

Public Works Green Building Policy

Launched by The Department
of Public Works

As the custodian of state properties, the Department of Public Works is the largest South African player in the property sector. As such, we have the responsibility to provide leadership in relation to green buildings and greening the economy. It is our responsibility to take decisive steps to ensure that our portfolio of state buildings reduces its environmental impact, is energy efficient, resource efficient and environmentally responsible.

The Department has implemented policy activities to minimise the environmental impact of its buildings, including steps to reduce energy and water usage within state properties, the introduction of renewable energy technologies, as well as the design and construction of best practice green buildings. Buildings such as the new offices of the Department of Environmental Affairs in Pretoria, the new Sisonke District Office in KwaZulu-Natal and others demonstrate our commitment to green buildings.

The policy is a milestone in government's trajectory of green buildings and a green built environment. The Green Building Policy is also a demonstration of South Africa's support to ongoing local and international commitments, including the Green Economy Accord, the South African National Climate Change Response White Paper and the National Energy Efficiency Strategy.

The Green Building Policy sets out the principles by which the Department of Public Works will develop, maintain and operate our portfolio of buildings and reduce its impact on the environment. Furthermore, the Policy also lays the basis for the creation of green jobs, for up-skilling and training of participants, and the development of improved working and living conditions.

This Policy is a collaborative effort between my Department of Public Works and all the provincial Public Works Departments. It is my vision that this Green Building Policy will also be adopted by all provincial Public Works Departments as well as other government institutions. Working together, we continue to strive for a sustainable built environment.

HON. THEMBELANI THULAS NXESI
MINISTER OF PUBLIC WORKS



Minister of Public Works,
Thembelani Thulas Nxesi



Deputy Minister of Public Works,
Jeremy Cronin



SOME BACKGROUND TO THE POLICY

South Africa has come a long way in putting in place legislation and programmes aimed at addressing the impact of our economic activity on the environment. A number of studies, including research by the United Nations Environment Programme's Sustainable Buildings and Climate Initiative (UNEP-SBCI) found that the built environment is responsible for 40% of annual energy consumption and up to 30% of all energy related greenhouse gas (GHG) emissions, whilst the same sector is responsible for 12% of fresh water use and 40% of annual solid waste. Research has however shown that this sector also has the highest potential to cut emissions.

The Department of Public Works (DPW) has a portfolio of over a hundred thousand buildings at national level, including more buildings in the custodianship of provinces. In this regard, the Public Works as a family also needed to provide strategic leadership in support of the National Energy Efficiency Strategy (NEES), the National Water Act 36 of 1998 – currently under review, and the National Environmental Management: Waste Act 108 of 2008, amended in 2014. The DPW in partnership with the Council for Scientific and Industrial Research (CSIR) then introduced a Green Building Framework, launched in 2011 during COP17 in Durban. After a number of processes after that, the Public Works Green Building Policy was approved and launched in October 2018.

AIMS AND OBJECTIVES

The Green Building Policy is presented on the basis that the built environment sector has a direct influence on greenhouse gas emissions. Lights, heating and cooling systems contribute to carbon emissions. Therefore, through this policy, DPW will mitigate carbon emissions and adapt the sector to a green built environment by providing a base for development of the green building programme to ensure existing and new government buildings are environmentally responsible. DPW is the largest South African player in the property and construction sectors, and therefore has the responsibility to provide leadership in relation to green buildings and the green economy.

The Public Works Green Building Policy is aligned to a number of legislations including:

- The National Water Act (1998)
- The National Climate Change Response White Paper (2001)
- The National Energy Efficiency Strategy (2005, 2012)
- The South African Long Term Mitigation Scenarios (LTMS) (2007)
- The Government Immovable Asset Management Act (GIAMA) (2007)
- The National Framework for Sustainable Development in South Africa (2008)
- The DPW National Framework for Green Building (2011)
- The National Water Resource Strategy (2013)
- The National Immovable Asset Maintenance Management (NIAMM) Framework (2015)

The overall objective of the Green Building Policy is to ensure that activities of the construction and property industries actively support the green economy and improve the quality of the natural environments by improving the performance of the asset in terms of energy and water usage, application of green procurement, enhancing social well-being, creating new and decent green jobs and facilitating the reuse of materials and elements at the asset's end-of-life stage.

