



Draft Green Building Development and Net-zero Carbon Building Policy for the City of Tshwane

28 June 2021



Table of contents

TITLE	2
DOCUMENT CONTROL.....	2
ABBREVIATIONS.....	3
1. INTRODUCTION AND PROBLEM STATEMENT.....	5
2. DESIRED OUTCOMES	5
3. STRATEGIC ALIGNMENT.....	5
4. REGULATORY CONTEXT	6
5. POLICY PARAMETERS	8
6. ROLE PLAYERS AND STAKEHOLDERS	8
7. POLICY DIRECTIVES.....	9
Green building principles	9
Climate adaptation.....	9
Net-zero carbon buildings and energy performance	9
8. IMPLEMENTATION PROGRAMME	12
9. MONITORING, EVALUATION AND REVIEW	13

TITLE

Green Building Development and Net-zero Carbon Building Policy for the City of Tshwane

DOCUMENT CONTROL

Prepared for: City of Tshwane Metropolitan Municipality Office of the Executive Mayor 2 nd Floor, East Wing, Tshwane House 320 Madiba Street, Pretoria Contact person: Sello Mphaga Tel: 012 358 6914 Email: sellomp@tshwane.gov.za	Prepared by: Council for Scientific and Industrial Research Smart Places Cluster PO Box 395, Pretoria, 0001 Contact person: Coralie van Reenen Tel: 012 841 4046 Email: cvreenen@csir.co.za
Version number:	Revision 1.2
Date:	28 June 2021
Document status:	For public participation
Previous document steps:	Early draft: 5 November 2020 First draft for departmental comment: 2 February 2021 Revision 1 for Mayoral Committee approval: 5 March 2021 Revision 1.1 for Mayoral Committee approval for public participation within the City of Tshwane (for language editing): 15 March 2021

ABBREVIATIONS

CAP	Climate Action Plan
DTI	Department of Trade, Industry and Competition
EUI	Energy use intensity
GHG	Greenhouse gas
IDP	Integrated Development Plan
NBR	National Building Regulations and Building Standards Act, 1977 (Act 103 of 1977)
NCCR	National Climate Change Response
NDP	National Development Plan 2030
SANS	South African National Standard

DEFINITIONS

In this document, the meanings of terms are to be understood in the context of and as defined in the National Building Regulations and Building Standards Act, 1977 (Act 103 of 1977). The following definitions are included:

By-law: Regulations developed by local authorities.

Competent person: A person who is qualified by virtue of his/her education, training, experience and contextual knowledge to make a determination regarding the performance of a building or part thereof in relation to a functional regulation or to undertake such duties as may be assigned to him/her in terms of the National Building Regulations (SANS 10400 Part A).

Energy use intensity: The total sum of energy consumed on-site divided by the building gross floor area.

Energy performance certificate: A certificate issued by an accredited body regarding an existing building that indicates the energy performance of that building. These are issued in accordance with the South African National Standard (SANS) 1544:2014 Energy performance certificates for buildings, which was published by the South African Bureau of Standards, in terms of the Standards Act, 2008 (Act 8 of 2008).

Green building: A building that, in its design, construction and operation, reduces or eliminates negative impacts and can create positive impacts on our climate and natural environment (World Green Building Council, 2020).

Greenhouse gas: Gases that contribute to the greenhouse effect by absorbing infrared radiation emitted by the earth's surface. Often reported in terms of carbon dioxide equivalents based on their global-warming potential.

Off-site renewable energy: Energy from renewable sources produced outside the boundaries of the building site.

On-site renewable energy generated: Energy from renewable sources produced at the building site.

Net-zero carbon building: A building that is highly energy-efficient by design, with the energy used drawn from renewable energy sources, whether on-site or off-site, so that there is a net-zero carbon emission on an annual basis.

Renewable energy: Energy generated from renewable resources. Examples of energy sources include sunlight, wind, rain, tides, waves and geothermal heat, biomass and biogas.

Site: Any erf, lot, plot, stand or other piece of land on which a building has been, is being or is to be erected.

Small-scale embedded generators: Power generation facilities, under 1 MW or 1 000 kW, which are located within the distribution network and produce electricity for their use or feed the excess back into the grid.

1. INTRODUCTION AND PROBLEM STATEMENT

Climate change caused by human activities results in higher global temperatures and extreme weather events. Projections for Tshwane indicate that average temperatures will rise up by 2 °C by 2030, the number of very hot days will increase and there will be a higher frequency of extreme rainfall events by the end of this century¹. Urgent action is therefore required to mitigate climate change and to adapt to the projected future conditions.

