# THE ROLE OF BUILDING REGULATIONS IN SUSTAINABLE LOCAL GOVERNANCE

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by

**Marjoné van der Bank**

LLB

Student number: 20457464

**Study supervisor:** Prof Anél du Plessis

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Marjoné van der Bank

**Index**

**List of abbreviations**

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| Agenda 21 | Agenda 21 of the United Nations Conference on Environment and Development, 1992 |
| Brundtland Report | The Report of the Brundtland Commission, Our Common Future, 1987 |
| CDM | Clean Development Mechanism |
| Constitution | Constitution of the Republic of South Africa, 1996 |
| EIA | Environmental Impact Assessment |
| GBCSA | Green Building Council of South Africa |
| GHG | Greenhouse gas |
| IDP | Integrated Development Plan |
| NEMA | National Environmental Management Act 107 of 1998 |
| NRBS | National Building Regulations and Building Standards Act 103 of 1977 |
| RICS | Royal Institution of Chartered Surveyors |
| SABS | South African Bureau of Standards |
| SAJELP | South African Journal of Environmental Law and Policy |
| SANS | South African National Standards |
| SEA | Strategic Environmental Assessment |
| Structures Act | Local Government: Municipal Structures Act 117 of 1998 |
| Systems Act | Local Government: Municipal Systems Act 32 of 2000 |
| WCED | World Commission on Environment and Development: Our Common Future, 1987 |
| WSSD | World Summit on Sustainable Development |

**Summary**

This study highlights one way by means of which South Africa can become more sustainable namely by applying "green building" and "green design" in the local context. The study asks the question: What is the role of building regulations in sustainable local governance as provided for in South African environmental and local government legislation?

Schedule 4(B) in conjunction with section 156(1) of the *Constitution of the Republic of South Africa,* 1996 (hereafter the Constitution) states that local government has the power to execute law-making and executive powers in relation to building regulations. The Constitution further provides in section 24, the environmental right, read together with section 152(1) that municipalities are co-responsible with the other two spheres of government to protect the environment and to secure an environment that is not detrimental to the health or well-being of people. The *Local Government: Municipal Systems Act* 32 of 2000 in section 4(2)(d), (i) and (j) further states that municipalities have the duty to provide services that is effective, fair and sustainable.

Municipalities are bound by national legislation (including the *National Environmental Management Act* 107 of 1998 and national legislation dealing with building regulations, specifically the *National Building Regulations and Building Standards Act* 103 of 1977) in how it deals with and within the environment. The South African National Standards (SANS) 10400-XA: 2011 finds its application specifically on environmental sustainability and energy usage in buildings. The link between these laws and instruments (such as SANS and other projects) and the notion of "green building" is explored in this dissertation.

Municipalities in the Western Cape Province are making an effort to adhere to the above national laws. More specifically the City of Cape Town has a *Problem Building By-law* and the Drakenstein Municipality (Paarl) has a green building manual to regulate "green building" and "green design". With reference to these two municipalities, this study serves to show that some South African municipalities

strive toward "green building" and "green design", but more have to be done nationally in order to be pro-active in this regard.

**Opsomming**

Die studie toon een manier hoe Suid-Afrika meer volhoubaar kan word naamlik, deur die aanwending van "groen geboue" en "groen ontwerp" in die plaaslike sfeer. Die studie stel as navorsingsvraag: Wat die rol is van bouregulasies in 'n volhoubare plaaslike bestuur, soos in die Suid-Afrikaanse plaaslike en omgewings wetgewing?

Bylae 4 (B) moet saam met artikel 156 (1) van die *Grondwet van die Republiek van Suid-Afrika*, 1996 (hierna die Grondwet) gelees word wat bepaal dat die plaaslike regering die bevoegdheid het om wetgewing te maak en uitvoerende bevoegdhede wat betrekking het op bouregulasies, uit te voer. Die Grondwet bepaal verder in artikel 24 wat betrekking het op die omgewing, en artikel 152 (1) dat munisipaliteite mede-verantwoordelik is saam met die ander twee sfere van die regering om die omgewing te beskerm en te verseker dat die omgewing nie nadelig is vir die gesondheid of welsyn van mense nie. Die *Wet op Plaaslike Regering: Munisipale Stelsels Wet* 32 van 2000 in artikel 4 (2)(d), (i) en (j) en verklaar verder dat munisipaliteite die plig het om dienste te voorsien wat doeltreffend, billik en volhoubaar is.

Munisipaliteite is onderhewig aan nasionale wetgewing wat handel met die omgewing, insluitend die *Wet op Nasionale Omgewingsbestuur* 107 van 1998 en nasionale wetgewing wat handel met bouregulasies, naamlik die *Wet op Nasionale Bouregulasies en Boustandaarde Wet* 103 van 1977. Die Suid-Afrikaanse Nasionale Standaarde (SANS) 10400-XA: 2011 is spesifiek van toepassing op die volhoubaarheid van die omgewing en die aanwending van energie in geboue. Die skakel tussen die wetgewing en instrumente (soos byvoorbeeld SANS and ander projekte) en die idee van "groen bou" is ondersoek in hierdie navorsingsverslag.

Munisipaliteite in die Wes-Kaap, veral Kaapstad het 'n *Probleem Gebou Verordening* en die Drakenstein Munisipaliteit (Paarl) het 'n *Groen Gebou Handleiding* wat "groen geboue" en "groen ontwerp" reguleer en bevorder. Hierdie studie toon aan dat sommige munisipaliteite in Suid-Afrika streef na "groen bou" en "groen ontwerp", maar daar behoort meer op nasionale vlak gedoen word ten einde pro-aktief te wees in hierdie verband.

# 1 Introduction

The World Summit on Sustainable Development (WSSD) took place in Johannesburg in 2002, when world leaders agreed to change consumption and production patterns and to develop a sustainability framework. The subsequent WSSD framework contains a programme setting out an environmentally friendly manner in which sustainable production and consumption should take place to promote social and economic development.[1] Concerns about climate change, energy consumption patterns and the increasing incidence of threats to the natural resource base have since continued to grow internationally, as is the desire to address these concerns. A number of international and national instruments were therefore developed to address such issues, including the WSSD, the United Nations Framework Convention on Climate Change[2] and the National Climate Change Response White Paper, 2011.[3] All of these instruments convey one central message: the time has arrived to reassess the way in which human beings interact with and use natural resources such as water, air, soil and biodiversity.[4]

The South African government does not stand oblivious to these international developments. A very prominent role in protecting the environment[5] is for example carved out for local government. There is significant focus in South Africa on the notion of "developmental local government"[6] since 1996. Section 4(2)(d), (i) and (j) of the *Local Government: Municipal Systems Act* 32 of 2000[7] (hereafter the Systems Act) states that municipalities are to strive to ensure that municipal services are provided in a financially and environmentally sustainable manner. The notion of

1 Kidd *Environmental Law* 13.
2 Kidd *Environmental Law* 13.
3 See paragraph 4.3.4.5.
4 GN 757 in GG 34695 of 19 October 2011 (National climate change Response White Paper, 2011).
5 Section 1 of the *National Environmental Management Act* 107 of 1998. For purposes of this study "environment" means the surroundings which humans exist and that are made up of (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
6 See par 4.3.4.1.
7 Section 4(2)(d),(i) and (j) of the Systems Act.

sustainable services must in this context be interpreted to involve the integration of social, economic and environmental factors in local decision-making, for example.[8]

The South African government comprises of national, provincial and local spheres. Each of these three spheres has its own constitutional powers, duties and responsibilities that must be exercised in accordance with the Constitution.[9] The areas of competence of municipalities are listed in Schedules 4(B) and 5(B) of the Constitution. The Constitution further provides in sections 24[10] and 152(1)[11] that local government is co-responsible with other government spheres (which are distinctive, interdependent and interrelated)[12] for fulfilling the duties of local government as entrenched in *inter alia* section 156 of the Constitution.[13] A common constitutional objective and duty of the three spheres is environmental protection and the securing of an environment that is not detrimental to the health or well-being of people, both the present and the future generations.[14] This objective and duty is most prominently entrenched in section 24, the environmental right.

