



DPW GREEN BUILDING POLICY

1.	Introduction	1
2.	Sustainable Building and Construction	2
2.1	Sustainable Development	2
2.2	Green Buildings	3
2.3	Sustainable Buildings	4
2.4	Role Players	4
3.	Background and Context to DPW Green Building Policy	6
3.1	Public Sector Leadership	6
3.2	Energy Performance Certificates (EPCs)	9
3.3	Water Performance Certificates (WPCs)	10
3.4	Eco-Labeling of Building Products and Materials	11
3.5	Energy, Water and Waste Management Plans (EWWMPs)	12
3.6	National Building Regulations; Environmental Sustainability (SANS 10400X)	12
3.7	Green Building Rating Tools	14
3.8	Green Procurement and Green Leases	15
3.9	Monitoring	15
4.	DPW Green Building Policy	17
	Annexure 1. Model Green Building Policy	20



1. INTRODUCTION

This document sets out DPW's policy for greening its own property portfolio, and aligns with:

- South Africa's commitments to the Rio Declaration (Agenda 21) and the Kyoto Protocol;
- the *National Energy Efficiency Strategy* which sets an energy efficiency improvement target of 15% by 2015 for the commercial and public building sector^{1,2};
- the *National Climate Change Response White Paper*³; and
- the *DPW National Framework for Green Building*⁴.

An overview of this document is given below:

- Section 2 provides a brief background and context to sustainable development and green buildings;
- Section 3 provides a background and context to DPW's Green Building Policy;
- Section 4 presents DPW's *Green Building Policy*; and
- Annexure 1 presents a model *Green Building Policy* that can be adapted by other organs of state and which aligns to DPW's *Green Building Policy*.

1 DEA (2005). *Energy Efficiency Strategy of the Republic of South Africa*. Department of Minerals and Energy, March 2005.

2 DoE (2012). *Draft Second National Energy Efficiency Strategy Review*. Gazette Notice 1000 of 2012, Gazette 35920. Department of Energy, November 2012.

3 Government of SA (2011). *National Climate Change Response White Paper*. Department of Environment, October 2011.

4 DPW (2011). *A National Framework for Green Building*. Department of Public Works, January 2011.



2. SUSTAINABLE BUILDING AND CONSTRUCTION

2.1 Sustainable Development

Sustainable building and construction is a sub-set of sustainable development – namely about meeting the needs and aspirations of people (especially the poor) in a manner that does not impede future generations from being able to meet their own needs and aspirations.

The three components of sustainability are⁵:

- *Environmental sustainability*, which requires that natural capital remain intact. This means that the source and sink functions of the environment should not be degraded. Therefore, the extraction of renewable resources should not exceed the rate at which they are renewed, and the absorptive capacity of the environment to assimilate wastes should not be exceeded. Furthermore, the extraction of non-renewable resources should be minimised and should not exceed agreed minimum strategic levels.
- *Social sustainability*, which requires that the cohesion of society and its ability to work towards common goals be maintained. Individual needs, such as those for health and well-being, nutrition, shelter, education and cultural expression should be met.
- *Economic sustainability*, which occurs when development, which moves towards social and environmental sustainability, is financially feasible.

Sustainable development is also increasingly being defined in terms of the water, energy and food (WEF) security nexus, namely that the three sectors of water security, energy security and food security are inextricably linked and that actions in one area more often than not have impacts in one or both of the others⁶:

Water security	The elements of water security are: (1) water access; (2) water safety; and (3) water affordability so that every person can lead a clean, healthy and productive life, while ensuring that the natural environment is protected and enhanced.
Energy security	The elements of energy security are: (1) continuity of energy supplies relative to demand; (2) physical availability of supplies; and (3) supply sufficient to satisfy demand at a given price.
Food security	The elements of food security are: (1) food availability: influenced by production, distribution and exchange of food; (2) access to food: including affordability, allocation and preference; (3) utilization: nutritional value, social value and food safety (4) food stability over time.

Sustainable development is also closely linked to the concept of the green economy, namely an economy that results in improved human well-being as well as social equity, while significantly reducing environmental risks and ecological scarcities⁷.

Buildings, and the built environment, are central to the concepts above of sustainable development, the WEF nexus (and specifically energy consumption and energy security) and the green economy⁸.

5 Gilbert, R, Stevenson, R., Girardet, H, & Stren, R, (1996). *Making Cities Work*. Earthscan, London.

6 IISD (2013). *The Water–Energy–Food Security Nexus: Towards a Practical Planning and Decision-Support Framework for Landscape Investment and Risk Management*. Livia Bizikova, et al. International Institute for Sustainable Development, February 2013.

7 UNEP (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. United Nations Environment Programme, accessible at www.unep.org/greeneconomy.

2.2 Green Buildings

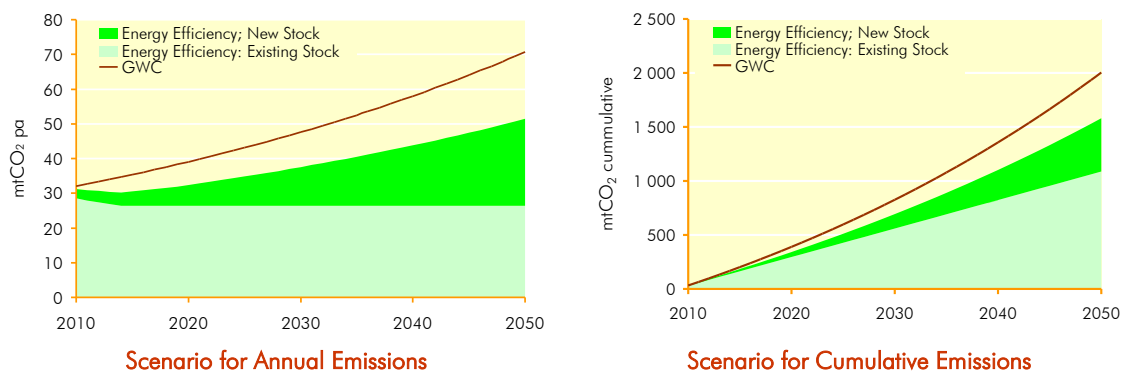
The concept of green buildings, sustainable buildings, or sustainable construction is broad – but it is generally viewed as the building structure and the construction process that is environmentally responsible and resource-efficient throughout the whole life-cycle of the building, from inception and design, through the operation, maintenance and refurbishment of the buildings, and through to deconstruction of the buildings. A similar definition (after GBCSA⁹) recognises that:

green building incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and people. Green buildings are energy efficient, resource efficient and environmentally responsible.

