feris L "Constitutional environmental rights: An under-utilised resource" 2008 *South African Journal on Human Rights* 29-49

Feris "Environmental rights protected in the Constitution"

Feris L "Environmental rights protected in the Constitution of the Republic of South Africa" in Du Plessis A (ed) *Environmental Law and Local Government* (Juta Cape Town 2015) Chapter 6 219-240

Ferrari, Gamberini and Rimini 2016 *Int J Sus Dev Plann*

Ferrari K, Gamberini R and Rimini B "The waste hierarchy: A strategic, tactical and operational approach for developing countries. The case study of Mozambique" 2016 *International Journal of Sustainable Development and Planning* 759-770

Fuggle and Rabie *Environmental Management in South Africa*

Fuggle RF and Rabie MA *Environmental Management in South Africa* (Juta Cape Town 2014)

Fuo 2013 *PELJ*

Fuo O *"Constitutional basis for the enforcement of executive policies that give effect to socio-economic rights in Sout Africa"* 2013 PELJ 1-44

Glazewski and Du Toit *Environmental Law*

Glazewski J and Du Toit L *Environmental Law in South Africa* (LexisNexis Durban 2019)

Houghton *Global Warming*

Houghton J *Global Warming: The Complete Briefing* 4th ed (Cambridge University Press Cambridge 2009)

IPCC 1995 *2nd Assessment Report*

Intergovernmental Panel on Climate Change (IPCC) 1995 *Second Assessment Report: Climate Change* available at https://www.ipcc.ch/site/assets/uploads/2018/05/2nd-assessment-en-1.pdf accessed 27 August 2020

IPCC 2007 *4th Assessment Report*

Intergovernmental Panel on Climate Change (IPCC) 2007 *Fourth Assessment Report 2007: Impacts, Adaptation and Vulnerabilities available at* https://www.ipcc.ch/site/assets/uploads/2018/03/ar4_wg2_full_report.pdf accessed 27 August 2020

IPCC 2014 *5th Assessment Report*

Intergovernmental Panel on Climate Change (IPCC) 2014 *IPCC Fifth Assessment Report of the Intergovernmental Panel on Climate Change* available at https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf accessed 27 August 2020

IPCC 2021 *6th Assessment Report*

Intergovermental Panel on Climate Change (IPCC) 2021 *Sixth Assessment Report: The Physical Science Basis (Summary for Policymakers)* available at https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf accessed 9 August 2021

ISWA 2012 *Globalization and Waste Management*

International Solid Waste Association (ISWA) 2012 *Globalization and Waste Management* available at https://www.researchgate.net/profile/Antonis-Mavropoulos/publication/275016989_Globalisation_and_waste_management_Phase_1_-_concepts_and_facts/links/552e385e0cf2d4950717bb11/Globalisation-and-waste-management-Phase-1-concepts-and-facts.pdf accessed 16 March 2020

Jigar, Bairu and Gesessew 2014 *Journal of Environmental Science and Water Resources*

Jigar E, Bairu A and Gesessew A "Application of IPCC model for the estimation of methane from municipal solid waste landfill" 2014 *Journal of Environmental Science and Water Resource* 52-58

Karl and Trenberth 2003 *Science*

Karl TR and Trenberth KE "Modern global climate change" 2003 *Science* 1719-1723

Kidd *Environmental Law*

Kidd MA *Environmental Law* 2nd ed (Juta Cape Town 2011)

Klaus *Measuring Customer Experience*

Klaus P *Measuring Customer Experience* (Palgrave Macmillan London 2015)

Kotzé *et al* "Climate Change Law and Governance"

Kotzé L *et al* "Climate Change Law and Governance in South Africa: Setting the Scene" in Humby T *et al* (eds) *Climate Change Law and Governance in South Africa* (Juta Cape Town 2016) Chapter 1 1-32

Mokale and Scheepers *An introduction to the developmental local government system*

Mokale T and Scheepers T *An introduction to the developmental local government system in South Africa* (Montfort Press Blantyre, Malawi 2006)

Nel, Du Plessis and Du Plessis "Instrumentation for local environmental governance"

Nel JG, Du Plessis W and Du Plessis A "Instrumentation for local environmental governance" in Du Plessis A (ed) *Environmental Law and Local Government in South Africa* (Juta Cape Town 2015) Chapter 3 91-166