It is important to recognise that section 7(2) of the Constitution[15] must be read in conjunction with section 24 of the Constitution. Section 24 must accordingly be respected, protected and promoted to fulfil the environmental right of all people in South Africa.[16] Section 8 of the Constitution stipulates that the Bill of Rights, which includes section 24, applies to the legislature, the executive, the judiciary and all organs of state.[17] Therefore there is an obligation on the State (including municipalities) as well as natural and juristic persons to protect the environment in such a way that the state of the environment is not detrimental to the health or the well-being of present and future generations.[18]This duty is taken further in South

8 Section 4(2)(d),(i) and (j) of the Systems Act.
9 Bekink*Principles of South African Local Government Law* 1.
10 Section 24 of the Constitution See paragraph 4.3.1 for discussion.
11 Section 152(1) of the Constitution. See paragraph 4.3.1 for discussion.
12 Section 40(1) of the Constitution.
13 Section 40(1) of the Constitution.
14 Section 24 (1)(b) of the Constitution.
15 Section 7(2) of the Constitution states that the state must respect, protect, promote and fulfil the rights in the Bill of Rights.
16 Section 7(2) of the Constitution.
17 Section 8(1) of the Constitution.
18 Brand and Heyns*Socio-Economic Rights in South Africa* 258.

African environmental law where provision is *inter alia* made for municipalities to actively pursue environmentally sustainable management.[19]

One way in which municipalities could contribute to sustainable development is; the execution of their developmental mandate and the realisation of their duties in terms of the Constitution, the Systems Act and the NEMA is through investment in "green design" and "green building". The notions of "green design" and "green building" increasingly receive international and domestic attention.[20] Since local authorities are responsible in terms of the Constitution and South African law for the regulation of planning and erection of new buildings and facilities across South Africa it appears as if municipalities may have a particular important role to play.

In addition to various environmental and local government laws, municipalities in South Africa are bound by national legislation that regulates building, specifically the *National Building Regulations and Building Standards Act* 103 of 1977 (hereafter NRBS). The Department of Trade and Industry further announced in 2011[21] that country-wide regulations for the sustainable development of buildings in South Africa are put in place. These include regulations towards the construction of more energy-efficient buildings.[22] These national developments inevitably will have an impact on local government as the primary duty-holder in relation to building regulations. SANS 10400-XA: 2011(promotion of efficient energy usage in buildings) is relatively unknown, since the document was only published in August 2011 and the regulation[23] first came into effect in November 2011, has not yet been fully implemented and tested in the local government environment. Building regulations are a functional area of competence listed in Schedule 4(B) of the Constitution.[24] Some municipalities have already shown to be doing significant work with respect to greening construction such as housing.[25]

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19 Section 2 of NEMA. Also see paragraph 2.
20 See paragraph 2.1.
21 GG R 711 no 34586 of 9 September 2011.
22 Kidd *Environmental Law* 2nded322.
23 GG R711 no 34586 of 9 September 2011.
24 Schedule 4(B) of the Constitution.
25 As will be shown in paragraph 5 below, some municipalities in the Western Cape Province have already started employing their local powers to encourage "green design" and "green building" at the local level.

Given the expected development in this environmentally-friendly approach to building in South Africa from a sustainable development perspective, this study asks: What is the role of building regulations in sustainable local governance as provided for in South African environmental and local government legislation?

In order to address this question, the study will consist of a literature review of relevant legislation, government publications, textbooks, case law and international instruments. Primary and secondary source material relating to environmentally friendly or "green" construction will be subjected to critical analysis which will give rise to recommendations and a conclusion. An initial review of "green design" or "green building" in achieving the object of sustainability is conducted in paragraph 2. Subsequently, South Africa's building regulations are analysed in paragraph 3. The nature of the relevant environmental laws and local government is considered in paragraph 4. Paragraph 5 provides a brief review of the *status quo* of the building regulations currently in place in two municipalities in the Western Cape Province, namely Cape Town (as a metropolitan, Category A municipality) and Drakenstein Municipality (Paarl) (as a medium-size, Category B municipality).[26] Finally, the study concludes with what the role of building regulations is in sustainable local governance and findings and recommendations of the role that local government can play in South Africa's response to "green building" or "green design" generally.

## 2 "Green design" and"green building": meaning and relevance for sustainable development

### *2.1 Introduction: the contextual relevance of sustainable development*

Growing emphasis, both in South Africa and internationally, is placed on efficient energy utilisation and so-called "green design" or "green building" to achieve ends leading to sustainability.[27]A green building has been defined *inter alia* as "a building

26 It must be noted that these municipalities are not representative of all municipalities in the entire country and have been selected on the bases of information that is readily available for purposes of a desktop review.

27 Organisation for Economic Co-operation and development 2003 http://www.buildgreen.co.nz/definition.html.United States Green Building Council 2006 http://www.ctenergyinfo.com/greenbuildings. The United States Green Building Council states that when a 'green building' is planned, the planning of the site on which the

that is environmentally sustainable, in which its design is constructed and operated to minimise the environmental impact."[28] Such building practices for example include designing controlled ventilation, using recycled material, and installing solar power equipment.[29] The design of green buildings is not limited to the architectural and design sciences, but also affects public administration and decision-making, if one considers its relationship with the approval processes demanded by building regulations, for instance.[30]

It is more important however, that "green design" or "green buildings" should be perceived as mechanisms to contribute to sustainable development. Before delving deeper into the notion of "green buildings", attention is briefly paid to the notion of sustainable development and its ancillary objectives.

### *2.1.1 What is sustainable development?*

In order to understand how "green building" could contribute to sustainable development, generally, it is important to understand what sustainable development means. The principle of sustainable development was first coined in the *Report of the World Commission on Environment and Development: Our Common future* (WCED), widely known as the *Brundtland Report*.[31]"Sustainable development" is defined in the *Brundtland Report*as:

> Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Another definition that can be given to sustainable development is to perform activities that safely can be performed indefinitely.[32] This supposes that the activities will be performed in the environment, and that it will be possible to continue to

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building must be conducted must ensure sustainability and must also safeguard water and water conservation through the whole building life cycle.

28 Organisation for Economic Co-operation and Development 2003 http://www.buildgreen.co.nz/definition.html.

29 Kidd *Environmental Law* 322.

30 Reynolds 2008 http://www.active.cput.ac.za/energy/web/due/papers/2007/09L_Reynolds.

31 WCED *Our Common Future* 1987.

32 Fitzmaurice, Ong and Merkouris*Research Handbook on International Environmental Law* 18.

perform these activities in the environment indefinitely. Sustainable development should in other words be understood in two contexts, the first having to do with people`s needs and the second dealing with the technology and social organisation which will ensure the environment`s ability to meet the needs of present and future generations.[33]The findings of the *Brundtland Report* include the recommendation that the environment should be re-examined in the context of developmental issues.[34]

In the broader context the *BrundtlandReport* suggests that the impact of development on the natural environment should be established and that a limit should be put on further development in order to ensure that the environment is able to sustain the survival of future generations. The Millennium Ecosystem Assessment claimed that human activity is putting a strain on the environment and the natural ecosystem and that such sustainability can therefore no longer be taken for granted.[35] Human economic, social and environmental systems are inextricably linked, and their development should be controlled and monitored simultaneously.[36] These systems are referred to as the three pillars of sustainable development.[37]

What is happening in the building sector cannot be separated from sustainable development. In fact, it has been argued that there is a direct link between what is envisaged with sustainable development and the impacts posed by development in the built environment. In 2003 the Organisation for Economic Co-operation and Development stated that:

> The building sector has major impacts not only on economic and social life, but also on the natural and built environment. Various building activities, such as the design, construction, use, refurbishment and demolition of buildings, directly and indirectly affect the environmental performance of the sector.[38]

33 Bouillon "*VolhoubareGrondontwikkeling*" 63.
34 WCED *Our Common Future* 1987.
35 Richardson and Wood *Environmental Law for Sustainability* 2.
36 Kidd *Environmental Law* 16.
37 Kidd *Environmental Law* 16.
38 Organisation for Economic Co-operation and Development 2003 http://www.buildgreen.co.nz.

