



Steve Tshwete
Local Municipality

Green Building Guidelines
of
STEVE TSHWETE LOCAL MUNICIPALITY

The development of these Green Building Guidelines has been made possible through the Urban-LEDS Project. The Urban Low Emission Development Strategies project, implemented by ICLEI Africa in partnership with UN-Habitat and funded by the European Commission, has the objective of enhancing the transition to low emission urban development in emerging economy countries by offering selected local governments in Brazil, India, Indonesia and South Africa a comprehensive methodological framework (the GreenClimateCities methodology) to integrate low-carbon strategies into all sectors of urban planning and development.



_____ *Implemented by* _____ *in Partnership with* _____ *Funded by* _____



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Our journey towards implementing a low emission future is integrated into being the best community-driven local municipality, through the provision of sustainable services and development programs. While we recognise the importance of providing infrastructure, we also realise that buildings have a significant negative impact on our natural environment.

The compilation of these Green Building Guidelines will assist the residents, business owners and investors to review their planning applications through a “green lens”. Working with ICLEI Africa we have developed these guidelines to provide practical guidance on what is required and how it can be done.

I am looking forward to seeing more green buildings in Steve Tshwete in the near future and encourage everybody to use these guidelines and supporting documentation.

Mayor Mike Masina

As a global membership organisation, ICLEI – Local Governments for Sustainability supports over 1000 member local and other sub-national governments to chart their own unique journeys towards sustainable urban development.

ICLEI works with our members on diverse topics such as water and sanitation, climate change, low-carbon development, the green economy and biodiversity protection. We promote an integrated approach to urban planning which aims to strengthen service delivery to citizens while enhancing and sustaining local and global natural resources. The greening of urban infrastructure and of buildings in particular, presents an ideal avenue for ICLEI to partner with our members to make progress on a number of these topics in tandem.

Through our Urban-LEDS (Urban Low Emission Development Strategies) project, funded by the European Commission, and in partnership with UN Habitat, we have been able to assist two rapidly growing cities, by working with them to develop their green building guidelines. To this end we are

grateful to have brought on-board the expert team of MCA Urban and Environmental Planners, Steadfast Greening and Conscious Property Solutions, to assist us with this task. We are confident that the thorough outputs produced by this partnership will be of use to other municipalities in South Africa, and also to cities and sub-national governments further afield.

ICLEI-Africa encourages our member cities to adopt and adapt these guidelines in local contexts, and update them over time. We will also continue to support cities in their endeavours to implement the guidelines in a way that transforms their urban environments to be more liveable, prosperous, climate friendly and resilient.

Kobie Brand



Regional Director

ICLEI – Local Governments for Sustainability – Africa





***“ Do your little bit of good
where you are;
it's those little bits of good put
together that
overwhelm the world.”***

Desmond Tutu

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1 Introduction

1.1 Background

Today, it is widely accepted that human activities are contributing to climate change. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) estimated that between 1970 and 2004, global greenhouse gas emissions due to human activities rose by 70% (IPCC, 2007). As the majority of the global population now lives in urban areas, with this proportion rising to above 60% in South Africa (World Bank, 2015), cities have become areas of strategic focus to address climate change.

Cities are defined by their built environment. The built environment is made up of the roads and pathways used for mobility; the physical infrastructure which provides services, such as water, electricity, transport, sewerage and waste removal; the buildings which act as homes, offices and shops; and the governance structures which manage the relationships between these features.

South Africa currently faces a series of challenges, especially prevalent in urban areas, that have resulted in harm to the environment and to people.

The challenges include:

- More people are demanding more space and consuming more resources;
- Low density development has led to urban sprawl in this municipality and other areas;
- The development of buildings on prime agriculture land has led to irreversible soil damage;
- Large scale monoculture has led to biodiversity destruction;
- Urban sprawl has led to disconnected communities, reliance on private vehicles, habitat and biodiversity loss.