Nel and Du Plessis 2004 *SAPL*

Nel J and Du Plessis W "Unpacking Integrated environmental management: a step closer to effective co-operative governance?" 2004 *South African Public Law* 181-190

Orakhelashvili *Akehurst's Modern Introduction to International Law*

Orakhelashvili A *Akehurst's Modern Introduction to International law* (Routledge New York 2019)

Powell, Chertow and Esty 2018 *Waste Management*

Powell JT, Chertow M and Esty D "Where is global waste management heading? An analysis of solid waste sector commitments from nationally-determined contributions" 2018 *Waste Management* 137-143

Ramanathan and Feng 2009 *Atmospheric Environment*

Ramanathan V and Feng Y "Air pollution, greenhouse gases and climate change: Global and regional perspectives" 2009 *Atmospheric Environment* 37-50

Roberts 2008 *Environment and Urbanisation*

Roberts D "Thinking globally, acting locally - institutionalizing climate change at the local government level in Durban, South Africa" 2008 *Environment and Urbanisation* 521-537

Roberts and O'Donoghue 2013 *Environment and Urbanisation*

Roberts D and O'Donoghue S "Urban environmental challenges and climate change action in Durban, South Africa" 2013 *Environment and Urbanization* 299-319

Rumsey and King "Climate Change: Impacts, Adaptationand Mitigation; Threats and Opportunities"

Rumsey AB and King ND "Climate Change: Impacts, Adaptation and Mitigation; Threats and Opportunities" in Strydom HA and King ND (eds) *Fuggle and Rabie's Environmental Management in South Africa* (Juta Cape Town 2009) 1048-1078

Shishlov and Bellassen 2016 *Climate Policy*

Shishlov I and Bellassen V "Review of the experience with monitoring uncertainty requirements in the Clean Development Mechanism" 2016 *Climate Policy* 703-731

Steytler and De Visser *Local Government Law*

Steytler N and De Visser J *Local Government Law of South Africa* (LexisNexis Durban 2007)

Taylor *et al* "Urban Adaptation"

Taylor A *et al* "Urban Adaptation" in Humby T *et al* (eds) *Climate Change Law and Governance in South Africa* (Juta Cape Town 2016) Chapter 11 1-38

Tjell *Waste Management and Research* 195

Tjell JC "CDM and JI in SWM" 2006 *Waste Management and Research* 195-196

Contributing editors: Daniel Blobel and Nils Meyer-Ohlendorf of Ecologic – Institute for International and European Environmental Policy, Berlin, and Carmen and Penny Steel.

Van der Bank and Karsten 2020 *Air, Soil and Water Research*

Van der Bank M and Karsten J "Climate Change and South Africa: A critical analysis of the Earthlife Africa Johannesburg and Another v Minister of Energy and Others 5662/116 case and the drive for concrete climate practices" 2020 *Air, Soil and Water Research* 1-11

Van Ewijk and Stegemann 2016 *Journal of Cleaner Production*

Van Ewijk S and Stegemann JA "Limitations of the waste hierarchy for achieving absolute reductions in material throughput" 2016 *Journal of Cleaner Production* 122-128

Wang and Stanisavljevic 2019 *Waste Management and Research*

Wang X and Stanisavljevic N "Can waste management be hailed as a climate change mitigation leader" 2019 *Waste Management and Research* 1181-1182

Ziervogel *et al* 2014 *WIREs Climate Change*

Ziervogel G, New M, Van Garderen EA, Taylor MA, Hamann R, Stuart-Hill S, Myers J and Warburton M Climate Change impacts and adaptation in South Africa 2014 *WIREs Climate Change* 605-620

Case law

Borbet South Africa (Pty) Ltd & Others v Nelson Mandela Bay Municipality 2014 (5) SA 256 (ECP)

CDA Boerderye (Edms) Bpk v Nelson Mandela Metropolitan Municipality 2007 4 SA 276 (SCA)

Doctors for Life International v Speaker of the National Assembly 2006 6 SA 416 (CC)

EarthLife Africa Johannesburg v Minister of Environmental Affairs 2017 2 All SA 519 (GP)

Fedsure Life Assurance Ltd v Greater Johannesburg Transitional Metropolitan Council 1999 1 SA 374 (CC)

Fuel Retailers Association of Southern Africa v Director General Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province 2007 6 SA 4 (CC)

Government of the Republic of South Africa v Grootboom 2001 1 SA 46 (CC)