Against the background of the *Brundtland Report's* definition and Agenda 21's[39] objectives of sustainability, one must deal with the fact that the building sector has an impact on the environment and therefore also on sustainable development, as more people move to the world's cities and there is increased strain on the existing infrastructure and the built environment has to expand. According to the UN-Habitat, urbanisation is unstoppable, irreversible and is taking place in the developing world, therefore cities in the developing world is holding the key to sustainable development.[40] According to the UN-Habitat a shortcoming in the housing sector is the inadequacy and limitations of housing finance mechanisms.[41] The poor, low- and even the middle-income majority of the population cannot afford a loan for commercially built housing units. These low- or even middle-income households build their own houses progressively over long periods, or they are simply tenants. Initiatives for the upgrading should not entirely rely on governmental subsidies.[42] It can be seen that people want to live in cities, but due to the fact of, for example money, they cannot move to these urban hubs. The phenomenon of development is also seen in South Africa. According to the State of the Cities report,[43] the spatial form of South African cities is more fragmented and the population is more imbalanced and of lower density.[44] Increased pressure is placed on the built environment of cities due to the fact of a stronger population and economic growth. This can also be seen by the proliferation of backyard shacks and informal settlements. However, the established approach of top-down delivery of formal, fully serviced housing to passive communities does not fully meet the people's needs and expectations mostly due to the fact that city authorities are not always planning and managing urban growth effectively.[45]

As was alluded earlier, the built environment (houses, office buildings, manufacturing facilities etc.) contribute to gas (including greenhouse gas) (hereafter GHG)emissions,[46] and if ,for example "green building" is not taken seriously such

39 Agenda 21 of the *United Nations Conference on Environment and Development*, 1992.
40 UN-Habitat Date Unknown www.unhabitat.org. Also see http://www.isocarp.org/index.php?id=659.
41 UN-Habitat Date Unknown www.unhabitat.org.
42 UN-Habitat Date Unknown www.unhabitat.org.
43 See www.sacities.net.
44 Turok 2011 www.sacities.net.
45 Turok 2011 www.sacities.net.
46 See 2.3.

emissions will increase. Buildings are furthermore known to cause environmental and health impacts.[47] These are but a few examples of how the built environment can negatively affect sustainable development, generally, and specifically in the urban context.

Sustainable development has a strong focus on responsible use for resources and so has the notion of "green building" and "green design". The relevance of "green building" with its focus on the limitation of resource use and environmental harm comes to the fore also in Kotzé's view of sustainability as being "the ability to maintain a desired condition over time without eroding natural, social and financial resource bases, through a process of continual improvement in the form of sustainability. Sustainability also relates to the integration of various considerations, including: the environment, the economy, social factors, environmental governance and management efforts, and public and industry involvement. Sustainable results may be achieved through the application and implementation of various principles of sustainability and continual monitoring and post-decision follow-up of the results of these efforts."[48]Viewed against the definition in the *Brundtland Report,* Kotzé's description of sustainability includes the notion, as do "green building" and "green design", that the natural environment must be maintained in a certain desired condition.[49]

### *2.1.2 What are the objectives of sustainable development?*

The relevance of sustainable development in "green building" is not limited to its definition only. The objectives of sustainable development can be divided in three categories: the economy, the (social) community, and the environment. Each of these categories relates to certain objectives, and in the process of attempting to achieve these objectives they almost inevitably have a negative influence on one another. Sustainability demands that a balance be struck between social and economic development and the environment.[50] In the context of the built environment sustainability would thus typically demand a balance between social

47 See paragraph 2.1.2.
48 Kotzé*Integrated Environmental Governance* 254.
49 Kotzé*Integrated Environmental Governance* 254.
50 Bouillon "*VolhoubareGrondontwikkeling*" 62.

and economic development (development among people and economic growth which necessitates *inter alia* the construction of housing and infrastructure) and the protection of the natural resource base (comprising of *inter alia* water and air) that is by default necessary to be able to construct and develop in the built environment.

One of the objectives of sustainable development is to improve the standard of living in a sustained economic development.[51] Sustainable development is ostensibly concerned with the environment and therefore when implemented, it finds its application in local legislation designed to ensure that the sustainability objective is met. Of particular reference here is that studies in public health, which are relevant to a consideration of sustainable development due to the fact that one of the objectives of sustainable development is the promotion of public health, have shown that people in "green buildings" are less susceptible to colds, influenza and asthma as they inhabit buildings where there is access to fresh air, better ventilation systems and environmentally-preferable paint and furniture, for example. Taking into account their kindliness to the environment and the social and economic benefits they bestow on the people who live and work in them, the hypothesis at this point is that "green buildings" should undoubtedly be preferred.[52]

Sustainable development is particularly important in the African context if one considers, for example the fact that Africa has economic uncertainty, intractable conflict, rising prices for food and oil and the effects of climate change on agricultural land are problems that need to be addressed.[53] High-level sustained, inclusive and clean economic growth must be promoted in African countries and is also one of the main focus areas on the continent.[54] However there is an absence of meaningful diversification and transformation in many African countries which is heavily dependent on the informal sector of employment and output. In order to promote economic growth, structural economic transformation involves a process of continuous technological innovation, industrial upgrading and diversification and also the improvement in various types of infrastructure and institutional arrangement

51 Section 2.9 *United Nations Conference on Environment and Development* 1992.
52 Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data /uploads /news/docs/85_doc.pdf.
53 UN Non-Governmental Liaison service 2008 http://www.un-ngls.org/article.php3?id_article=551.
54 Economic Commission for Africa 2011 http://www.uneca.org/era2011/chap6.pdf.

which constitute the context for business development and wealth creation.[55] The natural resource wealth of Africa is often associated with distorted incentives to diversity, a problem compounded by the challenges of an increasingly inadequate water supply, climate change, and an unsustainable demand for fossil fuels which must be addressed at the consumer level in developed as well as in developing countries.[56]

The need for sustainable development globally and in Africa is also taken seriously within South Africa. South Africa's National Strategy and Action Plan for Sustainable Development of 2010[57] (hereafter the Strategy) for example provides that two main categories of intervention are proposed in order to support the new social goals that are based on sustainability. The first main category is the introduction of incentives/disincentives and fiscal measures and the second main category is education and awareness-raising programmes which foster a better understanding of the relationship between human well-being, biodiversity and ecosystems. Some of the incentives/disincentives and fiscal measures proposed to be used in order to promote more environmentally responsible behaviour include: increasing energy efficiency, decreasing the use of fossil fuels, increase usage of renewable energy, decreasing pollution and the generation of general waste and re-localising production as is reasonably possible to strengthen local economies and reduction of energy consumption and transportation cost.[58] The Strategy further states that "in order to achieve the awareness required to support a change in the goals of society, will require the enlisting of a wide variety of non-governmental organisations."[59] This Strategy also addresses the establishment of sustainable communities. In order to be sustainable, the diverse needs of human settlements must be met; this includes housing, basic services, community facilities, transport and livelihood/job opportunities, while at the same time being sensitive to the surrounding ecosystems and the natural environment. The specific goals in order to meet these needs are

55 Economic Commission for Africa 2011 http://www.uneca.org/era2011/chap6.pdf.

56 Drexhage and Murphy 2010 "Sustainable Development: From Brundtland to Rio 2012" 2. Also see Economic Commission for Africa 2011 http://www.uneca.org/era2011/chap6.pdf

57 Also see http://www.environment.gov.za/Services/documents/PublicParticipation/NSSD.pdf.

58 Department of Environmental Affairs 2010 http://www.environment.gov.za/Services/documents/PublicParticipation/NSSD.pdf.

59 See paragraph 2.2.2.

enhancing spatial planning, to ensure universal access to basic and community services, to improve the standard/quality of housing and other structures to optimise resources, promoting self-sufficiency, food security and equitable access to natural resources that support livelihoods and to improve equity, security and social cohesion.[60]Obviously, "green building" as an approach to construction and development would fit the objectives of this Strategy and the objectives of sustainable development, generally.

One can however not perceive the objectives of sustainable development to be a national government mandate or issue only. It is internationally acknowledged that local authorities have a major role to play in sustainable development. One of the international non-governmental initiatives is Local Governments for Sustainability that is committed to sustainable development (hereafter referred to as the ICLEI).[61]ICLEI is divided into five programs promoting sustainability and "Building Sustainable Cities" is one of the programs. This program encourages local governments to work with local stakeholders in order to address inter-related challenges to poverty and sustainability.[62] ICLEI in its "Building Sustainable Cities"-program seeks to build sustainable communities and cities by enabling local government to achieve justice, security, resilience, viable economies and healthy environments, for example.[63]Local Agenda 21 is another internationally acknowledged process that is applied in local communities in which the focus is on social and economic development. Local Agenda 21 in essence entails participation at the local level to achieve sustainability objectives. Local Agenda 21 gives an opportunity to local communities to develop a sustainable development strategy for itself, which can influence the decisions taken by the municipality and therefore achieve the objectives of sustainable development.[64]

60 Department of Environmental Affairs 2010 http://www.environment.gov.za/Services/documents/PublicParticipation/NSSD.pdf.
61 See http://www.iclei.org/index.php?id=about.
62 Local Governments for Sustainability Date Unknown http://www.iclei.org/index.php?id=about.
63 Local Governments for Sustainability Date Unknown http://www.iclei.org/index.php?id=about.
64 Bouillon "*VolhoubareGrondontwikkeling*" 77.

In South Africa it is also strongly believed that what municipalities do can contribute to sustainable development as is shown and further discussed in paragraph 4 below.