In general, the largest impact on life-cycle decisions impacting on green buildings is made at the planning and design phase of a building – and hence it is important that the design of a building reflects the desirable sustainability norms, standards and best practices. Key to this is green building codes of practice, green building rating tools and energy efficiency standards, etc. In this regard, international practice is now recognising and promoting a ‘Deep Path’ transformational change agenda to enabling an 80% global reduction of thermal energy demand from buildings by 2050¹⁰. Key to this is:

- net-zero energy buildings (nZEB);
- increasing stringency and compliance with building energy codes;
- deep retrofitting of existing buildings;
- mandatory disclosure of energy performance; and
- integrated renewables.

One of the greatest challenges therefore with regard to green buildings is that of dealing with the existing building stock – much of which is resource inefficient. In this regard, a report on greenhouse gas (GHG) emissions from the building sector in South Africa shows that under likely scenarios of introducing energy efficiency requirements for buildings, the annual emissions from the existing building stock by 2050 will still exceed that of new buildings constructed¹¹.



8 UNEP (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. Chapter 9, Buildings: Investing in Energy and Resource Efficiency.* United Nations Environment Programme, Sustainable Building and Climate Initiative, accessible at www.unep.org/greeneconomy.

9 GBCSA. Green Building Council of South Africa, www.gbcsa.org.za

10 GBPN (2012). *Buildings for Our Future, The Deep Path for Closing the Emissions Gap in the Building Sector.* Green Buildings Performance Network, accessible at www.gbpn.org/reports.

11 UNEP-SBCI (2009). *South African Report on Greenhouse Gas Emission Reduction Potentials from Buildings; A Discussion Document.* United Nations Environment Programme, Sustainable Building and Climate Initiative. Undertaken by the cidb, accessible at www.unep.org/sbci.

Retrofitting of existing buildings to enhance their energy and water efficiency is therefore a key focus around the world. However, retrofitting of buildings is often complex, and international experience shows that it is necessary to avoid any possible lock-in to inefficient retrofits with long-term consequences. In fact, international experience shows it may in fact even be desirable to delay retrofitting rather than locking-in to inefficient retrofits.

2.3 Sustainable Buildings

Green buildings are a sub-set of sustainable buildings, and are predominantly associated with the environmental sustainability component associated with sustainable building and construction, while the broader issues of sustainability and the green economy are associated with sustainable buildings. As such, this DPW *Green Building Policy* focuses primarily on the environmental sustainability component of green buildings, and not the broader social and economic issues of sustainability.

Notwithstanding this, it should be noted that the social issues of sustainable buildings are in fact well entrenched within the public sector through, amongst others through:

- the *Preferential Procurement Policy Framework Act* (2011);
- the *Guidelines for the Implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme* (EPWP)¹² (which includes the SANS 1921-5: 2004 specification Part 5: *Earthworks activities which are to be performed by hand*);
- *BBBEE Construction Codes of Good Practice*¹³;
- *cidb Standard for Indirect Targeting for Enterprise Development*¹⁴;
- *cidb Standard for Developing Skills on Infrastructure Contracts*¹⁵; and
- *cidb Practice Note, Balancing Delivery, Development and Empowerment*¹⁶.

In fact, the GBCSA has recently launched its Socio-Economic Category PILOT Tool¹⁷, and the EPWP Guidelines, the *cidb Standard for Indirect Targeting for Enterprise Development* and the *cidb Standard for Developing Skills on Infrastructure Contracts* are identified as part of the criteria for the Socio-Economic category.

2.4 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 is given below:

- **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 this *Green Building Policy*.

12 DPW, et al (2004). *Guidelines for the Implementation of Labour-Intensive Infrastructure Projects under the Expanded Public Works Programme*, 2nd Edition, July 2005, accessible at www.epwp.gov.za.

13 the dti (2009). *Construction Codes of Good Practice: 2000-2800 for Broad Based Black Economic Empowerment*, Issues in terms of Section 9 (1) of the BBBEE Act 53, 2003, Notice 862 of 2009, Government Gazette No. 32305, Department of Trade and Industry, accessible at www.info.gov.za.

14 cidb (2013). *cidb Standard for Indirect Targeting for Enterprise Development*. Government Gazette 36190, 25 February 2013. Construction Industry Development Board, accessible at www.cidb.org.za.

15 cidb (2013). *cidb Standard for Developing Skills on Infrastructure Contracts*. Government Gazette 36760, 23 August 2013, Construction Industry Development Board, accessible at www.cidb.org.za.

16 cidb (2013). *cidb Practice Note; Balancing Delivery, Development and Empowerment* (Draft). Construction Industry Development Board.