THE POLICY SPECIFICALLY AIMS TO:

- Provide guidelines on the implementation of green building programmes
- Provide steps that will enable government to transition to a low carbon economy
- Contribute to the implementation of energy efficiency programmes
- Provide parameters for the integrated planning and design of green building programmes, thus promoting sustainable development
- Contribute towards initiatives aimed at transitioning to a climate resilient and low-carbon economy
- Contribute to the global effort to stabilise and reduce greenhouse gas emissions by applying appropriate mitigation actions to climate change
- Contribute to dematerialising the economy and promotion of air quality
- Provide for institutional arrangements to enable the implementation of the DPW Green Building Programme through establishing a Green Building Project management Office (PMO)
- Strengthen intergovernmental cooperation in all spheres of government through advocating for the establishment of Green Building PMO counterparts in provincial Public Works Departments
- Promote social-equity through weaving principles of Indigenous Knowledge Systems (IKS) into green building, with a focus on African historic, contemporary, scientific and cultural built epistemologies
- Contribute to the National Development Plan (NDP) Vision 2030 and achievement of local designation and support to black industrialists as championed by the Department of Trade and Industry (DTI).

The Green Building Policy will be applied by all custodians and users in line with the Government Immovable Asset Management Act (GIAMA), with a view to developing initiatives that seek to strike a balance between the construction and property functions and principles that promote creation of suitable development. The scope will, inter alia, include the promotion of a uniform, integrated sustainable planning approach; identification of relevant techniques that promote use of natural resources in the achievement of green building principles (e.g. locally available natural materials); and ensure the achievement of excellent energy, water, and waste management in government buildings/structures.



The role players

Green buildings are impacted on by many role players, both internationally and within South Africa. A summary of key role players within the South African context include:



1.1. Department of Public Works

As the custodian of all immovable assets vested in the national government, which are not otherwise vested in the custodianship of other departments through legislation, DPW is central to providing leadership and practice with regard to green buildings in both the public and private sectors. DPW is the custodian of the Green Building Policy.

1.2. Department of Energy

As the custodian of the National Energy Efficiency Strategy, the Department (as well as its South African National Energy Development Institute, SANEDI) has a key role in influencing energy efficiency in buildings in South Africa.

1.3. Department of Environmental Affairs

The Department of Environmental Affairs is the custodian of South African climate change and sustainable development policies which impact on the built environment.

1.4. National Treasury

National Treasury is the custodian of the Carbon Tax Policy Paper which seeks to introduce a tax on Scope I carbon emissions (i.e. source emissions) in support of reducing climate change. It is estimated that the carbon tax could result in an increase of around 5c/kWh for electricity, and the intent is that this tax will encourage energy efficiency in, amongst others, buildings.

1.5. Department of Trade and Industry

The DTI is the custodian of the National Building Regulations and Building Standards Act, which provides for the establishment of the National Building Regulations (the NBRs). The NBRs are supported by a number of South African National Standards, including SANS 10400XA; Environmental Sustainability.

The DTI is also custodian of the Industrial Policy Action Plan (IPAP) which seeks to upscale productivity and industrial diversification of our economy. It has a strong focus on the green economy, including investment in waste management and recycling.

1.6. Department of Water and Sanitation

As custodian of the National Water Act and the National Water Resource Strategy, the Department of Water and Sanitation has a key role in influencing water efficiency in buildings and water quality of effluents.

1.7. Provincial and Local Government

Several provincial and local government institutions, and related institutions, have and are playing a key role in furthering green buildings through local initiatives – including initiatives at the Gauteng Department of Infrastructure Development, City of Cape Town, and others. Many of these initiatives focus on specific interventions such as solar water heaters, solar energy and renewable energies.