### *2.1.3 Linking the objectives of sustainable development with "green building" and "green design"*

Before delving deeper into the meaning and parameters of "green building" and "green design" it merits to mention that there are many ways in which to move towards sustainable development and that "green building" and "green design" is one such way. When one considers the view that the objectives with "green building" and "green design" include design efficiency, energy efficiency, water efficiency, materials efficiency, improved indoor air quality and waste reduction[65] it is evident that there is a direct link between "green building" and "green design" and sustainable development. Bearing in mind the need for and drive towards development in developing countries such as South Africa (with its water and other natural resource pressures), "green building" and "green design" may increasingly be necessary in especially the urban areas of the country. In these areas, local authorities often have significant regulatory and decision-making powers as is further illustrated in paragraph 4 below.

## ***2.2 "Green design" and "green building"***

Green building dates back to the 1970s (and even further to the 1800s) when Becquerel witnessed the transformation of solar energy into electrical energy, known as photovoltaic power.[66] During the 1970s, when there was an energy crisis, builders and designers were looking to reduce the reliance of buildings and homes on fossil fuels.[67] Solar panels were introduced in small numbers because of the initial cost, but since then engineers have constructed more efficient and less expensive solar panels. Since the 1970s the earth's richest energy source, sunlight, has been the subject of ever more efficient and enthusiastic exploitation, and the building materials

65 Prentice 2010 http://articlestorehouse.com/Art/90071/216/6-Objectives-of-Green-Building.html.
66 Stone 2011 http://www.brighthub.com/environment/green-living/articles/51601.aspx.
67 Stone 2011 http://www.brighthub.com/environment/green-living/articles/51601.aspx.

in common use have been examined with their ecological effect in mind.[68]Against this background, the following section looks into what are "green building" and "green design" and what are the relevance of "green building" and "green design" to South Africa and specifically to South African municipalities.

### *2.2.1 "Green design" and "green building"*

Buildings, including office blocks, manufacturing facilities and homes, account for more than 40 percent of the world's total energy consumption.[69] They also produce around a third of the world's total GHG emissions.[70] It is for this reason that the view has been expressed that if "green buildings" were constructed and "green design" was implemented, the environmental impact of the built environment would be reduced.[71]

In the context of "green building" and "green design", a "building" can be defined as any structure, whether of a temporary or permanent nature and irrespective of the materials used in the erection thereof, erected or used for or in connection with: the accommodation or convenience of human beings or animals; for the manufacture, processing, storage, display or sale of goods; the rendering of any service; the destruction or treatment of refuse or other waste materials; the cultivation or growing of any plant or crop. A "building" also includes any wall, swimming pool, reservoir or bridge or any other structure connected therewith, any fuel pump or any tank used in connection therewith; or any part of a building as defined above. A "building" is also any structure providing for facilities or systems, or parts or portions thereof, within or outside but incidental to a building, for the provision of a water supply, drainage, sewerage, stormwater disposal, electricity supply or other similar service in respect

68 Stone 2011 http://www.brighthub.com/environment/green-living/articles/51601.aspx.

69 Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data /uploads/news/docs/85_doc.pdf. Also see Siemens 2010 http://www.us.siemens.com/sustainable-cities/ index.html.

70 Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data /uploads/news/docs/85_doc.pdf. Also see Siemens 2010 http://www.us.siemens.com/sustainable-cities/ index.html.

71 Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data /uploads/news/docs/85_doc.pdf. Also see Siemens 2010 http://www.us.siemens.com/sustainable-cities/ index.html.

of the building.[72] It is thus possible to conclude that the notion of "green building" and "green design" extends beyond the construction by government and public authorities to also include building, design and construction by the private sector, the industrial sector including mines, multi-national companies and other industries.[73]

"Green building" and "green design" focuses to a large extent on energy efficiency and the latter must be clear for a thorough understanding of "green building" and "green design" or sustainable building. To define energy efficiency it is important to distinguish between efficiency and conservation. Conservation is defined as saving energy and may involve doing without certain utilities. One who is dedicated to the conservation of energy may be satisfied with eating cold meals, taking cold showers, not driving one`s motor vehicle, and forgoing electronic entertainment, for example. Efficiency on the other hand means utilising all of the available amenities but using less energy to do so.[74] "Green building" and "green design" comes to a large extent down to energy efficiency.[75]

Kunszt[76] furthermore defines sustainable construction as "the creation and responsible management of a healthy built environment based on resource efficient and ecological principles." The Royal Institution of Chartered Surveyors (RICS)[77] also gives a definition of green building: "a sustainable building or green building is an outcome of a design philosophy which focuses on increasing the efficiency of resource use, including energy, water and materials, while reducing building impacts on human health and the environment during the building life cycle through better siting, design, construction, operation, maintenance and removal." The author is therefore of the preliminary opinion that "green building" and "green design" in conservation and efficiency can be regarded as an exercise to *inter alia* save energy

72 Section 1 of the NRBS.
73 Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data/uploads/news/docs/85_doc.pdf.
74 Strydom and Surridge "Energy" 765-809. The waste products of energy systems are discarded into the physical environment. These specific waste products include degenerated heat that comes into existence as a by-product of heat engines. These impacts of energy on the environment may be addressed on three levels namely: the micro level, the macro level and the global level.
75 Kidd *Environmental Law* 322.
76 KunsztG as referred to in Buys and Hurbissoon*ActaStructilia*86.
77 RICS as referred to in Buys and Hurbissoon*ActaStructilia*86. Also see http://www.rics.org for more information.

with or without supplying all of the usual amenities, in accordance with the objectives as entrenched in *inter alia* South Africa's Bill of Rights (chapter 2 of the Constitution).

A "green building" *per se* is a building that is environmentally sustainable, designed, constructed and operated to minimise its total environmental impact.[78] When a "green building" is planned, this involves site planning which must be conducted to ensure sustainability and water conservation through the whole life cycle of the building.[79] Some of the reasons as to why there is a movement towards erecting "green buildings" include to save money, to increase comfort, and to create a healthy environment for people to live and work in. The main objective of "green building" is to create an environment that is fully sustainable for current and future generations. "Green building" is also known as "eco-design", "eco-friendly architecture", "earth-friendly architecture", "environmental architecture" and "natural architecture".[80] For purposes of this study, these are regarded as synonyms of "green building", and therefore the term "green building" and "green design" are used.

If one were to devise a checklist to determine how "green building" and "green design" could be attained as an objective, it might include, amongst other, the need for a transition to renewable energy alternatives and energy efficiency, the emergence of a renewable energy economy as a result of new "green" items that are required by by-laws, and the production of zero waste via the re-use of all used materials.[81] Such a checklist, as was argued above, would also be largely reminiscent of what is necessary for sustainable development in the built environment.

### *2.2.2 Relevance of "green design" and "green building" in South Africa*

This study is concerned with the role of "green design" in local governance in South Africa. This necessitates an evaluation of the relevance of "green building" in the country, generally. The idea of "green building" and "green design" is driven in South

78 Organisation for Economic Co-operation and Development 2003 http://www.buildgreen.co.nz/definition.html.
79 United States Green Building Council 2006 http://www.ctenergyinfo.com/greenbuildings.html.
80 Craven Date Unknown http://architecture.about.com/od/greenconcepts/g/green.htm.
81 Swilling 2006 *Environment and Urbanisation* 45-49.

Africa by the Green Building Council of South Africa (GBCSA).[82] The GBCSA was established in 2007 and it is South Africa's official representative at the World Green Building Council.[83] South Africa`s first voluntary green building rating tool, the Green Star SA, was launched by the GBCSA in Cape Town in 2008. The Green Star SA tool is aimed to calculate the environmental attributes of new commercial office buildings as well as the major base building refurbishment of existing office facilities.[84] The tool has been designed to be used by building owners, developers and consultants, and to minimise the environmental impact of the development. This tool was not designed to address the economics of green building but rather the environmental impact of property development.[85] The tool consists of eight environmental categories, which include energy, indoor environment quality, management, transport, water, materials, land-use and ecology, emissions and an innovative category.[86] Developers are encouraged to build according to the requirements set for the eight categories. In meeting the requirements, they may contribute to the move towards sustainable environment.[87] The relevance of this tool lies therein that it calculates environmental attributes and help to minimise the environmental impact that these attributes may have on the environment when erecting buildings.