2. DESIRED OUTCOMES

Most of South Africa's greenhouse gas (GHG) emissions result from the consumption of fossil fuels, such as in the generation of electricity. Approximately 36% of all GHG emissions from the largest four metropolitan municipalities² are as a result of the energy used in the built environment. The long lifespan of buildings (40 to 120 years) and the rapidly growing building stock in South African cities make energy efficiency in buildings a key strategy in reducing GHG emissions.

Therefore, this policy aims to ensure that all buildings in Tshwane are climate-resilient, green buildings that incorporate energy efficiency and ensure that the pathway towards net-zero carbon buildings is embarked upon. Furthermore, buildings should be designed to be resilient to the impacts of climate change, such as flooding and drought. These ambitions will be achieved through the following built environment objectives:

- Climate resilience and adaptation in building design
- Operational energy efficiency and carbon neutrality
- Water efficiency in building design and operation
- Waste management in building construction and operation
- Non-motorised transport support in building design

A key target of the policy is to ensure that all new buildings in Tshwane are net-zero carbon by 2030 and that all existing buildings are net-zero carbon by 2050. The policy also seeks to ensure that buildings are resilient to the effects of climate change.

3. STRATEGIC ALIGNMENT

To help address this challenge, the City of Tshwane has developed a Climate Response Strategy and is developing a Climate Action Plan (CAP). The City of Tshwane CAP aims to transform Tshwane into a climate-resilient and carbon-neutral city by 2050. The CAP has ten envisaged outcomes with a number of planned programmes to achieve each, as shown in Figure 1.

¹ City of Tshwane Climate Response Strategy, 2018

² Largest four metropolitan municipalities in South Africa are the City of Cape Town, the City of Johannesburg, Ethekwini and the City of Tshwane (2020)

City of Tshwane - Climate Actions Overview

THEME 1: DRR & SAFETY	THEME 2: URBAN PLANNING	THEME 3: GREEN TRANSPORT	THEME 4: INFRASTRUCTURE	THEME 5: GREEN BUILDINGS	THEME 6: ECOLOGICAL INFRASTRUCTURE	THEME 7: WATER	THEME 8: ENERGY	THEME 9: WASTE	THEME 10: ENABLING ENVIRONMENT
Outcomes									
Outcome 1: Safe, Healthy, Prosperous and Climate Resilient Communities	Outcome 2: Climate-Smart Urban Planning and Design	Outcome 3: Resilient, Efficient and Climate-Smart Transport and Transit-Oriented Development	Outcome 4: Climate-Proof Infrastructure	Outcome 5: Net-zero carbon, Efficient and Climate-Resilient Buildings and Public Facilities	Outcome 6: Climate Resilient Ecological Infrastructure and Protected Natural Resources	Outcome 7: Access to Clean and Sufficient Water, Water Security and Water Efficiency	Outcome 8: An Energy-Smart and Secure City with Sustainable Access to Clean, Efficient and Affordable Energy for All	Outcome 9: A Zero-Waste Capital City that Promotes a Circular Economy	Outcome 10: Climate Change is Well Governed, Mainstreamed and Institutionalised in the City
Goals									
Goal: To promote the safety and health of communities in the face of climate change and extreme climate events	Goal: To promote climate smart spatial planning and development, land use management, growth and development control, as well as the innovative design of climate resilient urban spaces	Goal: To promote increased uptake of public transport, and a transition to cleaner mobility, supported by transit oriented development	Goal: To protect infrastructure from severe events, and to maintain, retrofit, replace and adapt infrastructure to reduce the impacts of climate-related events	Goal: To design and build new buildings, and adapt / retrofit existing buildings, ensuring that all buildings are carbon neutral and can withstand extreme climate events	Goal: Protect natural resources and enhance the City's natural ability to buffer climate change impacts	Goal: To ensure water security for all users and uses in the face of climate change, while reducing water demand, use, pollution and waste	Goal: To ensure energy security for all users and uses in the City given climatic changes, while increasing the efficient use and renewable supply of electricity	Goal: To promote circular economy initiatives, waste segregation and recycling to manage natural resources effectively, reducing impacts on the environment	Goal: To provide enabling mechanisms that ensure mainstreaming and the implementation of climate change actions
Programmes									
Investigate and identify Ways to Reduce Climate-related Disaster Risk	Climate-Smart Spatial Planning for Climate-Resilient Growth and Development	Ensure the Transport Network is Resilient to Climate Shocks	Identify Climate Risk Zones and Hotspots with Vulnerable City Infrastructure and Assets	Ensure All Existing and New Buildings are Net-Zero Carbon, Energy Efficient and Climate Resilient	Integrate Critical Biodiversity Areas and Ecological Support Areas into the Spatial Framework	One Water' Approach to Water Use and Water Management	Implement Energy Conservation and Demand-Side Response Measures	Promote Climate-Smart Waste Management: Minimization, Separation, Recycling and Transportation	Create an Enabling Institutional Environment
Promote Public Health and Safety in the Face of Climate Change and Extreme Climate Events	Innovative Urban and Township Design and Development	Promote City-Wide Use of Non-Motorised Transport (NMT)	Develop and Implement a Long-Term Infrastructure and Asset Maintenance Programme	Ensure All Existing and New City Owned Buildings and Facilities are Net-Zero Carbon, Energy Efficient and Climate Resilient	Conserve, Protect and Restore Natural Open Spaces, Ecosystems and Natural Resources	Protect and Conserve Water	Plan for Renewable Energy Implementation in the City	Drive a Shift towards a Circular Economy	Promote Cross-Sectoral Collaboration to Advance Mainstreaming
Increase Local Food Production to Improve Food Security	Ensure Climate-Smart Urban Areas by Developing/Amending, and Enforcing Regulation, and Monitoring Implementation	Promote Efficient and Affordable Public Transport in the City	Design, Retrofit or Replace Infrastructure to Ensure it is Climate Resilient	Promoting Green Buildings and Regulating New and Existing Buildings through By-laws and Policies	Enhance Natural Resources by Improving the Quality of Air, Soil and Water Resources	Diversify the Water Supply Mix	Procure Renewable Energy from Independent Power Producers (IPPs)	Ensure Proper Closure and Rehabilitation of Current Near-Capacity Landfill Sites	Raise Awareness among and Conduct Training for Officials, Politicians and Residents
Involve Communities, Raise Awareness and Conduct Training on Climate Change		"Green" the City's Fleet and Drive a City-Wide Shift towards Net-Zero carbon Transport			Enforce Compliance with Biodiversity and Natural Resources Guidelines and Regulation	Amend, Enforce and Monitor Water Policies and Guidelines	Diversify the Energy Mix and Promote Uptake of Clean and Small-Scale Renewable Energy		Establish a Well-Resourced Climate-Action Research, Graduate Training and Communications Programme