17 GBCSA (2013). *Socio-Economic Category Pilot, Technical Manual Green Star SA*, Green Building Council of South Africa, accessible at www.gbcsa.org.za



- **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. Central to this has been the Department's and SANEDI's role in furthering energy efficiency in buildings through its support for, amongst others:
 - SANS 10400XA: The Application of the National Building Regulations, Part X: Environmental sustainability, Part XA: Energy usage in buildings;
 - SANS 1544: Energy Performance Certificates for Buildings;
 - pending regulations on an allowance for energy efficiency savings in which building owners (amongst others) will be entitled to claim a deduction for substantiated energy efficiency savings; and
 - overseeing the Measurement and Verification (M&V) of all energy efficiency and DSM projects undertaken by registered Energy Service Companies (ESCO's);
- **National Treasury** as 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.
- **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.
- **CSIR and Academic Institutions:** These institutions have played a significant role in R&D that has supported the development of green buildings in South Africa (and internationally), and substantial expertise exists at the CSIR and at several academic institutions in energy efficiency and green buildings in general.
- **Green Building Council of South Africa (GBCSA):** The GBCSA is an independent, non-profit company that was formed in 2007 and provides *“tools, training, knowledge, connections and networks to promote green building practices across the country and to build a national movement that will change the way the world is built”*. The GBCSA is one of 92 members of the World Green Building Council, and the Green Building Councils around the world have been instrumental in the drive towards green buildings that has been witnessed around the world. In 2013, the GBCSA had representatives on its Board of Directors from (then) the Department of Environment, the Construction Industry Development Board and SALGA.
- **International support agencies,** including GIZ, Enerkey, and the Wuppertal Institute are, or have, played very strong support at (predominantly) national and local government level – through support in technology transfer, policy development and programme implementation. Such support includes, for example, the GIZ/GBCSA “Greening of Parliament” initiative.

3. BACKGROUND AND CONTEXT TO DPW GREEN BUILDING POLICY

3.1 Public Sector Leadership

Government and the public sector have a critical role in providing leadership in green buildings, and within the broader green economy. Such public sector leadership programmes typically include:

- a) **Leading by example** by establishing and implementing policies and practices for public sector institutions and their buildings – creating visibility, awareness and by sharing best practice and encouraging other sectors to follow.

UNEP-SBCI notes that that public leadership programs that are mandatory on the public sector institutions are more effective than voluntary programmes¹⁸. An example of such public leadership is that of Executive Order 13514 on Federal Leadership in Environmental, Energy, and Economic Performance signed by President Obama in October 2009 to lead by example by mandating that Federal Agencies shall¹⁹:

- increase energy efficiency;
- measure, report, and reduce their greenhouse gas emissions from direct and indirect activities;
- conserve and protect water resources through efficiency,
- reuse, and storm water management;
- eliminate waste, recycle, and prevent pollution;
- leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services;
- design, construct, maintain, and operate high performance sustainable buildings in sustainable locations;
- strengthen the vitality and livability of the communities in which Federal facilities are located; and
- inform Federal employees about and involve them in the achievement of these goals.

In support of the above Executive Order, each Federal Agency is required to:

- establish goals and targets aligned to these policies;
- establish the necessary capacity and provide the necessary resources within the public sector institutions to achieve the goals and targets;
- build networks within and across institutions to champion green buildings, to share learning, and to deliver change; and
- monitor and report on progress against these goals and targets.

- b) **Demonstration projects** to engage policy makers and implementers, both within the public and private sectors, to showcase best practice and to share learning, to demonstrate technologies and processes, and to encourage the uptake of green buildings.

Demonstration projects (and programmes) typically promote processes, technologies and behaviours that are better than current legal standards – thereby testing, developing and promoting future standards. An example of such a public demonstration project is the KFW in Germany that promotes the construction of new energy-efficient homes and the energy-

18 UNEP-SBCI (2009). *Buildings and Climate Change: Summary for Decision-Makers*. United Nations Environment Programme – Sustainable Building and Climate Initiative. Available at www.unep.org.

19 The White House (2009). *Executive Order 13514: Federal Leadership in Environmental, Energy, and Economic Performance*. Office of the Press Secretary, The White House, USA. October 2009, www.whitehouse.gov/assets/documents/2009fedleader_eo_rel.pdf.

efficient refurbishment of older residential buildings, in particular with grants or loans available from KFW at favourable conditions. KFW is promoting the Efficiency House Plus in Germany that generates more energy than it consumes²⁰. The demonstration projects align with Germany's energy efficiency strategy, as well as its sustainable transport strategy of encouraging transportation based on clean energy.

In launching the KFW Efficiency House Plus programme, the German Federal Minister Dr Peter Ramsauer noted that²¹:

"Buildings and transport together account for almost 70% of overall final energy consumption. There is an enormous potential for saving energy. In order to meet our climate change targets, we want to make optimum use of all options available. We see building and transport as a unit. It is important to take the charging infrastructure into account, in particular when constructing new buildings. With our energy plus house we will go even further. With the help of a habitable prototype, we want to demonstrate that a family can use the energy generated by the house also for their mobility. Our energy plus house generates twice as much energy as it consumes. This is enough to charge the electric vehicle outside the door. This is why we will build a model house in Berlin. Such innovative ideas can and are to make Germany a lead provider of and a lead market for electric mobility."



Efficiency House Plus in Berlin (Source: Werner Sobek)

Another example of a public sector led demonstration project is that of the US General Services Administration (GSA)²². GSA is dedicated to improving building performance and reducing energy use and environmental and health impacts of Federal buildings. In order to improve understanding of how sustainable technologies and approaches can improve building performance, GSA's Office of Federal High-Performance Green Buildings (OFHPGB) conducts demonstration research projects at

20 KFW. Housing, home modernisation and energy conservation. Bank aus Verantwortung, www.kfw.de/inlandsfoerderung/EN/Domestic-Promotion/Our-offers/Housing-home-modernisation-and-energy-conservation/index-2.html.

21 BMVBS. My House is my filling Station. Federal Ministry of Transport, Building and Urban Development, www.bmvbs.de/SharedDocs/EN/Artikel/B/energy-plus-house-my-house-my-filling-station.html.

22 GSA (2013). Living in a High-Performance Building: The Story of EPA's Region 8 Headquarters. US General Services Administration www.epa.gov/region9/waste/features/greenbuilding/.

selected Federal green buildings. GSA recently finished a multi-year demonstration research project on “The Wynkoop Building” – a LEED Gold accredited building.