The relevance of "green building" and "green design" in South Africa lies in the direct link between the former's objectives and the need to protect the natural resource base. It is a known fact that the world climate is changing.[88] Presently the global climate changes rapidly as a result of global warming, among others, the melting of polar and glacier ice, the sea level rising, ocean acidification, changes in rainfall and snowfall patterns, frequent floods and draughts and increased extreme weather events. Due to climate change, it does not allow the earth's bio-physical systems to

82 See http://www.gbcsa.org.za.
83 Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data/uploads/news/docs/85_doc.pdf.
84 Davenport 2008 http://www.engineeringnews.co.za/print-version/sas-first-green-building-rating-tool.
85 Davenport 2008 http://www.engineeringnews.co.za/print-version/sas-first-green-building-rating-tool.
86 Davenport 2008 http://www.engineeringnews.co.za/print-version/sas-first-green-building-rating-tool.
87 Davenport 2008 http://www.engineeringnews.co.za/print-version/sas-first-green-building-rating-tool.
88 GN 757 in GG 34695 of 19 October 2011.

adapt to these changes mentioned above, naturally.[89] By promoting "green building" and "green design" greenhouse gas emissions could be lowered and the phenomenon of climate change be addressed (also in the South African context).

South Africa's prime energy resource is coal, which can be exploited irresponsibly.[90] Energy efficiency is one of the objectives of "green building" and "green design" and this objective will not be promoted if countries remain reliant on coal-based energy generation.[91] "Green building" and "green design" could therefore assist in reducing dirty, coal-based energy generation.

An important natural resource is water, which is of great importance in South Africa. Due to the urbanisation of people, the expansion of settlements, mining, and industrialisation, water became a scarce natural resource which also has the risk of contamination.[92] Water problems in South Africa are not a new phenomenon and due to climate change more intense and longer droughts have been noted.[93] The *Water Services Act* 107 of 1998 has introduced a water services development plan that requires municipalities to consider how they will restrain water use.[94] "Green building" and "green design" can contribute to the protection of scarce and vulnerable natural resources such as water through technology that can be used to promote water conservation and to manage water demand, for example.[95]It is possible for instance, to install low-volume flush toilets.[96] Another instrument is operational, and includes the efficient management and reduction of leaks and breaks in the distribution system.[97] "Green building" and "green design" can therefore assist towards achieving climate change mitigation objectives and can also assist in protecting scarce resources such as water.

89 GN 757 in GG 34695 of 19 October 2011.
90 Strydom and Surridge "Energy" 765-809.
91 See par 2.1.3.
92 Department of Water Affairs 2000 www.dwa.gov.za.
93 GN 757 in GG 34695 of 19 October 2011.
94 Muller 2008 *Environment and Urbanisation*77.
95 Muller 2008 *Environment and Urbanisation*77.
96 Muller 2008 *Environment and Urbanisation*77.
97 Muller 2008 *Environment and Urbanisation*77.

### *2.2.3 Relevance of "green design" and "green building" for South African municipalities specifically*

The principle of subsidiarity is entrenched in section 156(4) of the Constitution and it is more relevant in "green building" and "green design" than one may immediately think. In South Africa, municipalities are co-responsible for natural resource conservation with the other two spheres of government and they are responsible for several areas of regulation within the planning, development and construction context including building regulations, air quality control, noise control etc. Taking that "green building" and "green design" have everything to do with these areas of competence of local government, the logical inference is that for sustainable development locally, "green building" and "green design" may be particularly important and relevant. This view has also been adopted by some municipalities in South Africa as will be shown with the discussion of the two case studies in paragraph 5 below.

### *2.2.4 Concluding remarks*

From the above it is clear that the notion of green building is not a new concept.[98] It has formed part of the design and construction sciences for a number of years and has been inspired by global moves towards sustainability.[99] The South African government`s commitment to sustainability is a constitutionally entrenched environmental mandate, and given the vulnerability of the country`s natural resource base, it seems imperative for South Africa to consider and optimise the opportunities presented by green building.[100] South Africa already has framework laws regulating building and design (as discussed in paragraph 3 below) and these would serve as a basis for the explicit inclusion of provisions (also at the local level) that could facilitate the design of "green buildings" and the use of building materials that are environmentally friendly and aimed at reducing the use of scarce natural resources.[101]

98 See paragraph 2.2.
99 See paragraph 2.1.3.
100 See paragraph 2.2.2.
101 See paragraph 2.2.2.

# 3 "Green building" and "green design": the law and policy framework in South Africa

## *3.1 Introduction*

As mentioned previously, South Africa is constitutionally bound to environmentally sustainable development. Since "green building" and "green design" constitute a dimension of sustainable development it is of great relevance that the legislature has enacted the *National Building Regulations and Building Standards Act* 103 of 1977 (hereafter the NRBS). The NRBS is the act that regulates building regulations and building standards in South Africa. The different sections of the NRBS will be discussed below to determine what the existing responsibilities of municipalities are concerning "green building".

## *3.2 The National Building Regulations and Building Standards Act 103 of 1977 (NRBS)(as amended)*

### *3.2.1 Objectives of the Act*

One of the objectives of the NRBS is to provide for the promotion of uniformity in the law that relates to the erection of buildings in areas where local authorities have jurisdiction. Another objective of the act is to prescribe building standards and to regulate any matter that is concerned with building standards.[102]

### *3.2.2 Relevant provisions*

#### 3.2.2.1 Local government approval of applications in respect of the erection of buildings

Municipalities are responsible for approving the plans and specifications for the erection of all buildings.[103] The approval by a local authority must be in writing before

102 Preamble of the NRBS.
103 Section 4 of the NRBS.

any building may be erected.[104] The application form must be accompanied by such plans, specifications, documents and information as may be required by the local authority.[105] The local authority can therefore in principle approve or disapprove of the erection of a building on the basis of the extent to which it is a "green building" and energy efficient. If a building is not "green" however, and not energy efficient, the local authority could therefore disapprove of the development on the basis that the building must be energy efficient and "green". Local authorities thus have the power to encourage the construction of more "green buildings" and to insist on energy efficiency. A by-law would however be necessary to enforce any rules of this kind.

#### 3.2.2.2 Erection of buildings in certain circumstances subject to prohibitions or conditions

The erection of buildings in certain circumstances is subject to prohibition conditions.[106] Such prohibition or special conditions may arise from the fact that a building or earthwork in the opinion of the local authority is erected in such a manner that the erection is detrimental to good health or hygiene.[107] However subsection (1)(a) of the NRBS leaves it unclear as to whether the features listed above relate to the building or the earthwork itself.[108] In this study it will be assumed that the reference is to the building. As stated in section 24 of the Constitution, everyone has the right to an environment that is not harmful to their health or well-being.[109] Therefore if a building is erected in such a way that it affects human health and hygiene detrimentally, the objective of section 24 of the Constitution is being countered. By virtue of the constitutional powers and environmental duties of municipalities such a building may need to be prohibited or to have certain conditions imposed on its development.

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104 Section 4(1) of the NRBS.
105 Section 4 of the NRBS.
106 Section 10 of the NRBS.
107 Section 10(1)(a)(i) of the NRBS.
108 Freeman *The National Building Regulations* 14.
109 See 3.1.1.

#### 3.2.2.3 Regulations to the Act

The Minister may, after consultation with the Board[110] make regulations that are known as building regulations according to the NRBS. The Minister indeed made regulations for the environmental sustainability of buildings.[111] The Minister after consultation with the Board may prohibit the use of certain building methods or materials that is mentioned in the regulations. The Minister may also prohibit any method or material that is used or is to be used in the erection of any building that is not in the public interest or that would be dangerous to life or property.[112]

### *3.2.3 Links with and possibilities in relation to the notion of "green building" and "green design"*

Although the NRBS does not specifically make reference to "green building" or "green design" the Minister (Minister of Trade and Industry), has the power to incorporate "green building" and "green design" in the regulations that is made to the act. This has been done as is evidenced by the regulation[113]which the Minister of Trade and Industry approved, in which reference is made to energy usage in buildings.[114]

### *3.2.4 Implication of the Act for municipalities*

As see above, municipalities are responsible for approving building plans and therefore are bound by legislation and specifications.[115] This include that municipalities must see to it that energy usage in buildings are controlled. Therefore municipalities have the obligation to see that energy usages in buildings are controlled, and indirectly that "green building" and "green design" are promoted based on the fact that energy efficiency is one of the objectives of sustainable

110 Section 1 of the NRBS. "Board" means the Board defined in section 1 if the *National Regulator for Compulsory Specifications Act* 5 of 2008. Section 1 of the *National Regulator for Compulsory Specifications Act* 5 of 2008 defines "Board" as the Board of the National Regulator for Compulsory Specifications appointed in terms of s 6.
111 GG R 711 no 34586 of 9 September 2011.
112 Section 19(1) of the NRBS.
113 GG R 711 no 34586 of 9 September 2011.
114 See paragraph 3.3.
115 See paragraph 3.2.2.1.

development in "green building".[116] If building plans and specifications indeed do not control energy usage of the specific building, the municipality has the power to disapprove the erection of the specific building.[117]

### *3.2.5 Strengths and weaknesses of the Act*

Identified weaknesses include the fact that no reference is made to materials that can be used to build buildings that minimise the harm to the environment, or to measures by means of which to remove the harmful materials after it has been used. This weakness can be explained through the fact that the NRBS has been promulgated in 1977 and the last amendment to the NRBS was in 1995.[118] Although "green building" and "green design" date back to the 1970s,[119] South Africa only acknowledged the notion of "green building" and "green design" when the GBCSA was established in 2007.[120] Maybe for this reason "green building" and "green design" materials were not originally included into the NRBS. This argument supports the notion that the act did not keep track with developments that cause environmental degradation and pollution or advance new technology. The problems that caused environmental degradation and pollution in the twentieth century differ from problems that currently exist. A strength of the NRBS, lies in section 17 where the NRBS states that the Minister may make alternative regulations to the act.[121] These regulations may address "green building" and "green design", for example.