Le Sueur v Ethekwini Municipality (9714/11) [2013] ZAKZPHC 6 (30 January 2013)

Maccsand (Pty) Ltd v City of Cape Town 2012 4 SA 181 (CC)

Ngaka Modiri Molema District Municipality v Chairperson, North West Provincial Executive Committee 2014 ZACC 31

Legislation

City of Cape Town Integrated Waste Management By-laws, 2009 WCPG 6651 of 21 August 2009

Constitution of the Republic of South Africa, 1996

eThekwini Municipality Waste Removal By-laws, 2016 MN 117 KNPG dated 25 August 2016

Intergovernmental Relations Framework Act 13 of 2005

Local Government: Municipal Finance Management Act 56 of 2003

Local Government: Municipal Structures Act 117 of 1998

Local Government: Municipal Systems Act 32 of 2000

National Environmental Management Act 107 of 1998

National Environmental Management: Waste Act 59 of 2008

International instruments

Cancun agreements outcome of the work of the Ad Hoc Working Group on the long term Cooperative Action under the Convention (2010)

COP21 Adoption of the Paris Agreement (2015)

Durban Local Government Convention: adapting to a changing climate (2011)

Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997)

Paris Agreement (2015)

Rio Declaration on the Environment and Development (1992)

United Nations Framework Convention on Climate Change (1992)

Vienna Convention on the Law of Treaties (1969)

Government publications

Gauteng Provincial Gazette 216 of 30 July 2013 (*Waste Management By-laws*, 2009)

GHG Inventory for South Africa, 2000-2010

GN 580 in GG 41689 of 8 June 2018 (*Climate Change Bill*, 2018)

GN 921 in GG 37083 of 29 November 2013 (*List of Waste Management Activities that have, or likely to have, a detrimental effect on the environment*, 2013)

GN 926 in GG 37088 of 29 November 2013 (*National Norms and Standards for the Storage of Waste*, 2013)

GNR 270 in GG 33935 of 21 January 2011 (*Municipal Waste Sector Plan*, 2012)

GNR 344 in GG 35206 of 30 March 2012 (*National Waste Management Strategy*, 2012)

GNR 625 in GG 35306 of 4 May 2012 (*National Waste Information Regulations*, 2012)

GNR 634 in GG 36784 of 23 August 2013 (*Waste Classification and Management Regulations*, 2013)

GNR 635 in GG 36784 of 23 August 2013 (*National Norms and Standards for the Assessment of Waste for Landfill Disposal*, 2013)

GNR 636 in GG 36784 of 23 August 2013 (*National Norms and Standards for Waste Disposal and Landfill*, 2013)

GNR 777 in GG 32439 of 24 July 2009 (*National Domestic Waste Collection Standards*, 2011)

GNR 796 in GG 22605 of 24 August 2001 (*Local Government: Municipal Planning and Performance Management Regulations*, 2001)

KwaZulu Natal Provincial Gazette 1722 of 25 August 2016 (*Waste Removal By-laws*, 2009)

National Climate Change Reponse White Paper, 2011

National Waste Composting Strategy, 2013

National Waste Management Strategy, 2020

South Africa's Intended Nationally Determined Contribution, 2015

South Africa's First Nationally Determined Contribution 2020/2021 Update, 2021

South Africa's Third National Communication under the United Nations Framework Convention on Climate Change, 2018

Western Cape Provincial Gazette 6651 of 21 August 2009 (*Integrated Waste Management By-law*, 2009)

White Paper on Local Government, 1998

Internet sources

Anon *Climate Focus*

Anon "Paris Agreement Summary" *Climate Focus* (28 December 2015) 1-6 https://www.climatefocus.com/sites/defult/files/20151228COP21briefingFIN.pdf accessed 17 March 2021

ASSAf 2011 *Towards a Low Carbon City: Focus on Durban*

Academy of Science of South Africa (ASSAf) 2011 *Towards a Low Carbon City: Focus on Durban* available at https://research.assaf.org.za/handle/20.500.11911/41 accessed 22 February 2021

Carbon Brief Clear on Climate 2018 *The Carbon Brief Profile: South Africa*

Carbon Brief Clear on Climate 2018 *The Carbon Brief Profile: South Africa* available at https://www.carbonbrief.org/the-carbon-brief-profile-south-africa accessed 22 February 2021