As cities continue to grow in population, physical size and density, increasing stress is placed on the built environment to carry the urban systems and associated processes that people depend upon. Consequently, climate change adaptation and mitigation measures need to be strategically focused on reducing the greenhouse gas emissions from activities associated with the growth and development of the built environment. This will enable the transition to a more sustainable development path.

The Green Building Council of South Africa highlights that, worldwide, buildings account for:

- 39% total energy used
- 70% electricity
- 40% CO² emissions
- 40% material consumption
- 65% municipal waste
- 12% water
- 25% timber harvested
- 50% ozone depleting CFCs

Green buildings offer the opportunity to significantly reduce these figures through implementing good design, construction and management practices at the building and precinct scales.

The Steve Tshwete Municipality has committed itself to the path of Low Emission Development (LED). A key component of this is the creation of an enabling and educational framework to assist players in the urban environment in the development and management of 'green' buildings. Green buildings are those that are resource efficient, benefit their occupants and contribute positively to the environment and their communities. Green buildings are the result of numerous processes, methods and technologies coming together at once. They inherently involve multiple stakeholders, interests and areas of expertise.

The aim of these guidelines is to provide an easy to use reference document for the municipality and building professionals and users. It is not intended to be exhaustive, but rather to address the key issues that offer the most widespread benefits in terms of operating costs, user amenity and the environment.

“ The destruction of the earth’s environment is the human rights challenge of our time. ”

Desmond Tutu



Incorporating green building principles into a development may have little or no additional capital cost if such principles are incorporated from onset. Other strategies can be retrofitted or added to a building as part of the normal maintenance cycle of the building, with no appreciable additional capital requirements. It should be noted, however, that some of the features that have the most lasting positive impact on a building, its resilience and future operating costs and internal quality can't be 'reverse engineered'

into the design and their absence will have lasting consequences on the environment and on building operations (for instance base building orientation or location).

Ultimately, this set of Green Building Guidelines is one of the tools needed and available to achieve better buildings and better spaces for people to live, work and play – to restore and enhance the environment, society and the economy.

1.2 The financial case for green buildings

While there is increasing development of green buildings in South Africa, there have been many misconceptions about the costs associated with this type of building when compared with conventional construction costs. The perceived cost of entry has been a major perceptual impediment to the widespread adoption of green building technologies. Many developers and private homeowners have been put off by fears of high costs and long pay-back periods where the value is realised by tenants and not the landlords. However, initiatives necessary to reduce resource consumption within the built environment are now gaining traction due to the rising costs of water and energy and a growing understanding of the need for environmental protection and restoration.

While not all green initiatives will add cost to the development of a building or precinct, all will contribute to the overall value of the building and a greater return on investment for the developer, building owner or investor. Certain aspects of green building, such as passive design, are the result of good decision-making and processes that allow for innovation while using the same budget needed for the construction of a conventional building.

Where green features or initiatives do require increased upfront costs, this is referred to as a 'green premium'.