The research project at The Wynkoop Building deployed scientific teams from two national Department of Energy (DOE) laboratories as well as academic and public sector organizations to assess performance in acoustics, underfloor air distribution, data center energy use, daylighting, indoor water use, thermal comfort, occupant experience, workplace functionality, and green roof applications. In all cases where the building was underperforming, the research teams made recommendations for improvements.



**Atrium of the EPA Region 8 Headquarters building,
Denver, Colorado**

Many of the planned green building activities of the Gauteng Department of Infrastructure Development can also be seen as demonstration projects to encourage the uptake of green building technologies – such as the planned roll-out of solar panels on all of Gauteng government’s state-owned buildings.

Within the South African (and within a developing countries context) it is important that demonstration projects incorporate vernacular (or traditional) architecture, as well as indigenous building materials and methods²³. The Tsoga Environmental Resource Centre of the City of Cape Town²⁴ is an example of the use of such indigenous technologies, and was awarded the Cape Institute of Architecture Award in 2006 and the Holcim Foundation for Sustainable Construction Bronze Award in 2007.

23 UNEP-SBCI (2010). Guidelines for Education Policy for Sustainable Built Environments. United Nations Environment Programme – Sustainable Building and Climate Initiative. Available at www.unep.org.

24 Holcim (2007). *Tsoga Environmental Center, Community Center in South Africa*. Holcim Foundation for Sustainable Development, accessible at http://download.holcimfoundation.org/1/docs/Tsoga_web.pdf.



Tsoga Environmental Resource Centre, Cape Town

- c) **Awareness raising, education and information campaigns** to change individual behaviours, attitudes, values, or knowledge, and to encourage the uptake of green buildings. In general, such public sector campaigns are aligned to the strategic goals and objectives of the relevant public sector institution.

Similarly, an example of a public advocacy campaign at a local government level is the Brisbane City Council’s Green Heart environmental engagement program that encourages the residents of Brisbane to make changes to our everyday lives to help Brisbane achieve its goal of becoming Australia’s most sustainable city – and making Brisbane a carbon-neutral city by 2026²⁵. The awareness raising, education and information campaigns includes the Green Heart Life sustainability e-newsletter that provides up to date with sustainability news and events.

The advocacy campaign responds to the following six Brisbane city-wide outcomes:

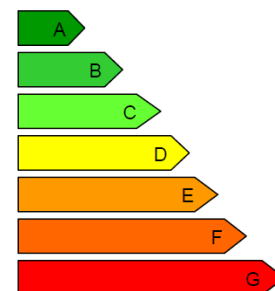
- well-designed and responsive built environment;
- green and biodiverse city;
- sustainable water use;
- towards zero waste;
- cleaner sustainable energy use; and
- green and active transport.

In terms of DPW’s *Green Building Policy*, DPW will provide leadership in the procurement and operation of green buildings.

3.2 Energy Performance Certificates (EPCs)

Energy Performance Certificates (EPCs) are used extensively around the world as a mechanism:

- to focus on energy efficiency;
- to benchmark the energy performance of buildings against national norms or industry benchmarks; and
- for establishing a register of information on energy performance of buildings, which can be used amongst others to support policy development by government and to support



²⁵ City of Brisbane. *Green Living*. accessible at www.brisbane.qld.gov.au/environment-waste/green-living/index.htm.

retrofitting programmes by building owners and operators.

While such retrofitting programmes often target the achievement of moving towards such national norms or industry benchmarks as reflected in EPCs, current international best practice however stresses the importance of avoiding any possible lock-in to inefficient retrofits with long-term consequences²⁶. Furthermore, international experience shows that in some cases it may in fact be better to delay retrofitting than to implement inadequate retrofits – as it is seldom that funds can be obtained to undertake a second retrofit of a building.

The current status of the development and implementation of EPC's in South Africa is given below:

- a) A draft Standard for Energy Performance Certificates has been developed by a working group under the direction of DPW and DoE, and submitted by DPW to SABS in October 2012. The draft EPC Standard (SANS 1544) is scheduled to be issued for public comment in October 2013.
- b) A request was submitted by DPW to SANAS in October 2012 to develop criteria for accrediting organisations for issuing EPCs. SANAS will initiate the process for the development of the necessary accreditation criteria once SANS 1544 has been issued for public comment, and expects to complete the development of the criteria within 9 to 12 months of the issuing of SANS 1544 for public comment.
- c) Draft regulation has been prepared by DoE to be issued under Section 19 of the National Energy Act, 2008 (Act No. 34 of 2008) requiring EPCs to be displayed on buildings owned, operated or occupied by organs of state with an occupancy classified in terms of Regulation A20 of the National Building Regulations as A1 (Entertainment and public assembly), A2 (theatrical and indoor sport), A3 (places of instruction), or G1 (offices). The date of enacted of the regulations will be determined in consultation between DoE and DPW, but is likely to be with effect of 1 January 2015 at the latest.
- d) It is envisaged that mandatory requirements will be introduced for private sector owners to display an EPC on selected building types on change of ownership or substantial change in tenancy developed in terms of SANS 1544 by 2018.
- e) Where an EPC is issued, such information contained in the EPC will be required to be submitted to the national Building Energy Performance Register (BEPRegister) to be established and maintained by SANEDI (or its delegated authority). SANEDI is preparing for the establishment of the BEPRegister, to which DPW and other organs of state will have access to in support of their retrofitting programmes.

In terms of DPW's *Green Building Policy*, DPW will align with the requirements for the display of EPCs on buildings occupied or operated by organs of state, and will promote the uptake of these in the private sector.

3.3 Water Performance Certificates (WPCs)

Water Performance Certificates (WPCs) are used in a few countries around the world, and most notably in Australia, as a mechanism:

- to focus on water efficiency;
- to benchmark the water usage performance of a building against industry benchmarks or national norms; and

²⁶ UNEP (2011). *Towards a Green Economy; Buildings: Investing in Energy and Resource Efficiency*. United Nations Environment Programme, accessible at www.unep.org/greeneconomy/.