Centre for Environmental Rights 1994 https://cer.org.za/virtual-library/legislation/international-instruments/united-nations-framework-convention-on-climate-change-1992

Centre for Environmental Rights 1994 *United Nations Framework Convention on Climate Change* https://cer.org.za/virtual-library/legislation/international-instruments/united-nations-framework-convention-on-climate-change-1992 accessed 16 February 2021

City of Cape Town 2017 http://savingelectricity.org.za/wp-content/uploads/2018/01/climate_change_policy.pdf

City of Cape Town 2017 *Climate Change Policy (No 46824)* http://saving electricity.org.za/wp-content/uploads/2018/01/climate_change_policy.pdf accessed 12 March 2020

DEA 2014 https://www.environment.gov.za/sites/default/files/docs/greenhouse gas_invetorysouthafrica.pdf

DEA 2014 *GHG Inventory for South Africa 2000-2010* available at https:// www.environment.gov.za/sites/default/files/docs/greenhousegas_invetoryso uthafrica.pdf accessed 3 August 2021

DFFE 2021 https://www.environment.gov.za/sites/default/files/docs/greenhouse gas_inventorysouthafrica2017.pdf

DFFE2021 http://www.environment.gov.za/sites/default/files/docs/greenhousegas_inven torysouthafrica2017 accessed on 30 March 2022

DFFE 2016 http://www.environment.gov.za/mediarelease/southafricasignsparis agreementon climate

Department: Forestry,Fisheries and the Environment (DFFE) 2016 *South Africa signs Paris Agreement on Climate Change in New York* http://www.en vironment.gov.za/mediarelease/southafricasignsparisagreementonclimate accessed 16 March 2020

DEFF 2019 https://www.environment.gov.za/projectsprogrammes/workingon waste

Department of Environment Forestry and Fisheries (DEFF) 2019 *Working on Waste* https://www.environment.gov.za/projectsprogrammes/workingon waste accessed 16 March 2021

DFFE 2021 https://www.environment.gov.za/mediarelease/creecy_indc2021draft launch_climatechangecop26

Department Forestry Fisheries and the Environment (DFFE) 2021 *South Africa's updated draft Nationally Determined Contribution (NDC) launched* https://www.environment.gov.za/mediarelease/creecy_indc2021draftlaunch_climatechangecop26 accessed 3 August 2021

eThekwini Municipality 2007 *Climate Change: What does it mean for eThekwini Municipality*

eThekwini Municipality 2007 *Climate Change: What does it mean for eThekwini Municipality* available at http://www.durban.gov.za/City_Services/development_planning_management/environmental_planning_climate_protection/Publications/Documents/Climate%20Change%20what%20does%20it%20mean%20for%20EM.pdf accessed 7 April 2021

eThekwini Municipality 2011 http://www.durban.gov.za/Resource_Centre/Pages/default.aspx

eThekwini Municipality 2011 *Resource Centre* http://www.durban.gov.za/Resource_Centre/Pages/default.aspx accessed 12 March 2021

eThekwini Municipality 2013 *Durban Climate Change Strategy Waste and Pollution Theme Report*

eThekwini Municipality 2013 *Durban Climate Change Strategy Waste and Pollution Theme Report* available at http://www.durban.gov.za/City_Services/energyoffice/Documents/DCCS%20Waste%20and%20Pollution%20Theme%20Report.pdf accessed 22 April 2021

eThekwini Municipality Council 2014 http://www.durban.gov.za/City_Services/energyoffice/Pages/DurbanClimateChangeStrategy.aspx

eThekwini Municipality Council 2014 *Durban Climate Change Strategy* http://www.durban.gov.za/City_Services/energyoffice/Pages/DurbanClimateChangeStrategy.aspx accessed 12 March 2020

eThekwini Municipality 2016-2021 *Integrated Waste Management Plan*

eThekwini Municipality 2016-2021 *Integrated Waste Management Plan* available at durban.gov.za/City-Services/cleansing-solid-waste/Documents/eThekwini%20Municipality%20Integrated%20Waste%20Management%20Plan%202016%202021 accessed 7 April 2021

eThekwini Municipality 2017 *Integrated Development Plan*

eThekwini Municipality 2017 *Integrated Development Plans (IDPs)* available at http://www.durban.gov.za/City_Government/City_Vision/IDP/Pages/default.aspx accessed 7 September 2020