## ***3.3 The South African Bureau of Standards (SABS)***

The objectives of the South African Bureau of Standards (hereafter SABS) will be discussed due to the fact that the National Committee SABS approves or disapproves the South African standards on building regulations, and SANS is developed according to the objectives of the SABS.[122]

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116 See paragraph 2.1.2.
117 See paragraph 3.2.2.1.
118 National Building Regulations and Building Standards Amendment Act 49 of 1995.
119 See paragraph 2.2.
120 See paragraph 2.2.2.
121 See paragraph 3.2.2.3.
122 National Committee SABS 2011 www.sabs.co.za.

### *3.3.1 Objectives of the SABS*

The objectives of the SABS are to promote quality in connection with commodities, products and services.[123] In order to achieve these objectives, the SABS may develop, issue, promote, maintain, amend or withdraw South African national standards and related normative publications that serve the standardisation needs of the South African community.[124]

The SABS may also provide reference materials, conformity assessment services and related training services in relation to standards.[125] In order to promote sustainability, the SABS may provide reference materials that promote environmental responsibility. It may also mount research and development programmes in response to the perceived need for new standards, the improvement of existing standards, the standardisation of test methodology, and the sketching of future scenarios that might affect the standards environment.[126] Therefore more research and a development programme could, for example, be developed by the SABS in order to promote "green building" and "green design". This programme could, *inter alia*, be used as a guide for municipalities to incorporate this programme their IDPs[127] and planning bylaws[128] to achieve national sustainability objectives with regard to "green building" and "green design".

South African national standards incorporated in law affect the safety and health of the public, and environmental protection,[129] but environmental protection will be truly achieved only once the regulation off environmental sustainability in building is effectively implemented at the local level.[130]

123 Section 1(b) of the *Standards Act* 8 of 2008.
124 Section 2(a) of the *Standards Act* 8 of 2008.
125 Section 2(b) of the *Standards Act* 8 of 2008.
126 Section 2(i) of the *Standards Act* 8 of 2008.
127 See paragraph 3.1.3.
128 See 4.3.2.2.3.
129 Section 28(1) of the *Standards Act* 8 of 2008.
130 GG R 711 no 34586 of 9 September 2011.

### *3.4 Introduction of requirements for energy usage in buildings*

#### *3.4.1 Introduction*

SANS 10400-XA: 2011, which has been developed according to the SABS, will be discussed hereafter. This SANS code has been developed to promote energy efficiency in buildings. The content thereof is briefly considered in order to determine how the code or standard promotes or could potentially promote, "green building" and "green design" in South Africa.

#### *3.4.2 Relevant provisions to the amendments to the national building regulations*

The Minister of Trade and Industry may issue National Building Regulations in terms of the NRBS,[131] and compliance with this regulation is mandatory.[132] There are three ways in which a builder has to comply with National Buildings Regulations, the first being compliance with the Deemed-to-Satisfy Standards,[133] which are SANS 10400 (also known as SABS 0400). The second is conforming to a rational assessment or design by a competent person that is approved by a local authority, and the third is the use of material/systems that are tested and certified by the Board of Agrément South Africa.[134]

SANS 10400-XA: 2011 promotes efficient energy usage in buildings.[135] In terms of this Standard, buildings must be designed and constructed so that the building is capable of using energy efficient methods, while it fulfils the needs of the user in relation to vertical transport (if any), thermal comfort, lighting and hot water.[136] The requirement of sub-regulation XA1 shall be deemed to be satisfied if a building has

131 Section 17(1) of the NRBS.
132 Dekker 2008 http://www.saiat.org.za/NBR%20AND%20DTS%20STANDARDS.pdf.
133 National Committee SABS 2011 www.sabs.co.za defines "deemed-to-satisfy standards" as non-mandatory requirements, and if complied with this requirement, it ensures compliance with a functional regulation.
134 Dekker 2008 http://www.saiat.org.za/NBR%20AND%20DTS%20STANDARDS.pdf. Also see National Committee SABS 2011 www.sabs.co.za. The Board of Agrément South Africa is a body that operate under the delegation of authority (the Minister of Public Works).
135 XA1(a) of GG R 711 no 34586 of 9 September 2011.
136 XA1(a) of GG R 711 no 34586 of 9 September 2011.

an orientation, shading, services and building envelope,[137] in a way that the annual energy consumption and demand is less than or equal to the values that is specified by SANS 10400-XA: 2011.[138] The requirement shall also be deemed fit if the "rational design is by a competent person who demonstrates that the energy usage of such a building is equivalent to or better than that which would have been achieved by compliance with the requirements of SANS 10400-XA".[139] A building is to be designed and constructed in accordance with theoretical energy usage performance (determined by using certified thermal calculation software) less than or equal to that of a reference building in accordance with SANS 10400-XA.[140]

A building should also be designed and constructed so that it has features and services which facilitate the efficient use of energy appropriate to its function and use, the internal environment, and its geographical location.[141]This is for example when the rooms in a building that will be used most often, are placed on the northern side of the building in order to allow solar heat to penetrate the rooms during the winter months.[142] The spaces that are used less, such as bathrooms and storerooms, can be used to screen the unwanted western sun.[143]Electrical resistance heating that includes but is not limited to solar heating, heat pumps, heat recovery from other systems or processes and renewable combustible fuel must be implemented in order to provide at least 50 percent by volume of the annual average hot water heating requirement.[144]

137 X1 of the GG R 711 no 34586 of 9 September 2011 defines a building envelope as meaning the elements of a building that separate a habitable room from the exterior of a building or a garage or storage area.
138 National Committee SABS 2011 www.sabs.co.za. SANS 10400-XA specified tables in which the maximum energy demand per building is classified for each climate zone and a description of the building.
139 XA3(b) of the GG R 711 no 34586 of 9 September 2011.
140 XA3(c) of the GG R 711 no 34586 of 9 September 2011.
141 XA1(b) of GG R 711 no 34586 of 9 September 2011.
142 National Committee SABS 2011 www.sabs.co.za.
143 National Committee SABS 2011 www.sabs.co.za.
144 XA2 of the GG R 711 no 34586 of 9 September 2011.

### *3.4.3 Links with and possibilities in relation to the notion of "green building" and "green design"*

As shown above, SANS 10400-XA: 2011 promotes energy efficiency in buildings[145] which directly links with the key objective of "green building" and "green design".[146] SANS 10400-X finds its application to environmental sustainability in the national building regulations, whilst SANS 10400-XA applies to energy usage in buildings.[147] If "green building" and "green design" measures are taken into account in the different phases of planning and construction, the environmental impact of the built environment would be reduced,[148] achieving the SABS objective.

### *3.4.4 Implications of SANS 10400-XA: 2011 for municipalities*

Municipalities must ensure that the National Building Regulations are met in building plans,[149] and therefore it can be seen that local authorities have an important role to play in promoting "green building" and "green design" through applying SANS 10400-XA: 2011. Municipalities must approve all building plans, within their jurisdiction and must see to it that SANS 10400-XA: 2011 are complied with. It may therefore be expected of municipalities to use their legislative and executive powers in a way that will result in compliance with SANS 10400-XA: 2011. For this reason the content and implementation of applicable by-laws and a municipality's IDP are important.

### *3.4.5 Strengths and weaknesses of SANS 10400-XA: 2011*

SANS 10400-XA: 2011 is relatively unknown, since the document was only published in August 2011 and the regulation[150] first came into effect in November 2011. Therefore it has not yet been fully implemented and tested in the local government environment. Contractors are familiar with conventional materials and construction methods and not with "green building" materials and methods as

145 See 3.3.2.
146 See paragraph 2.1.2.
147 National Committee SABS 2011 www.sabs.co.za.
148 See 2.2.1.
149 Dekker 2008 http://www.saiat.org.za/NBR%20AND%20DTS%20STANDARDS.pdf.
150 GG R711 no 34586 of 9 September 2011.

required in SANS 10400-XA. Therefore contractors and developers are advised to familiarise themselves with "green" materials and "green building" techniques in order to achieve the national standard and to comply with SANS 10400-XA: 2011.[151] Also, SANS 10400-XA: 2011 does not address existing buildings, only buildings that is on plan and still need to be approved by municipalities.