- for establishing a register of information on water-usage of buildings, which can be used amongst others to support policy development by government and to support retrofitting programmes by building owners and operators.

At present Water Performance Certificates (WPCs) are not available in South Africa, but the Green Building Council of South Africa (GBCSA) has introduced a Water and Energy Benchmarking Tool which provides a comparison of a buildings water usage to measured benchmarks. The Water and Energy Benchmarking Tool is however presently only available for office type buildings²⁷.

The current status of the development and implementation of WPC's in South Africa is given below:

- a) SANS 10400W, the application of the National Building Regulations (NBRs); Water Services, is currently under development by the SABS, and will be mandatory minimum standard for the design of water services of all new buildings within the scope of the NBRs. SANS 10400W however does not include water benchmarks per building class, but (amongst others) minimum flow rates from terminal water fittings.
- b) Subject to acknowledgement of the data source, GBCSA has agreed to provide its water benchmarks for office buildings available to DPW to support the establishment of a South African National Standard for WPCs.

In terms of DPW's *Green Building Policy*, DPW will facilitate the development and introduction of requirements for the display of WPCs on buildings occupied or operated by organs of state, and will promote the uptake of these in the private sector.

3.4 Eco-Labeling of Building Products and Materials

Ecolabels and Green Stickers are labelling systems for food and consumer products – and are increasingly being used for building products and materials. While the use of eco-labels are often voluntary, they are increasingly being incorporated into green procurement policies, design specifications and Green Building Rating Tools.

Some eco-labels quantify pollution or energy consumption by way of index scores or units of measurement, while other eco-labels simply assert compliance with a set of practices or minimum requirements for sustainability or reduction of harm to the environment.

A Memorandum of Agreement was to be concluded in 2010 between DPW and the Department of the Environment for:

- establishing a framework for an eco-labelling system for building materials and products in South Africa; and
- establishing eco-labelling criteria for a prioritised list of building materials and products (a list of eight materials and products has been identified).

This process has however stalled, and in terms of DPW's *Green Building Policy*, DPW will:

- initiate the development of an eco-labelling scheme for building products and materials independent of DEA; or
- recommend the adoption of an existing local or international eco-labelling scheme for building products and materials.

²⁷ GBCSA. *Energy and Water Benchmark*. Green Building Council of South Africa, accessible at www.gbcsa.org.za/other-tools/energy-water-benchmark/.

3.5 Energy, Water and Waste Management Plans (EWWMPs)

Energy, Water and Waste Management Plans (EWWMPs) document how an organisation will plan, implement, and assess the effectiveness of its objectives managing energy, water and waste within a building, and typically:

- specify responsibilities for managing energy, water and waste within the facility;
- establish goals and objectives;
- measure or estimate the energy, water and waste use or generation;
- set targets for reducing energy, water and waste, and for recycling water and waste;
- identify strategies and implement measures for reducing energy, water and waste, and for recycling water and waste;
- identify and communicate communication and training to support;
- monitor progress towards achieving targets;
- on-going monitoring and review.

Requirements for facilities managers to develop and implement EWWMPs are common requirements to enhance the management.

Various local and international management plans exist which can be used as input for the development of guidelines for EWWMPs by DPW.

In terms of DPW's *Green Building Policy*, DPW will develop and implement management plans to reduce energy, water and waste within its portfolio of buildings, as well as recycling of waste and increasing the purchase of recycled materials.

3.6 National Building Regulations; Environmental Sustainability (SANS 10400X)

Green Building Codes of Practice, or Standards, are emerging in many countries, and in particular in the USA. These Green Building Codes include the International Green Construction Code (IgCC)[™] developed by the International Code Council (ICC) in association with cooperating sponsors ASTM International (ASTM) and the American Institute of Architects (AIA). The IgCC provides minimum requirements together with project electives to encourage and drive the construction of buildings that exceed the minimum requirements of the code (much like rating systems do). However, to date, there has been very little uptake of the IgCC.

A further example of Green Building Codes is the 2010 California Green Building Standards Code (CALGreen) which has incorporated similar green building standards in its building code effective 2011. Like IgCC, CALGreen includes prescriptive mandatory and elective measures designed to improve building energy efficiency as well as reduce water usage and improve the working environment.

In line with this trend of Green Building Codes, SANS 10400X, the application of the National Building Regulations (NBRs); Environmental Sustainability, is currently being expanded to include:

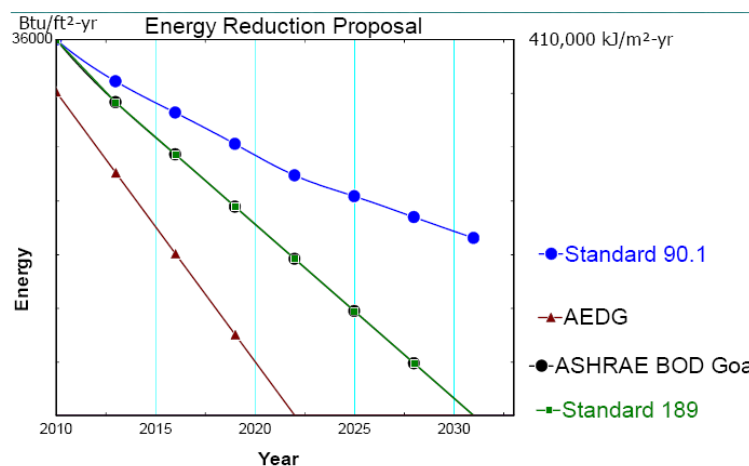
- planning and design;
- energy usage in buildings (Part XA) (see also Section 3.2);
- water usage in buildings (Part XW) (see also Section 3.3);
- indoor environmental quality and comfort; and
- material resource conservation and efficiency.