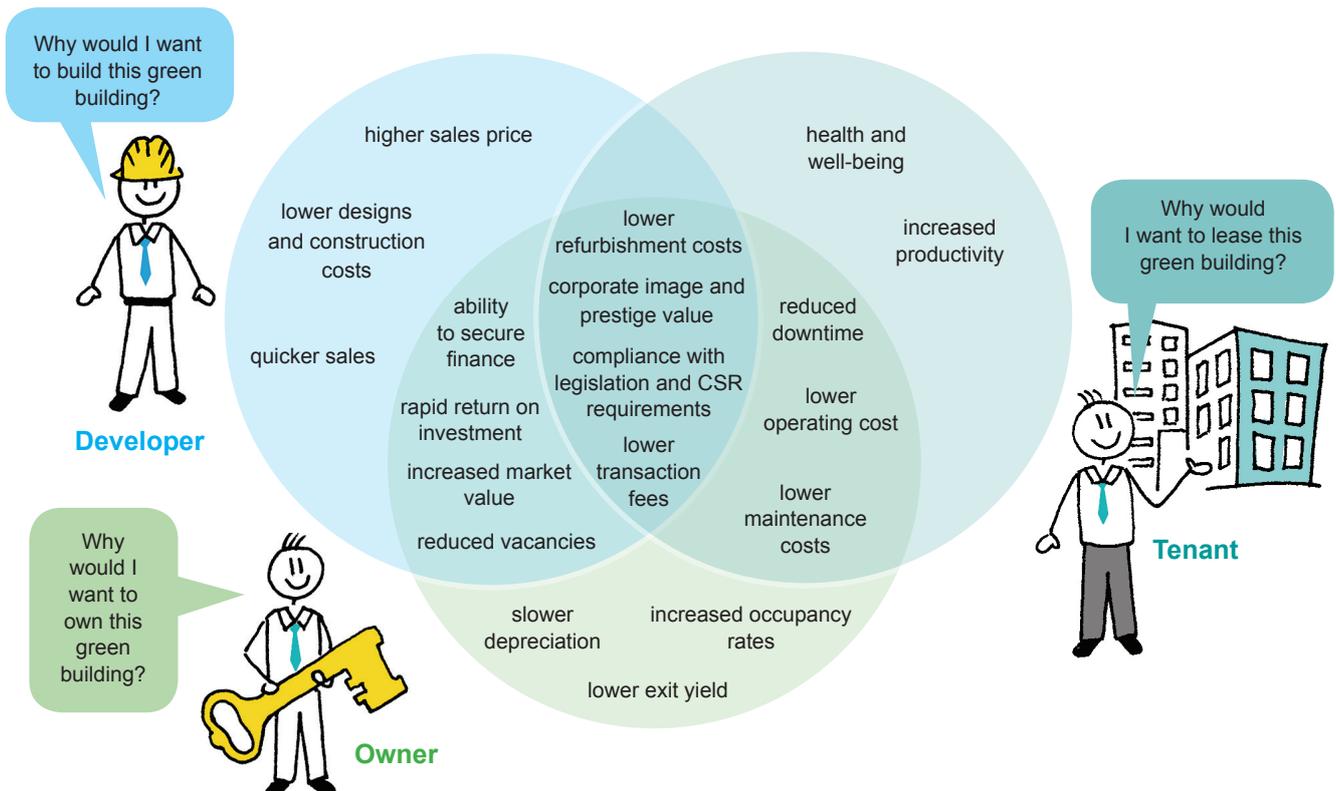
Some of the advantages now commonly agreed for green buildings include:

- Lower operating costs (particularly energy and water)
- Higher rentals and overall returns on assets
- Better marketability ("smart buildings", differentiated in the market)
- Lower risk, future-proofed buildings

- Increased ability to attract and retain talent (staff) and major desirable tenants (including government departments)
- Increased productivity, better retail sales, higher student pass rates, quicker hospital recuperation
- Responsible investing

Savvy developers are thus leaning towards buildings which are resource efficient, boast modern technologies and offer a good indoor environment for employees.

Figure 1: Reasons for developing, renting or owning a green building rather than conventional building



Source: The Business Case for Green Buildings, http://www.worldgbc.org/files/1513/6608/0674/Business_Case_For_Green_Building_Report_WEB_2013-04-11.pdf

1.3 Different shades of green

So what does this mean for you? Should all buildings be certified and can only certified buildings be considered green?

There are many shades of green and, in South Africa, traditional construction methods (such as mud huts with clay and dung floors) embody many of the principles which green building does today, such as the use of sustainable local materials and labour, climate appropriate design, and correct orientation. At a minimum no building should be constructed in South Africa any longer which does not take cognisance of its location (in terms of not developing on high-value ecological land, and the proximity to places of work or residence and local transport), orientation (to maximise morning sunlight but reduce penetration of harsh afternoon sunlight), and the ability to be reused over time. In addition, all buildings should demonstrate sensitivity to the limits of energy and water availability experienced in South Africa.