Figure 1: City of Tshwane Climate Action Plan overview

Outcome 5 of the plan (net-zero carbon, efficient and climate-resilient buildings and public facilities) includes programmes to promote green buildings and regulate new and existing buildings through by-laws and policies and to ensure all existing and new buildings are net-zero carbon, energy efficient and climate resilient. The City became a member of the C40 Cities Climate Leadership Group in 2014, which is an international group of cities that are committed to and collaborating on addressing climate change. As a member city and signatory to the Net-zero Carbon Buildings Declaration, the City of Tshwane has committed to targeting net-zero carbon energy for buildings in the City by 2050.

This Green Building Development and Net-zero Carbon Buildings Policy updates the Green Building Development Policy (2012) to include climate resilience and net-zero carbon energy targets for green building development.

The City of Tshwane Climate Response Strategy (2018) identifies green buildings as one of the ten game-changing climate response interventions for the City and calls on the Green Building Development Policy and Green Building Development By-law to ensure that buildings in Tshwane are energy-efficient and use sustainable and innovative design to address climate adaptation and mitigation, water conservation, manage waste sustainably and support low-carbon mobility.

4. REGULATORY CONTEXT

South Africa is a signatory to the Paris Agreement, an international agreement to mitigate climate change and limit global warming to below 2 °C above pre-industrial levels tabled at the 21st Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) (2015). Under this agreement and the National Climate Change Response (NCCR) White Paper (2011), South Africa is committed to reducing GHG emissions.

The motivation for net-zero carbon buildings is primarily driven by national and local climate change commitments. The NCCR White Paper outlines the National Climate Response Agenda, which includes the implementation of an “optimal mix” of mitigation strategies that can achieve the required emissions reductions while limiting job contraction and promoting the green economy. Section 8.4 identifies the regulation of commercial and residential building standards to enforce green construction practices. It also notes the key role of local government in the planning of human settlements and urban development and calls for climate change considerations to be integrated into municipal development planning tools.