Furthermore, many countries have established and implemented clear trajectories for energy efficiencies and other sustainability issues, including:

- The European Commission, who on 19 May 2010 adopted the Energy Performance of Buildings Directive 2010/31/EU (EPBD) which is the main legislative instrument to reduce the

energy consumption of buildings²⁸. Under this Directive, Member States must establish and apply minimum energy performance requirements for new and existing buildings, ensure the certification of building energy performance and require the regular inspection of boilers and air conditioning systems in buildings. Moreover, the Directive requires Member States to ensure that by 2021 all new buildings are so-called 'nearly zero-energy buildings'.

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), which has developed a strategy incrementally enhancing for ASHRAE A90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings and ASHRAE 189 Standard for the Design of High-Performance, Green Buildings²⁹ (see below). The US Energy Department has introduced requirements requiring new federal buildings to meet the higher energy efficiency standards of ASHRAE A90.1 for all buildings for which design began on or after July 9, 2014³⁰.



Energy Reduction Proposals: ASHRAE 90.1 and 189
(After ASHRAE 2008)

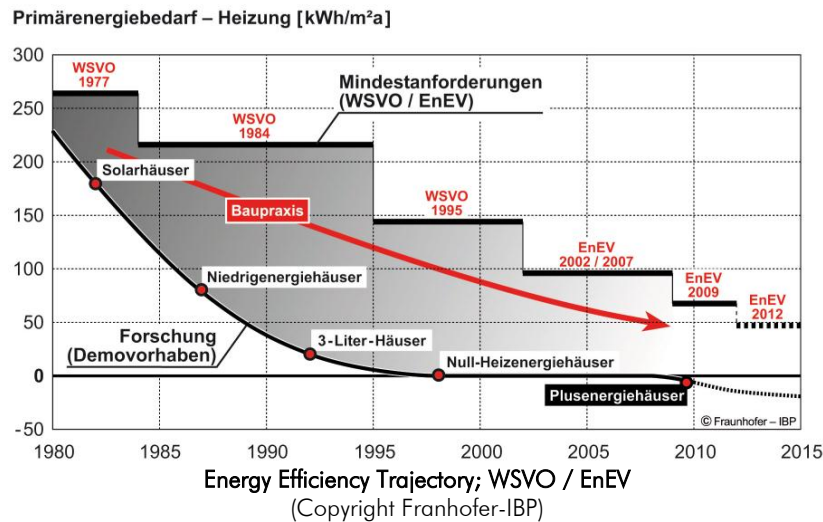
- The German Energy Conservation Regulation (EnEV), which prescribes requirements to the primary energy demand of new residential and non-residential buildings³¹. As illustrated below, the Energy Conservation Regulations have been incrementally enhanced to achieve improved energy efficiency.

28 European Commission (2010). Directive 2010/31/EU of 19 May 2010 on the Energy Performance of Buildings. European Commission, accessible at ec.europa.eu/energy/efficiency/buildings/buildings_en.htm.

29 ASHRAE (2008). *ASHRAE Vision 2020: Providing tools by 2020 that enable the building community to produce market-viable NZEBs by 2030*. A Report from American Society of Heating, Refrigerating and Air-Conditioning Engineers, January 2008, accessible at www.ashrae.org.

30 DOE (2013). *Energy Efficiency Design Standards for New Federal Commercial and Multi-Family High-Rise Residential Buildings*. US Department of Energy, July 2015, accessible at www.federalregister.gov/articles/2013/07/09/2013-16297/energy-efficiency-design-standards-for-new-federal-commercial-and-multi-family-high-rise-residential.

31 BBSR. *Energy Saving Ordinance (EnEV)*. Federal Institute for Research on Building, Urban Affairs and Spatial Development accessible at www.bbsr-energieeinsparung.de/EnEVPortal/EN/Home/homepage__node.html.



However, to-date, South Africa does not have time bound trajectories for enhancing SANS 10400XA for energy efficiency in buildings – which is urgently needed. Together with the Department of Energy, DPW will therefore facilitate that SABS Steering Committee 59G Construction Standards – Energy Efficiency and Energy Use in the Built Environment will develop a clear plan to incrementally ramp-up energy efficiency in SANS 10400XA / 0204.

3.7 Green Building Rating Tools

Green building rating tools are used extensively around the world as a mechanism to drive the adoption and uptake of green buildings – such as those developed or operated by Green Building Councils in the USA, UK, Australian and South African. Such green building rating tools offer certification against various levels of best practice standards, and are distinctly different from the minimum standards adopted in green building or sustainability codes such as the IgCC and SANS 10400XA (see Section 4.6).

Various countries around the world, and in particular in the USA, have mandated that public sector buildings should be designed to achieve various levels of green building rating. Specifically, notwithstanding that while the CALGreen Building Code (see Section 4.6) is mandatory for all new buildings constructed after 1 January 2011, California has still maintained Executive Order S-20-04 (EO) which requires designing, constructing and operating all new and renovated state-owned facilities paid for with state funds to obtain ‘LEED Silver’ green building or higher certified rating. Furthermore, many municipalities in California require municipal buildings to be LEED Silver accredited.

Green Building certification has been identified as a best practice in several government documents in South Africa, including the *Gauteng Integrated Energy Strategy*³² and the draft *National Energy Efficiency Strategy*³³.

Internationally, it has also been shown that regulatory instruments and control instruments, such as building codes and appliance standards, are both most effective and normally also most cost-effective. Evidence suggests that green building rating tools will also fall within this category of instruments.

32 DLGH (2010) *Gauteng Integrated Energy Strategy*. Department of Local Government and Housing, January 2010, accessible at [www.dlgh.gpg.gov.za/Documents/Energy%20Strategy/GIESPart1Part5FinalWeb25Mar10\[1\].pdf](http://www.dlgh.gpg.gov.za/Documents/Energy%20Strategy/GIESPart1Part5FinalWeb25Mar10[1].pdf).

33 DoE (2012). *Draft Second National Energy Efficiency Strategy Review*. Gazette Notice 1000 of 2012, Gazette 35920. Department of Energy, November 2012.