With this as a base, there are more elements that can be incorporated, such as natural ventilation, appropriate mechanical ventilation, energy efficient lighting and equipment, thermal mass to reduce heat loss and gain. Buildings need to be well managed, with ongoing waste minimisation and separation at source. On-site energy generation and water

collection and recycling should be implemented where possible. It is thus clear that there is not a single “green” prerogative, but a scale of greenness and a wide range of elements and practices which can be incorporated into any building at any stage of its lifecycle.

The South African government and local municipalities continue to develop and improve upon policies to guide well-informed and sustainable development. This has both led to and been enabled by an increased voluntary buy-in to the need for sustainable building practices by private developers. This is evident in the rapid uptake of green building certification in the private sector. Most of the green building certifications in South Africa have been through the Green Building Council South Africa (GBCSA), which offers third-party verification of design, new buildings, operational performance and interior fit-outs for a wide range of building types and communities.

A decade ago much debate existed in South Africa and the international community as to whether there was a real advantage in formal green building certification. It is now commonly accepted that the rigorous process of independent third party validation and accreditation holds extensive merit, and the uptake of formal certifications is increasing and no longer only associated with flagship developments.



1.4 How to use these guidelines

These guidelines have been designed to be used by everyone in the Steve Tshwete Local Municipality – property owners, built environment professionals, contractors, property developers and municipal officials working in the built environment.

These guidelines are aligned with the five focus areas as identified in the Low Emissions Development Strategy Transition Documents:

- Institutional transition: Including both management and government
- Spatial transition: Spatial planning, land use management and transport
- Energy transition: Energy efficiency and renewable energy
- Ecological transition: Resource management
- Economic transition: Economic development

These documents provided guidance with regard to the key topics that needed to be addressed within the



municipal area, to focus on actions that enable change and transition towards a greener economy and low emission development.

Within these focus areas, 12 categories were identified that specifically relate to green buildings and community-focused living environments. These categories are outlined below:

Figure 2: Green Building Guideline Categories

INSTITUTIONAL TRANSITION	SPATIAL TRANSITION	ENERGY TRANSITION	ECOLOGICAL TRANSITION	ECONOMIC TRANSITION
Management and Governance	Spatial Planning and Land Use Management Transport	Energy	Water Waste Internal Environmental Quality Pollution Biodiversity	Building Materials and Green Procurement Urban Agriculture

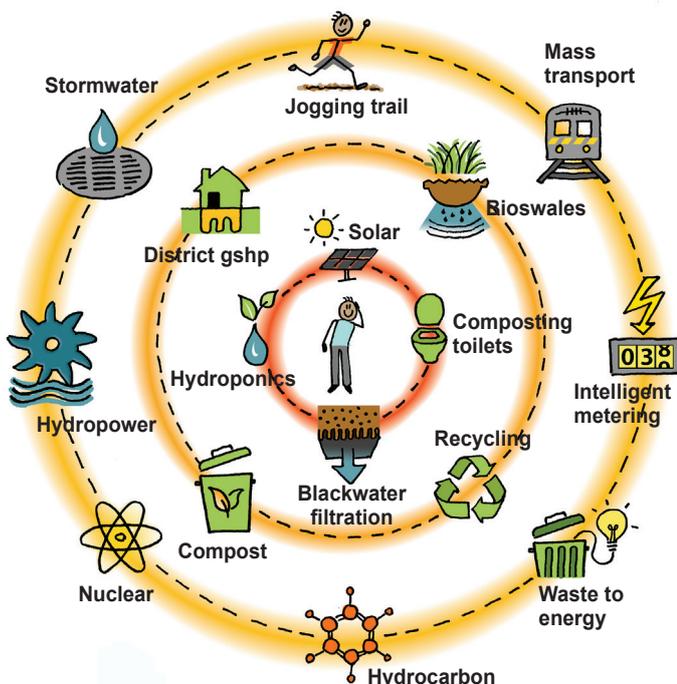
The following format is used to unpack the different categories, where applicable:

Introduction - Each category is introduced with an understanding of the system/resource in the municipality and the current challenges facing the municipality.