A major strength of SANS 10400-XA: 2011 is that it clearly promotes energy efficiency in buildings, across South Africa. If these nationally applicable standards are applied and implemented correctly, it could contribute to an environment that is more sustainable at different levels and in different sectors and it could also contribute to promoting the notions and benefits of "green building" and "green design" across the country.

## 4 Legal framework for "green building" and "green design" at the local level

### *4.1 Introduction*

In order for local government to actively pursue sustainable development through, *inter alia*, "green building" and "green design", it is essential for municipalities to have the necessary legally entrenched powers and functions to govern. Put differently, it is necessary for South African law and policy to create a suitably enabling framework for municipalities to be able to explore locally, the opportunities posed by "green building" and "green design". This section explains what local government is and considers the law and policy framework on local government which includes the Constitution, the Systems Act, NEMA and White Papers relevant to "green building" and "green design".

### *4.2 What is local government?*

To answer the question of what a local government is, one must consider its kinetic, formative environment as described in the sciences of geography, political science

151 Buys and Hurbissoon *ActaStructilia*97.

and public administration, as well as its static, legal structure. This can be seen as the corner posts of local government.[152] Du Plessis defines a government as a group of institutions or people that governs a state.[153] This means that the government dictates the general direction of public affairs.[154] Local government then is the sphere that is closest to the people.[155]

Its closeness to the people gives rise to the need to apply the principle of subsidiarity to it.[156] De Visser defines subsidiarity as a general principle that says that "governance should take place as close as possible to the citizens. This thought translates into the protection of lower levels of government against undue interference by national or provincial government. It also translates into a preference for placing functions and powers at the lowest possible levels of government".[157]Therefore, when applying the principle of subsidiarity, the implementation of building regulations should be delegated to municipalities in order that this function could be fulfilled by the sphere of the state that is close to the people and to where development takes place.

Local government in South Africa has been reformed in many aspects. A total number of 283 municipalities make up the local government sphere.[158] The constitutional mandate of local government is to focus on "developmental local government",[159] which is described in the *White Paper on Local Government,* 1998 as being committed to "work with citizens and groups within the community to find sustainable ways to meet their social, economic and material needs and improve the quality of their lives".[160]

The characteristics and functions of local government emphasises the idea that local government can play an important role in relation to the environment as one of the

152 Meyer *Local Government Law* 3.
153 Du Plessis *South Africa's Constitutional Environmental Right* 100.
154 Du Plessis *South Africa's Constitutional Environmental Right* 100.
155 Bekink*Principles of South African Local Government Law* v.
156 De Visser*Local Government Bulletin* 16-17.
157 De Visser*Local Government Bulletin* 16-17.
158 Section 40 of the Constitution.
159 Du Plessis *Stellenbosch Law Review* 265.
160 *White Paper on Local Government,* 1998. See paragraph 4 for further discussion.

pillars of sustainable development. Du Plessis defines local environmental governance as a specific form of governance as:[161]

> The management process executed by local government and communities to holistically regulate human activities and the effects of these activities in their own and the total environment (including all environmental media, and biological, chemical, aesthetic, cultural and socio-economic processes and conditions) at local levels; by means of formal and informal institutions, processes and mechanisms embedded in and mandated by law, so as to promote the present and future interest human beings hold in the environment. This management process necessitates a collection of legislative, executive and administrative functions, instruments and ancillary processes that could be used by local government, the private sector and citizens to pursue sustainable behaviour within the community as far as products, services, processes, tools and livelihoods are concerned, both in a substantive and procedural sense.

The above mentioned definition of local environmental governance highlights the principle of sustainable development, as it states that present and future processes must be promoted and that local authorities should govern people and processes in the environment in a sustainable manner. Local government therefore has a role in environmental governance in South Africa, which can be seen in the Constitution[162] and also in the Municipal Systems Act. Due to the principle of subsidiarity municipalities furthermore have the power to enforce regulatory mechanisms directed at "green building" and "green design" as a dimension of local environmental governance and sustainable development.[163]

### *4.3 The law and policy framework on local government and sustainable development in South Africa*

This section discusses and applies the relevant law and policy frameworks that are applicable to local government in order to promote and achieve sustainable development in South Africa. The constitutional mandate, the Systems Act, the NEMA, and relevant White Papers to "green building" and "green design" are discussed below.

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161 Du Plessis *South African Public Law* 58.
162 Explained in paragraph 4.3.1.
163 Discussed in 4.3.2.

### *4.3.1 The Constitution of the Republic of South Africa*

#### 4.3.1.1 The Bill of Rights

It can be argued that section 24 of the Constitution attempts to achieve two objectives. The first objective of this section is to guarantee that everyone has the right to an environment that is not harmful to their health or well-being.[164] Secondly, in sub-section 24(b) it is presumed that there is a specific mandate placed on the State (including municipalities) to take the necessary steps to consummate the aim in sub-section 24(a). Furthermore sub-section (b) assumes that there is a negative obligation on the State to withdraw from measures that may cause environmental degradation or that may generally impair the right guaranteed in sub-section (a).[165]

Taking into account the fundamental right that is listed in section 24 of the Constitution, the assumption can be made that "green building" and "green design" have an indirect impact on the right to have adequate housing,[166] as well as the right to sufficient food and water.[167] All of the fundamental rights, which include the rights listed above, must be balanced, as suggested by section 24 of the Constitution.[168] As shown above, if natural resources are not correctly managed and energy efficiency is not strived for (including through "green building" and "green design"), this could essentially infringe on people's fundamental human rights.[169]

The next paragraph will study the nature, role, functions and powers of local government according to chapter 7 and Schedules 4(B) and 5(B) of the Constitution. The objective of this paragraph is to highlight the role that local government could play, by virtue of its powers and functions in achieving and promoting "green building" and "green design".

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164 Section 24(a) of the Constitution.
165 Brand and Heyns*Socio-Economic Rights in South Africa* 257.
166 Section 26 of the Constitution.
167 Section 27(1)(b) of the Constitution.
168 Glazewski*Environmental Law in South Africa* 68.
169 See 2.4

4.3.1.2 Chapter 7 and Schedules 4(B) and 5(B): Local Government

The Constitution divides municipalities into different categories which are regulated in the *Local Government: Municipal Structures Act* 117 of 1998 (hereafter the Structures Act). A metropolitan municipality is a category A municipality. The metropolitan municipality has executive and legislative authority within its area of jurisdiction.[170] The areas where a metropolitan municipality has jurisdiction include areas of intensely developed conurbations with high populations and the intense movement of people, goods and services; centres of economic activity with complex and diverse economies; single areas for which integrated development planning is necessary; and areas with strong interdependent social and economic linkages between the constituent units.[171] Cape Town[172] is for example a metropolitan municipality and possesses all the above mentioned characteristics as will be discussed in paragraph 5.

The Constitution provides that South Africa is divided into municipalities which are established for governance of the whole of South Africa, "wall to wall".[173] This necessitated the principle of "smaller" local governments. For example, a category B municipality is a local municipality, and a category C municipality is a district municipality.[174] Category B and category C municipalities do not have the characteristics of metropolitan municipalities.[175] The powers of district and local municipalities are defined in the Municipal Structures Act in section 6. However, section 83(3) of the Municipal Structures Act states that a district municipality must seek to achieve the integrated, sustainable and equitable social and economic development of its area. The district municipality can achieve this objective by ensuring that the whole district has an integrated development plan (IDP); by promoting bulk infrastructure development and services for the district as a whole; by building the capacity of local municipalities in its area to perform their functions and exercise their powers where such capacity is lacking; and by promoting the equitable distribution of resources between the local communities in its area to

170 Section 155(1) of the Constitution.
171 Section 2 of the Municipal Structures Act.
172 Cape Town is discussed in paragraph 5.
173 Currie and de Waal *Constitutional and Administrative Law* 216.
174 Section 155(1) of the Constitution.
175 Section 3 of the Municipal Structures Act.

ensure appropriate levels of municipal services within its area.[176] The distinction between the different types of municipalities is of importance, because the existence of these distinctions implies that their ability and authority to address "green building" and "green design" could differ.