1.8. Agrément South Africa, CBE and the CIDB

Agrément South Africa (ASA), the Council for the Built Environment (CBE) and the Construction Industry Development Board (CIDB) all play an important role with respect to green buildings in terms of the certification of non-standardised building products and systems; promoting and maintaining a sustainable built environment and natural environment, and promoting ongoing human resource development in the built environment.

1.9. Academic Institutions and the CSIR

Academic institutions and the CSIR have played a significant role in research and development that has supported the development of green buildings in South Africa and internationally. Substantial expertise exists at the CSIR and at several academic institutions in energy efficiency and green buildings in general.

1.10. Green Building Council of South Africa

The Green Building Council of South Africa (GBCSA) was established in 2007 with the aim of promoting, encouraging and facilitating green building in the South African property and construction industry, by focusing on advocacy and promotion of green buildings, the development and implementation of green building rating tools, education and training and by providing green building resources including access to technical manuals, guides, research, news and case studies.

1.11. Property Sector and Green Building Industry

The property sector and green building industry, including property developers, facilities managers and products, equipments and materials manufacturers and suppliers are key stakeholders in the provision of green buildings.



Policy outcomes and benefits

The fundamental benefit of the Green Building Policy is to integrate the concept of sustainability into immovable asset management in public buildings. The main outcomes and benefits of the policy are that it:

- Pro-actively informs the development of plans and programmes
- Identifies the opportunities and constraints which the environment places on development
- Identifies key strategic areas of green building interventions
- Provides integration of the principles of green building across the entire property portfolio under the custodianship of DPW
- Improves the way in which cumulative effects can be realised, for example, climate change adaptation and mitigation strategies and Black Economic Empowerment
- Focuses on the maintenance and enhancement of a chosen level of environmental and social quality, rather than on minimising individual impacts
- Utilises the immovable asset-backed mandate of DPW to ensure that the green building trajectory is a catalyst for sustainable development equity, job creation, technology transfer, and the broader economic empowerment

Furthermore, the Green Building Policy communicates DPW's expectations of, and commitments to, the South African property sector in general and specifically with regard to buildings which DPW leases from the private sector.

Stakeholder relations will be guided by signed Service Level Agreements (SLAs) or Protocols in accordance with the Inter- Government Relations Act No 13 of 2005.





The Sarah Bartmann Centre of Remembrance



The Sarah Bartmann Centre of Remembrance is situated next to the grave of Sarah Bartmann in Hankey in the Eastern Cape. The grave is also part of the project. The project has, among other features, a museum next to the grave, a story telling place and a symbolic garden. Indigenous species will be used in the garden with a significant proportion of planting to be sourced from plants rescued from site. The expected completion date is in 2019. The project uses a natural air conditioning and cooling system, instead of mechanical ventilation. The design uses plenty of natural light and most lights will be controlled by occupancy and motion sensors. The project boasts two boreholes and a 260kℓ capacity of storm water harvesting for toilets and irrigation.

ENERGY EFFICIENCY, RENEWABLE ENERGY AND COMFORT

Night-time cooling strategy

Classrooms have been designed to use a passive night-time cooling strategy based on an exposed high thermal mass structure and ventilation design. Ceilings have been dropped to expose thermal mass to night airflow and fenestration is designed to allow airflow at night, while maintaining security.

Rock bed and stack effect

Passive environmental control strategies include a rock bed combined with a stack effect system, designed to maintain thermal comfort and ventilation within the auditorium in a highly efficient manner.

Breeze paths

Breeze paths have been designed between and through spaces to enable natural air flow to enhance cooling, and thermal comfort within internal and external occupied spaces.

Renewable energy and back-up power

A 30kW photovoltaic panel system will provide ongoing power for between 20 to 40% of the power requirements of the building. A UPS system will provide backup power for 2-3 hours in key areas.