eThekwini Municipality 2018 *Energy Office Final Summary Document: eThekwini Greenhouse Gas Emissions Inventory*

eThekwini Municipality 2018 *Energy Office Final Summary Document: eThekwini Greenhouse Gas Emissions Inventory* available at http://www.durban.gov.za/City_Services/energyoffice/Pages/GHG-Inventory.aspx accessed 7 April 2021

eThekwini Municipality 2019 *Durban Climate Action Plan*

eThekwini Municipality 2019 *Durban Climate Action Plan* available at http://www.durban.gov.za/City_Services/development_planning_management/environmental_planning_climate_protection/CAP/Pages/default.aspx accessed 7 April 2021

eThekwini Municipality 2019/2020 *Annual Report*

eThekwini Municipality 2019/2020 *Annual Report* available at http://www.durban.gov.za/City_Government/Administration/city_manager/performance_management_unit/reports/Annua%20Reports/2019-2020%20EThekwini%20Municipality%20Draft%20Annual%20Report.pdf accessed 8 June 2021

eThekwini Municipality 2020 *Integrated Development Plan*

eThekwini Municipality 2020 *Integrated Development Plans (IDPs)* available at http://www.durban.gov.za/City_Government/City_Vision/IDP/Pages/default.aspx accessed 7 September 2020

eThekwini Municipality 2021/2022 *Service Delivery and Budget Implementation Plan (SDBIP)*

eThekwini Municipality 2021/2022 *Service Delivery and Budget Implementation Plan (SDBIP)* available at http://www.durban.gov.za/City_Government/Administration/city_manager/performance_management_unit/reports/SDBIP/Forms/AllItems.aspx accessed 10 August 2021

eThekwini Municipality 2021/2022 *Service Delivery and Budget Implementation Plan (SDBIP)* Quarter 2 Report

eThekwini Municipality 2021/2022 *Service Delivery and Budget Implementation Plan (SDBIP)* available at http://www.durban.gov.za/City_Government/Administration/city_manager/performance_management_unit/reports/ethekwinimunicipality/202021-2022/quarter/2/SDBIP.pdf accessed 1 April 2022

eThekwini Municipality 2021-2022 *City Manager Performance Agreement and Performance Plan*

eThekwini Municipality 2021-2022 *City Manager Performance Agreement and Performance Plan* available at http://www.durban.gov.za/City_Government/

Administration/city_manager/performance_management_unit/reports/Pages/Section-57-Performance-Contracts.aspx accessed 8 June 2021

eThekwini Municipality 2021-2022 *Deputy City Manager Trading Services Performance Agreement and Performance Plan*

eThekwini Municipality 2021-2022 *Deputy City Manager Trading Services Performance Agreement and Performance Plan* available at http://www.durban.gov.za/City_Government/Administration/city_manager/performance_management_unit/reports/Pages/Section-57-Performance-Contracts.aspx accessed 8 June 2021

Gowar 2015 https://documents.pub

Gowar A 2015 *DSD-INT 2015-Operational system for the eThekwini municipality* https://www.slideshare.net/Delft_Software_Days/dsd-int-2015-operational-system-for-the-e-thekwini-municipality-angus-gowar accessed 5 August 2021

ICLEI 2021 https://iclei.org/en/about_ICLEI_2.html

ICLEI 2021 *About us* https://iclei.org/en/about_ICLEI_2.html accessed 28 August 2020

ICLEI 2021 https://iclei.org/en/members-search.html?region=Africa

ICLEI 2021 *All ICLEI members* https://iclei.org/en/members-search.html?region=Africa accessed 28 August 2020

IPCC 2021 https://www.ipcc.ch/about/

Intergovernmental Panel on Climate Change (IPCC) 2021 *About the IPCCC* https://www.ipcc.ch/about/ accessed 22 July 2021

Local Government Climate Change Support Program http://www.letsrespondtoolkit.org

Local Government Climate Change Support Program available at http://www.letsrespondtoolkit.org accessed 28 August 2020

Local Government Climate Roadmap Secretariat 2021 http://old.iclei.org/index.php?id=1201

Local Government Climate Roadmap Secretariat 2021 *LG up to Bali - 2007* http://old.iclei.org/index.php?id=1201 accessed 24 February 2021

TutorBin 2019 https://medium.com/@tutorbin/greenhouse-effect-advantages-and-disadvantages-4d4f113ec61d

TutorBin 2019 *Greenhouse Effect: Advantages and Disadvantages* https://medium.com/@tutorbin/greenhouse-effect-advantages-and-disadvantages-4d4f113ec61d accessed 16 March 2021

UN 2020 https://www.un.org/en/library/unms?