Against this background, the cidb identified “The Green Star South Africa: Office Version 1” as a best practice to be followed in the design of office buildings in the government gazette of 1 April 2011. Furthermore, in response to the needs of the public sector, the cidb also sponsored the development of “The Public and Educational Building” rating tool, which has recently been released by GBCSA.

With the endorsement of DPW, the cidb will introduce mandatory requirements through its *Best Practice Project Assessment Scheme* for organs of state to specify that selected new buildings (including PPPs) for which the planning phase is begun (including major renovations for which planning approval is required) shall be designed and/or constructed to achieve, at a minimum, 4 Star Green Star SA certification, where such Green Star SA rating system exists.

Furthermore, it should be noted that the GBCSA has also released its Existing Building Performance Tool for pilot application. The Existing Building Performance Tool focuses on “*measurable performance indicators such as energy and water, management policies and plans required to achieve environmental performance, and lease agreements with building tenants*”.

3.8 Green Procurement and Green Leases

Green Public Procurement (GPP) is defined as “a process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment³⁴.” Key elements of a GPP policy include:

- establish a GPP framework and policy;
- establish a governance framework;
- conduct initial training;
- undertake a status assessment, legal review, prioritisation exercise and readiness analysis;
- undertake strategic planning, create a GPP policy and action plan; and
- implement the GPP policy throughout the procurement cycle.

In line with the above, the various steps to implementing a GPP policy include:

- applying sustainability criteria along the contracting cycle;
- identifying needs and improving efficiency;
- defining the specification and inviting bids;
- using Eco-labels;
- evaluating and selecting suppliers;
- evaluating bids and awarding contracts;
- auditing and improving supplier performance; and
- managing contracts for GPP.

3.9 Monitoring

There is increasing recognition that government regulators and organizations need to track and manage their building stock, and to enhance the sustainability of this stock. Monitoring and reporting on sustainable buildings is a necessary requirement to both demonstrate leadership in the building sector and to prepare for future policies and regulations.

34 European Union (2001). *Buying Green! A Handbook on Green Public Procurement 2nd Edition*. Publications Office of the European Union, 2011, Luxembourg, ISBN: 978-92-79-19930-1, accessible at europa.eu.

DRAFT 3

Various reporting protocols exist – but primarily for GHG emissions. Once such reporting protocol for GHG emissions from public buildings is “*The GHG Protocol for the U.S. Public Sector*”, but this does not address broader sustainability issues, etc.

The pilot UNEP-SBCI SB Protocol does however provide such a framework for monitoring and reporting on the influence of the performance of the building stock on core sustainability issues.

Note that reference has been made in Section 3.2 with regard to the establishment of the national Building Energy Performance Register (BEPRegister) to be established and maintained by SANEDI (or its delegated authority) – which will be an important input into any monitoring system.

In terms of DPW's *Green Building Policy*, DPW will develop reporting on the influence of the performance of its building stock on core sustainability issues.

4. DPW GREEN BUILDING POLICY

DPW will provide leadership in the procurement and operation of green buildings within South Africa, within organs of state in general, and specifically within DPW, through the implementation of DPW's *Green Building Policy* as given below. A model *Green Building Policy* which can be adopted by other organs of state and which is aligned to DPW's *Green Building Policy* is given in Annexure 1.

i) **Leadership:** DPW will champion the adoption of the Green Buildings within the public sector, and will establish a green building network amongst key public sector institutions to:

- facilitate and encourage the uptake of Green Building policies and practices within other organs of state as appropriate; and
- establish and implement, or support, relevant green building demonstration projects, together with awareness raising, education and information campaigns aligned to selected key strategic objectives – including campaigns targeting occupants of public sector buildings to reduce energy, water and waste.

Specifically:

- DPW will facilitate the development of an implementation plan, including co-funding, of a minimum of three public sector green building demonstration projects by mid-2014. The green building demonstration projects will involve and support the development of capacity at institutions such as the CSIR and/or selected Universities – with a particular emphasis on supporting transformation of R&D capacity at these institutions. Specific attention will also be given to incorporating aspects of vernacular architecture into green building design in South Africa.
- DPW will facilitate the development and implementation of a cross-cutting awareness raising, education and information campaign by mid-2014.

ii) **Energy Performance Certificates (EPCs):** DPW will align with the mandatory requirements to be introduced in terms of the Energy Act to display an EPC in a prominent place that is clearly visible to the public on selected building types which are owned, operated or occupied by DPW.

DPW will develop and implement guidelines and minimum standards by mid-2014 for leasing of buildings by organs of state in line with the measured energy performance as recorded in EPCs. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

DPW will develop and implement guidelines and minimum standards by mid-2014 for prioritising and for retrofitting of buildings owned by organs of state in line with the measured energy performance as recorded in EPCs. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

iii) **Water Performance Certificates (WPCs):** DPW will provide leadership and will by end-2014 facilitate that a relevant authority champions the development and implementation of WPCs, and will align with any mandatory requirements to be introduced to display a WPC in a prominent place that is clearly visible to the public on selected building types which are owned, operated or occupied by DPW.

DPW will by end-2014 develop and implement guidelines and minimum standards for leasing of buildings by organs of state in line with the measured energy performance as

recorded in WPCs. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

DPW will by end-2014 develop and implement guidelines and minimum standards for prioritising and for retrofitting of buildings owned by organs of state in line with the measured water performance as recorded in WPCs. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

- iv) **Eco-labelling of building materials and products:** DPW will by mid-2014 facilitate the establishment of an eco-labelling system for building materials and products, and will facilitate that requirements for the use of environmentally sensitive eco-labelled materials and products will be incorporated into SANS 10400X (and in particular into indoor environmental quality and comfort, and material resource conservation and efficiency).