Energy efficient lighting

Low-level LED lighting linked to motion sensors is used to light external paths. This will be off when paths are not in use, avoiding light pollution. Energy efficient LED and CFL lamps are used internally.

Energy efficient water heating

Solar water heating is used to heat water in dormitories and kitchens.

Solar shading

The roof, wattle lathe shades, and landscaping design have been designed to shade glazing and reduce unwanted heat gain. Pathways and external seating are selectively shaded with wattle lathes and vegetation.

WATER EFFICIENCY AND RAINWATER HARVESTING

Rainwater harvesting

Surface run-off and roof water is captured and directed to an 180kℓ underground sump and stored for uses such as cleaning and irrigation. Landscaping, berms and swales are used to maximise on-site retention of storm water and avoid erosion. Dual flush WCs and water efficient taps and shower fittings are used.

ENVIRONMENTAL IMPACTS

Landscaping

Indigenous species will be used with a significant proportion of planting to be sourced from plants rescued from site. The design, material and component selection will minimise the effects of corrosion, specifically in relation to windows, structural frames, ironmongery, fixings, PV and solar water heater structures.

Natural, locally-available materials and components have been selected. Materials with harmful chemicals or other impacts have been avoided. Selection of timber products, paints, adhesives and carpets, in particular, avoid formaldehyde and Volatile Organic Compound content. +

National English Literary Museum (NELM)

NELM is located in Makhanda and houses extensive archival material relating to Southern African English Literature. The project design brief called for the building to be a landmark, fitting the site context and building typology, as well as a functional space with cultural and educational significance, informative organisation and design, social upliftment and community acceptance. Chosen as a pilot for the GBCSA Green Star Public and Educational Buildings rating tool, the project also had to have very limited environmental impact, and green principles were top-of-mind from the outset.

NELM's facilities include exhibition venues, archives, libraries, an auditorium, offices, flexible conference and classroom facilities, an open-air public amphitheatre, a storytelling area and leisure walkways. The building is specifically orientated on an east-west axis, with large stone gabions on the north and west facades that act as a heat sink, keeping indoor temperatures cooler by day and releasing some of the embodied heat back into the structure by night. A valuable passive design feature is the large roof garden above the archives, which faces the adjacent residential properties, enhancing the building's picturesque setting. Local materials and labour was specified where available, to provide the community with a sense of ownership and generate economic upliftment.

EFFECTIVE ENERGY AND WATER SAVINGS

The air is pre-conditioned by the building, meaning the dual HVAC system does not need to operate at full capacity. It simply controls the indoor temperature within very fine tolerances. This reduces mechanical heating and cooling costs. Additional energy strategies were targeted to reduce the building's overall energy consumption, such as high-frequency ballasts, occupancy lighting sensors, LED lighting, heat pumps and a Building Management System (BMS) that

monitors consumption and optimises the effectiveness of service systems.

The environmental wellbeing of occupants is enhanced through uninterrupted external views and accompanying natural light, individual climate control and lower noise levels, and the reduction of materials emitting volatile organic compounds (VOC).

The water saving strategies employed in the facility include rainwater used for dual flush toilets (using only 3.6ℓ per flush) and low-flow taps reduce water consumption. The urinals are waterless and touchless sensor taps are self-charging, meaning that the flowing water generates sufficient power to recharge the sensor. Externally, the 100% xeriscaped landscaping was irrigated with rainwater for the first 12 months only.

REUSED AND RECYCLED

Care has been taken to use recycled content where possible, with 90% of steel reinforcing and structural steel having been recycled, rubber flooring made from recycled car tyres, carpets produced largely from recycled plastic bottles and cocomosaic acoustic tiles.

Other green initiatives have been included where possible, from locally manufactured clay bricks and a 40% reduction of the quantity of Portland cement as an average across concrete mixes, through to Forest Stewardship Council (FSC) Certified timber, and safe and convenient cycling and pedestrian routes, along with storage and shower facilities for employees who cycle to work.

For more information on the Public Works Green Building Programme, contact:

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