United Nations (UN) 2020 *Member States on Record* https://www.un.org/en/library/unms? accessed 28 August 2020

UNCC 2002 https://unfccc.int/node/61201

United Nations Climate Change (UNCC) South Africa 2002 *Kyoto Protocol* https://unfccc.int/node/61201 accessed 16 February 2021

UNCC 2020 https://unfccc.int/kyoto_protocol#:~:text=The%20Kyoto%20Protocol%20was%20adopted,Parties%20to%20the%20Kyoto%20Protocol

United Nations Climate Change (UNCC) 2020 *What is the Kyoto Protocol?* https://unfccc.int/kyoto_protocol#:~:text=The%20Kyoto%20Protocol%20was%20adopted,Parties%20to%20the%20Kyoto%20Protocol accessed 22 February 2021

UNCC 2021 *Mechanisms under the Kyoto Protocol*

UNCC 2021 *Mechanisms under the Kyoto Protocol* available at https://unfccc.int/process/the-kyoto-protocol/mechanisms accessed 9 September 2019

UNCC 2021 https://unfccc.int/process/the-convention/history-of-the-convention#eq1

United Nations Climate Change (UNCC) 2021 *History of the Convention* https://unfccc.int/process/the-convention/history-of-the-convention#eq1 accessed 16 February 2021

UNEP 2010 *Waste and Climate Change: Global Trends and Strategy Framework*

United Nations Environment Programme (UNEP) 2010 *Waste and Climate Change: Global Trends and Strategy Framework* available at https://wedocs.unep.org/bitstream/handle/20.500.11822/8648/Waste&ClimateChange.pdf?sequence=3 accessed 23 July 2021

UNEP 2015 *Emissions Gap Report 2015*

United Nations Environment Programme (UNEP) 2015 *Emissions Gap Report 2015* available at https://www.unep.org/resources/emissions-gap-report-2015 accessed 26 July 2021

UNFCCC 2007 https://unfccc.int/resource/docs/publications/mechanisms.pdf

United Nations Framework Convention on Climate Change (UNFCCC) 2007 *The Kyoto Protocol Mechanisms: International Emissions Trading Clean Development Mechanism Joint Implementation* available at https://unfccc.int/resource/docs/publications/mechanisms.pdf accessed 22 February 2021

UNFCCC 2021 https://unfccc.int/process-and-meetings/the-paris-agreement//nationally-determined-contributions-ndcs/

United Nations Framework Convention on Climate Change (UNFCCC) 2021 *Nationally Determined Contributions (NDCs) The Paris Agreement and NDCs* https://unfccc.int/process-and-meetings/the-paris-agreement//nationally-determined-contributions-ndcs/ accessed 20 July 2021

Villarmea 2003 https://www.academia.edu/11097824/Local_Government_Powers_and_Functions_Definitions_and_Norms_and_Standards

Villarmea J 2003 *Local Government Powers and Functions – Definitions and Norms and Standards* https://www.academia.edu/11097824/Local_Government_Powers_and_Functions_Definitions_and_Norms_and_Standards accessed 8 June 2021

Waste Management Municipal Bylaws date unknown https://cogta.mpg.gov.za/policies/ByLaws/WasteManagByLaw.pdf

Waste Management Municipal Bylaws date unknown https://cogta.mpg.gov.za/policies/ByLaws/WasteManagByLaw.pdf accessed 8 June 2021

World Bank Group 2016 https://openknowledge.worldbank.org/handle/10986/24037

World Bank Group 2016 *Promoting Green Urban Development in African Cities: eThekwini, South Africa Urban Environmental Profile* available at https://open knowledge.worldbank.org/handle/10986/24037 accessed 7 April 2021

World Economic Forum 2018 *The Global Risks Report*

World Economic Forum 2018 *The Global Risks Report* 13th ed available at https://www3.weforum.org/docs/WEF_GRR18_Report.pdf accessed 5 March 2020

World Economic Forum 2019 *The Global Risks Report*

World Economic Forum 2019 *The Global Risks Report available at* https://www3.weforum.org/docs/WEF_Global_Risks_Report_2019.pdf accessed 5 March 2020