DPW will by end-2014 develop and implement guidelines and minimum standards for using environmentally sensitive eco-labelled materials, which will be incorporated into DPW's Specifications for Construction Works. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

- v) **Energy, Water and Waste Management Plans (EWWMPs):** DPW will by mid-2014 develop and implement guidelines and minimum standards for Energy, Water and Waste Management Plans to reduce energy, water and waste in such buildings, as well as recycling of waste and increasing the purchase of recycled materials. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

- vi) **National Building Regulations; Environmental Sustainability (SANS 10400X):** DPW by end-2014 will develop and implement guidelines for prioritising and for retrofitting of buildings which pre-date the implementation of 10400X to comply with the operational requirements of indoor environmental quality and comfort of SANS 10400X. DPW will promote the adoption of these guidelines by other organs of state.

DPW will by end-2014 develop and implement guidelines and minimum standards for leasing of buildings by DPW in line with the selected requirements of SANS 10400X, including indoor environmental quality and comfort. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

DPW will by mid-2014 develop and communicate a clear medium-term vision for energy efficiency within public buildings, and will facilitate a clear plan to incrementally ramp-up energy efficiency in SANS 10400XA / 0204.

- vii) **Green Building Rating:** DPW will align with the cidb requirements for organs of state to specify that selected new buildings (including PPPs) for which the planning phase is begun (including major renovations for which planning approval is required) shall be designed and/or constructed to achieve, at a minimum, 4 Star Green Star SA certification, where such Green Star SA rating tool exists. Where relevant, including for demonstrating public sector leadership, DPW shall specify higher certification requirements.

DPW will implement requirements for leasing of buildings that were constructed in 2010 or after, to be certified at a minimum, to a 4 Star Green Star SA design or construction certification, where such Green Star SA rating tool exists. DPW will promote such requirements to other organs of state.

- viii) **Green Procurement and Green Leases:** DPW will by end-2014 develop and implement guidelines and minimum standards for a Green Building Public Procurement Policy for



organs of state that procure, occupy or operate buildings. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

- ix) **Monitoring:** DPW will by end-2014 develop and implement guidelines and minimum standards for compiling Sustainable Building Reports for organs of state that own or occupy a portfolio of buildings of 10 000m² and greater. DPW will promote the adoption of these guidelines and minimum standards by other organs of state.

Through the implementation of this *Green Building Policy*, DPW will support:

- *sustainable development* within South Africa;
- *job creation* and the development of green jobs;
- the development of *improved working and living conditions*; and
- the development of *cost effective solutions and the efficient use of resources* during the life of buildings.

ANNEXURE 1. MODEL GREEN BUILDING POLICY

A model *Green Building Policy* for adoption by organs of state is given below.

- i) **Leadership:** [The organ of state] will participate in the network of public sector institutions to be facilitated by the Department of Public Works to:
- facilitate and encourage the uptake of green buildings within other organs of state as appropriate; and
 - establish and implement, or support, relevant green building demonstration projects, together with awareness raising, education and information campaigns aligned to selected key strategic objectives – including campaigns targeting occupants of public sector buildings to reduce energy, water and waste.

- ii) **Energy Performance Certificates (EPCs):** [The organ of state] will align with the mandatory requirements to be introduced in terms of the Energy Act to display an EPC in a prominent place that is clearly visible to the public on selected building types which are owned, operated or occupied by [the organ of state].

[The organ of state] will adopt and implement the DPW guidelines and minimum standards for leasing of buildings by organs of state in line with the measured energy performance as recorded in EPCs.

[The organ of state] will adopt and implement the DPW guidelines and minimum standards for prioritising and for retrofitting of buildings in line with the measured energy performance as recorded in EPCs.

- iii) **Water Performance Certificates (WPCs):** [The organ of state] will align with any mandatory requirements to be introduced to display a WPC in a prominent place that is clearly visible to the public on selected building types which are owned, operated or occupied by [the organ of state].

[The organ of state] will adopt and implement the DPW guidelines and minimum standards for leasing of buildings in line with the measured energy performance as recorded in WPCs.

[The organ of state] will adopt and implement the DPW guidelines and minimum standards for prioritising and for retrofitting of buildings in line with the measured water performance as recorded in WPCs.

- iv) **Eco-labelling of building materials and products:** [The organ of state] will adopt and implement the DPW guidelines and minimum standards for using environmentally sensitive eco-labelled materials, which will be incorporated into [the organ of state's] Specifications for Construction Works.

- v) **Energy, Water and Waste Management Plans (EWWMPs):** [The organ of state] will adopt and implement the DPW guidelines and minimum standards for buildings that [the organ of state] owns or operates for Energy, Water and Waste Management Plans to reduce energy, water and waste in such buildings, as well as recycling of waste and increasing the purchase of recycled materials.

- vi) **National Building Regulations; Environmental Sustainability (SANS 10400X):** [The organ of state] will adopt and implement the DPW guidelines and minimum standards for leasing of



buildings in line with the selected requirements of SANS 10400X, including indoor environmental quality and comfort.

- vii) **Green Building Rating:** [The organ of state] will align with the cidb requirements for organs of state to specify that selected new buildings (including PPPs) for which the planning phase is begun (including major renovations for which planning approval is required) shall be designed and/or constructed to achieve, at a minimum, 4 Star Green Star SA certification, where such Green Star SA rating tool exists. Where relevant, including for demonstrating public sector leadership, [the organ of state] shall specify higher certification requirements.

[The organ of state] will implement requirements for leasing of buildings that were constructed in 2010 or after, to be certified at a minimum, to a 4 Star Green Star SA design or construction certification, where such Green Star SA rating tool exists.

- viii) **Green Procurement and Green Leases:** [The organ of state] will adopt and implement the DPW guidelines and minimum standards for a Green Building Public Procurement Policy for organs of state that procure, occupy or operate buildings.

- ix) **Monitoring:** [The organ of state] will adopt and implement the DPW guidelines and minimum standards for compiling Sustainable Building Reports for organs of state that own or occupy a portfolio of buildings of 10 000m² and greater.