The NCCR supports energy efficiency, as does the National Development Plan (NDP) 2030³ and the Department of Energy’s draft Post-2015 Energy Efficiency Strategy⁴, which seeks to achieve 20% and 37% energy use intensity improvements off a 2015 baseline by 2030, for residential and commercial buildings respectively by tightening building standards.

The NCCR also identifies renewable energy as a priority programme. The Department of Energy’s Renewable Energy White Paper (2003)⁵ commits to renewable energy development. Furthermore, the draft Integrated Resource Plan (2018) identifies demand reductions from small-scale embedded generation. The current regulatory framework enables this development (Electricity Regulation Act, 2006 (Act 4 of 2006), which establishes the legal framework for the delivery of electricity services) within conditions and tariffs determined by local distributors or municipalities. In terms of our current dispensation, the national government regulates the municipal generation and trading of electricity via the National Energy Regulator of South Africa (NERSA) in terms of the Electricity Regulation Act, 2006. The reticulation of electricity is also governed by the Electricity Regulation Act, 2006. In relation to reticulation, municipalities also hold law-making powers, in terms of their ability to make by-laws governing matters falling under Schedule 4 Part B of the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996).

Moreover, the Department of Trade, Industry and Competition is the custodian of the National Building Regulations (NBR), governing building design to ensure a minimum uniform standard. In 2011, Part X (environmental sustainability) was introduced to the NBR, supporting energy efficiency (Part XA) and, in future, will support other aspects such as water efficiency. The Department of Trade, Industry and Competition is committed to achieving greater efficiencies in line with the Department of Energy or the Department of Environment, Forestry and Fisheries’ commitments. The City will thus commit to drafting and reviewing building or green building by-laws to supplement and enhance the requirements described in South African National Standard (SANS) 10400 Part X.

³ National Development Plan 2030 (https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf)

⁴ Post-2015 National Energy Efficiency Strategy (Draft), Department of Energy, RSA, 2016, available at <https://cer.org.za/wp-content/uploads/2017/01/National-Energy-Efficiency-Strategy.pdf> [January 2021]

⁵ White Paper on the Renewable Energy Policy of the Republic of South Africa, Department of Minerals and Energy, RSA, 2003, available at https://www.gov.za/sites/default/files/gcis_document/201409/261691.pdf [January 2021]

These national standards and acts form an important start, but further action is needed to close the remaining gap in order to achieve net-zero carbon new buildings by 2030, as set out in South Africa's NDP 2030⁶. Consequentially, one of the key purposes of this policy is to reduce buildings' carbon emissions intensity to net-zero.

The principles contained in this policy and the related by-law should not result in standards that are lower than the minimum standards of the NBR. Should any changes be made to the NBR (and SANS 10400) result in the principles of this policy or the related by-law being of a lower standard, then the principles of the NBR (and SANS 10400) are to be applied.

The City of Tshwane established the City Sustainability Unit (CSU) in 2013 to address issues of climate change and sustainability. Sustainability in the built environment, among other initiatives, is driven by this unit. Strategic planning for the City is guided by the Integrated Development Plan (IDP) (2017–2021). One element of the IDP is the provision of good-quality services and the protection of the environment. This relates to the built environment in that buildings need to be environmentally sensitive and include efficient services. The City's Climate Response Strategy and CAP address a broad range of areas of mitigation and adaptation, including spatial planning, mobility, waste management, water management and energy. While all these (and other) factors are interlinked, this policy only focuses on the smallest element of the city – the building and its direct site.

This policy is to be implemented in built environment planning through the Green Building Development and Net-zero Carbon Buildings By-law, which will contain a schedule of detailed requirements for the greening of buildings in Tshwane, and through the City's Metropolitan Spatial Development Framework, the Land Use Scheme, the Land Use Management By-law and the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013).

5. POLICY PARAMETERS

The Green Building Development and Net-zero Carbon Buildings Policy applies to all new buildings and additions or alterations that require plan approval from the local authority, in accordance with the NBR. Aspects of green building development that are outside the boundary of the site of a particular development are not included in this policy, although the policy does seek to enable aspects beyond the site, such as non-motorised transport and recycling of waste. It is essential to integrate green buildings with sustainable urban planning and land-use practices, although these are not within the scope of this policy.

6. ROLE PLAYERS AND STAKEHOLDERS

This policy will be implemented in cooperation with the City of Tshwane Built Environment and Enforcement Division and the City Planning and Development Division in terms of an approved implementation plan.