What changes do we need? – The change necessary to transition to low emission development and how the guidelines aim to achieve this is identified.

The detailed actions and initiatives included in these guidelines have been organised into relevant scales of the built environment, because a green building needs to be connected into broader systems and infrastructure services.

Figure 3: Scales of intervention in the Built Environment



Source: <http://www.holcimfoundation.org/Projects/energy-water-and-waste-efficient-military-installation-fort-le>

The **different scales** used in this guideline includes:

- a building
- a precinct or the local community

The process is also broken down into the **development phases of a building** – from design and construction through to the building management.

The municipality has a key role to play in creating an enabling and supporting environment for the transition to low emission development. This section has been compiled into a separate action plan to provide guidance on actions that can be undertaken by the municipality. This is to allow for reduced resource consumption and greenhouse gas emissions along with benefiting the natural environment and local socio-economic development.

How do we design our buildings? – Many short- and long-term environmental impacts of buildings can be reduced or potentially avoided with good green building decisions incorporated from the outset of designing a building. This is especially important when wanting to take hold of the no/low cost initiatives presented in these guidelines. This section of the guidelines looks at green building initiatives and actions that can be undertaken in the first stages of a building's concept design and incorporated throughout the design and specification process.

How do we construct our buildings? – Once a building design reaches site and construction begins, many direct environmental impacts are experienced. Green building decisions taken in this stage can help mitigate the impact of constructing the building on both the local and global environment. Good decision-making in this phase can have positive socio-economic benefits along with reducing the

environmental impacts. This section of the guidelines details the green building actions that can be undertaken within the construction phase of a building.

How do we manage our buildings? – The ongoing maintenance, operations and management of a building can have a significant environmental impact throughout the life of a building; where practices for monitoring and reduction of resource consumption are essential. When evaluating the total costs of a building's full lifecycle, the majority is spent in the occupation of a building. Green building practices applied here can therefore reduce the environmental impact of the building, while at the same time reducing operational costs, especially in the long term. This section of the guidelines details the green building actions that can be undertaken when managing a building, whether existing or new. This section also details green building considerations for retrofits and refurbishments of existing building stock.

How do we enhance our precincts? – Moving up from the scale of a building and looking to broader systems, both natural and urban infrastructure, the guidelines in this section indicate opportunities for green initiatives and interventions within a precinct. These are applicable to either existing or new precincts. These considerations also take advantage of economies of scale, which increase the feasibility and viability of green strategies as more people use them and there is more space to support them physically.

1.5 Greening the local economy

As Steve Tshwete moves towards low emission development, it is important to identify and create employment opportunities in the local, green economy. Many of the recommendations contained in various sections of these guidelines have associated benefits for the local economy. This can happen through the

local production of clean energy from renewable sources, an increase in the construction of green buildings supporting local jobs and communities, and choosing locally-made rather than imported goods and products (use local labour while developing local skills).

The green economy also includes the promotion of the municipality's local and cultural identity through offering unique tourism opportunities; the promotion of green buildings; education and awareness and green business support structures and mechanisms.

The green economy is not a subset of the current economy. It must be understood as a paradigm where economic growth can have environmental and social benefits by creating jobs while reducing risk and scarcities. The aim of this economic framework is to reduce, and possibly even reverse, the negative environmental and social impacts of unrestricted development. The green economy is enabled and supported by changing technology, evolving awareness and the rise of a social consciousness leading to the emergence of many new opportunities and ways of approaching human well-being (environmentally, economically and socially sustainable activities).

There are many opportunities to green the local economy through the design and construction of green buildings and precincts. Where applicable, these opportunities are identified in each category of these Green Building Guidelines which offer the opportunity for everyone in the municipality to contribute to growing an economy that benefits the environment and improves the livelihoods of residents.