⁶ National Development Plan 2030 (https://www.gov.za/sites/default/files/gcis_document/201409/ndp-2030-our-future-make-it-workr.pdf)

7. POLICY DIRECTIVES

The City of Tshwane undertakes to promote green building developments, to target all new buildings being net-zero carbon by 2030 and to ensure that buildings are resilient to the effects of climate change. The City commits to demonstrating leadership by ensuring that new buildings in Tshwane as well as additions and alterations to buildings are net-zero carbon energy by 2030 and adhere to green building design principles.

Green building principles

The City of Tshwane pursues the implementation of the following green building design principles:

- **Energy efficiency**, whereby buildings are designed in such a way to minimise and optimise the use of energy in building services. This entails passive design principles for thermal comfort and ventilation as well as suitable natural lighting and efficient building services. Net-zero carbon energy for new buildings by 2030 is targeted.
- **Water efficiency**, whereby water-saving devices and sanitary fittings are used, and greywater and rainwater are harvested for appropriate use.
- **Waste management**, whereby the recycling of demolition waste, construction waste and operational waste is facilitated through building design to divert waste from landfill sites.
- **Non-motorised transport support**, whereby buildings incorporate facilities that support pedestrians and cyclists, and electric vehicles are accommodated through the provision of charging facilities.

Climate adaptation

The City further undertakes to protect the environment and its residents from the harmful effects of climate change by employing principles of building and site design that –

- limit the urban heat island effect;
- prevent and/or mitigate erosion during flooding; and
- mitigate the effects of heat and drought.

Net-zero carbon buildings and energy performance

The City undertakes to achieve net-zero carbon buildings by 2050 by requiring buildings to reduce their energy use intensity (EUI) (kWh/m²/annum) over time as indicated in Table 1, and to use renewable energy from either on-site or off-site sources.

To achieve these targets, buildings shall be designed using passive design principles in order to minimise the amount of energy required for indoor climate control and ventilation, and building services shall be designed to optimise energy efficiency, after which renewable energy (whether on-site or off-site) shall be used to meet the occupational needs of the building.

Table 1 indicates the City's commitments under C40 to improve energy efficiency and reduce EUI in buildings in a phased approach over time. The targets are subject to review in response to improvements and innovations in technologies and in response to data regarding the actual energy consumption of buildings.

The City intends to develop a programme to monitor the operational energy use of buildings through metered data in order to support compliance with operational targets. This may also include the broad implementation of energy performance certificates. The use of renewable energy, whether on-site or off-site, shall be promoted to provide the energy requirements for buildings as outlined in Table 2.

Table 1: Proposed pathway to net-zero carbon buildings in Tshwane

Occupancy	Class of occupancy or building	Occupancy description	Energy use intensity (kWh/m ² /annum*)				
			2021	2025	2030	2040	2050
						To be reviewed before 2040	
Public gatherings	A1.1	Venues where people gather for sedentary behaviour	80	56	36	28	20
	A1.2	Venues where people gather for non-sedentary behaviour	120	84	54	42	30
	A2.1	Theatres and cinemas	95	67	43	33	24
	A2.2	Sport performance venues	120	84	54	42	30
Places of instruction	A3.1	Conference halls, auditoriums, lecture halls, instruction venues, research laboratories, intermediate-scale places of learning	95	67	43	33	24
Schools	A3.3	Urban, suburban and rural locations	55	39	25	19	14
Places of worship	A4.1	Large venues	50	35	23	18	13
	A4.2	Small venues	45	32	20	16	11
Places of detention	E1	Places of detention	55	39	25	19	14
Hospitals	E2	Large hospitals and medium- to	175	123	79	61	44

		short-stay facilities					
	E2	Day hospitals and clinics	90	63	41	32	23
	E3	Institutional (residential)	120	84	54	42	30
	E4	Healthcare	85	60	38	30	21
Retail	F1	Large shops (more than 250 m ²)	145	102	65	51	36
	F2	Small shops (less than 250 m ²)	80	56	36	28	20
Offices	G1	Large multistorey office buildings	95	67	43	33	24
	G1	Standalone buildings in office parks	80	56	36	28	20
	G1	Call centres	145	102	65	51	36
Residences	H1	Hotels	145	102	65	51	36
	H2	Dormitories	70	49	32	25	18
	H3	Domestic residences	70	49	32	25	18
	H4	Dwelling houses	70	49	32	25	18
	H5	Hospitality	70	49	32	25	18
Other		Category 1 buildings	70	49	49	49	49

Table 2: Renewable energy requirements to be introduced over time

Occupancy	Class of occupancy or building	Occupancy description	Percentage annual demand met through renewable energy			
			2025	2030	2040	2050
			Voluntary installation		Compulsory to meet net-zero requirement	
Public gatherings	A1.1	Venues where people gather for sedentary behaviour	25%	100%	100%	100%
	A1.2	Venues where people gather for non-sedentary behaviour	25%	100%	100%	100%
	A2.1	Theatres and cinemas	25%	100%	100%	100%
	A2.2	Sport performance venues	25%	100%	100%	100%
Places of instruction	A3.1	Conference halls, auditoriums, lecture halls, instruction venues, research laboratories, intermediate-scale places of learning	25%	100%	100%	100%
Schools	A3.3	Urban, suburban and rural locations	25%	100%	100%	100%

Places of worship	A4.1	Large venues	25%	100%	100%	100%
	A4.2	Small venues	25%	100%	100%	100%
Places of detention	E1	Places of detention	25%	100%	100%	100%
Hospitals	E2	Large hospitals and medium-to short-stay facilities	25%	50%	50%	100%
	E2	Day hospitals and clinics	25%	50%	100%	100%
	E3	Institutional (residential)	25%	50%	100%	100%
	E4	Healthcare	25%	50%	100%	100%
Retail	F1	Large shops (more than 250 m ²)	25%	100%	100%	100%
	F2	Small shops (less than 250 m ²)	25%	100%	100%	100%
Offices	G1	Large multistorey office buildings	25%	100%	100%	100%
	G1	Standalone buildings in office parks	25%	100%	100%	100%
	G1	Call centres	25%	100%	100%	100%
Residence	H1	Hotels	25%	100%	100%	100%
	H2	Dormitories	25%	100%	100%	100%
	H3	Domestic residences	0%	100%	100%	100%
	H4	Dwelling houses	0%	50%	100%	100%
	H5	Hospitality	0%	100%	100%	100%
		Category 1 buildings	N/A	N/A	N/A	N/A

8. IMPLEMENTATION PROGRAMME

The main instrument for implementing this policy in the City is the Green Building Development and Net-zero Carbon Buildings By-law. The City of Tshwane undertakes to review and implement the Green Building Development By-law (2012). The by-law will be implemented through the Built Environment and Enforcement Division and the City Planning and Development Division in order to enforce compliance with the green building design principles, net-zero carbon targets and climate change resilience principles. This will include a schedule of standards, some of which will be mandatory and some of which will be promoted to encourage uptake of the design of buildings that are green, net-zero carbon energy and climate-resilient. The schedule to the by-law may be updated from time to time to ensure continuous improvement in building sustainability and climate resilience.

The implementation, by means of the City of Tshwane Building Control Office and the City Planning and Development Division, in terms of the Green Building Development and Net-zero Carbon Buildings By-law, will include a site development plan, building plan and site inspection requirements. These will be detailed in Schedule I of the by-law. Implementation will be achieved through the site development plan and building plan approval processes.

Submission requirements may be amended from time to time by the City of Tshwane to support ongoing performance improvement in the built environment and alignment with related legislation or policies of the City or the country.

The City is committed to leading by example and applying the principles of this policy and the by-law in its own building stock. The City will further promote the principles of green buildings, climate adaptation and energy efficiency in buildings through marketing and communication to the public and by training officials in the Built Environment and Enforcement Division and the City Planning and Development Division.

9. MONITORING, EVALUATION AND REVIEW

The Green Building Development and Net-zero Carbon Buildings By-law will also allow for the future monitoring and evaluation of the operational energy use in buildings.

An implementation plan will be developed to ensure that the updated by-law is successfully implemented. The by-law will be implemented in a phased approach over a period of time, which must be set in the implementation plan. Successful implementation can be measured in terms of the quality of plan submissions and the level of application of the mandatory and promoted standards of the by-law.

The Green Building Development and Net-zero Carbon Buildings By-law will allow for the use of incentives managed by or promoted by the City and the development of a Green Building Development Certificate to encourage speedy uptake and implementation of the by-law. These incentives and the certificate must be developed and implemented as amendments to the by-law in the form of additional schedules in future. The intention of the certificate is not to compete with or be equivalent to any third-party green building rating schemes or certification systems, but to verify that a building complies with the by-law. The certificate may, from time to time, as established by the Incentive Scheme, render the holder of the certificate eligible for an incentive. This will be established by a specially appointed task team to develop the criteria and implementation plan for awarding the certificate (and incentives, if applicable).