An obligation rests on the municipalities to function according to the Constitution where, in sections 24, 153 and 156 their duties and responsibilities are established (including an environmental responsibility). When the objectives of local government are taken into consideration, it is evident that a responsibility rests with a local government to ensure that services to communities are delivered in a sustainable manner[177] and also to promote an environment that is safe and healthy for all to live in.[178]From this one can derive that there is a duty placed on a municipality to deliver services, which to some extent encapsulates the encouragement of "green building" and "green design" in such a way that the aim of sustainability could be reached as well as the objective of a safe and healthy environment envisaged by the Constitution. Section 24 and chapter 7 of the Constitution place environmental responsibilities on municipalities and it can be seen that these environmental responsibilities are wide enough to include the promotion of "green building" and "green design".

The achievement of the objectives of a municipality (to promote a safe and healthy environment) depends on the size of the municipality and also the financial contribution the municipality can make to sustaining "green building" and "green design". Despite the fact that municipalities are independent and must fulfil their own duties and responsibilities, municipalities are still dependent on national and provincial government[179] for income generation and overall policy direction.

The Constitution provides only the basic guidelines for municipalities to follow in fulfilling their duties and responsibilities. Municipalities' powers are divided into two

176 Section 83 (3) of the Municipal Structures Act.
177 Section 152(1)(b) of the Constitution. According to Steytler, De Visser and Mettler*Making Law* 26. Sustainable service delivery can be described as the provision of services in such a manner that the consumer can afford the services and the supplier can provide them within its own means and on an on-going basis.
178 Section 152(1)(d) of the Constitution.
179 Section 155(7) of the Constitution.

categories, namely executive and legislative. In terms of a municipality's legislative powers it can make by-laws. In terms of its executive powers it can assert these by-laws and in some cases national legislation as well, and administrate the executive body whilst the other duties are divided between the three spheres of government.[180] The fact that both executive and legislative authority is vested in the municipal council[181]at times seems to be problematic. Checks and balances cannot be instituted because this organ of state would then be supervising its own proceedings.[182] Therefore it is difficult to reach a conclusion as to how "green building" and "green design" could optimally be promoted in local government, because of the fact that both the executive and legislative authority vests in the municipal council making it difficult for the natural rule of *nemo iudex in propria causa* to be applied, for example.[183]

The Constitution stipulates in Schedules 4(B) and 5(B) the matters over which a municipality has legislative and executive powers. The Schedules provide an enunciation of the services the municipality must provide.[184] The mandates include regulating air pollution, building, electricity and gas reticulation, and water and sanitation services (which are limited to potable water supply systems and domestic waste-water and sewage disposal systems).[185] The conclusion that could be reached is that municipalities are responsible for implementing building regulations and energy efficiency, both of which are key areas in the "green building" context.

### *4.3.2 Local Government: Municipal Systems Act 32 of 2000*

The Systems Act is the act that regulates municipalities in South Africa. The following paragraph will discuss the objectives of the act and the relevant provisions that indirectly address the role of municipalities in the promotion of "green building" and "green design".

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180 Bekink *Principles of South African Local Government Law* 214.
181 Section 151(2) of the Constitution.
182 Bekink *Principles of South African Local Government Law* 214.
183 Burns *Administrative Law under the 1996 Constitution* 172.
184 Bekink *Principles of South African Local Government Law* 216.
185 Schedule 4(B) of the Constitution.

#### 4.3.2.1 Objectives of the Act

The objectives of the Systems Act is to seek to provide services to all people of South Africa, but to be fundamentally developmental in orientation where local government failed under apartheid to meet the basic needs of the majority of South Africans.[186] Furthermore to set out core principles, mechanisms and processes that give meaning to developmental local government where there is a need, and to empower municipalities to move towards the social and economic upliftment of communities in specifically the poor and the disadvantaged.[187] The new system of local government requires an efficient, effective and transparent local public administration that conforms to the principles that is set out in the Constitution, and which includes section 24 of the Constitution, the environmental right. A further objective is to ensure financial and economically viable municipalities and to create more harmonious relationships between municipal councils, administrations and local communities. This harmonious relationship can be established through the acknowledgement of mutual rights and duties.[188] Finally, to develop a strong local government system that is capable of exercising the functions and powers that are assigned to it.[189]

#### 4.3.2.2 Relevant provisions in relation to sustainable development

##### 4.3.2.2.1 Rights and duties of municipal councils and administrations

The duties of municipalities are described in section 4 of the Systems Act in which sub-section 2(d) states that municipalities must strive to ensure that municipal services are provided to the local community in a financially and environmentally sustainable manner.[190] It can be argued that municipalities must promote "green building" and "green design" and energy efficiency within the municipal services. In exercising its executive and legislative power the municipality must promote a safe

186 Preamble of the Systems Act.
187 Preamble of the Systems Act.
188 Preamble of the Systems Act.
189 Preamble of the Systems Act.
190 Section 4(2)(d) of the Systems Act.

and healthy environment.[191] In promoting a safe and healthy environment, the municipality are realising the environmental right in section 24 of the Constitution. The final responsibility that finds its application in this study is that the municipality must contribute together with other organs of state to the progressive realisation of the fundamental rights contained in section 24 of the Constitution,[192] which is directly relevant to the need for "green building" and "green design".

Section 4, discussed above, must be read in conjunction with section 6, where the duties of municipal administrations are described. Together with the fact that municipalities are responsible for building regulations, section 6(2)(e) states that municipalities must give members of the local community full and accurate information about the level and standard of municipal services that the community is entitled to receive.[193] This statement has implications for the municipality in connection with "green building" and "green design" and energy efficiency – it may be important for the community to know why and how a municipality is implementing "green building" and "green design" and how it is promoting energy efficiency. This statement is also of importance due to the fact that municipalities may have to inform the local community to what "green building" and "green design" is and how people in the community can promote it locally.

4.3.2.2.2 Adoption of integrated development plans

In the new local governmental dispensation there is a focus on the development of IDPs (integrated development plans), which appear to be a key mechanism in the Systems Act to achieve developmental local government. Integrated development planning is a planning approach that aims at finding the best way to ensure sustainable development in an area. The planning process must be integrated, which means that all social, economic, environmental, spatial, cultural, and political and any other relevant considerations must be taken into account to ensure that the development of a consolidated, strategic, long-term developmental plan will result. The development of an IDP is a method used to ensure that a municipality's

191 Section 4(2)(i) of the Systems Act.
192 Section 4(2)(j) of the Systems Act.
193 Section 6(2)(e) of the Systems Act.

resources will be allocated in a strategic and holistic way. An IDP is sometimes described as local government's short-, medium- and long-term development plan for a specific area.[194]

An IDP that is adopted by a municipal council is a strategic planning instrument that guides and informs all planning and development and also all of the decisions regarding planning, management and development in the municipality. The IDP binds the municipality in exercising its executive authority and also other persons to the extent that those parts of the IDP that impose duties or affect the rights of those persons have been passed as a by-law.[195] The IDP must link, integrate and co-ordinate plans and must take into consideration proposals for the development of the municipal domain. An IDP can therefore in principle be used to foster "green building" and "green design" in the interests of current and future generations by including objectives, strategies and timeframes for the promotion and realisation of "green building" and "green design" in a specific municipality.

Municipalities may impose rates on property, and surcharges on fees for services that are provided by or on behalf of the municipality.[196] The taxation that is applicable to the municipality is called property tax, which requires the owner of the immovable property within the specific jurisdiction of the municipality to pay tax to the specific municipality based on a valuation of the property.[197] According to Bekink, it has been argued that local governments should have some latitude with regard to property taxes in its jurisdiction in a manner that the municipality can reflect its own unique circumstances and local economic objectives.[198] For purposes of this study, it can be argued that should a person or company promote "green building" and "green design" on its immovable property, the municipality should assist by encouraging these actions through decreasing the property tax on the specific immovable property.

194 Bouillon "*Volhoubare Grondontwikkeling"* 93.
195 Section 25 of the Systems Act.
196 Section 229 of the Constitution.
197 Bekink *Local Government Law* 432.
198 Bekink *Local Government Law* 433.

4.3.2.2.3 Legislative authority of municipalities

The legislative authority of the municipality is vested in the council of the municipality and the municipality may exercise its legislative authority within its boundaries.[199] The municipality exercises its legislative authority by passing by-laws[200] and taking decisions in promoting *inter alia* a safe and healthy environment.[201] The Constitution and the Systems Act give municipalities the power to draft and make by-laws that relates to a safe and healthy environment.[202] Nothing precludes a municipality from drafting a by-law on compulsory local standards towards "green building" in the area. In fact, a by-law would be the only legal instrument at the disposal of a municipality to *enforce* requirements (compulsory requirements) in relation to energy efficiency and "green building" and "green design".

4.3.2.3 Implications of the Act in relation to "green building" and "green design" at the local level

The Systems Act is an "enabling framework", and even though it does not make direct reference to "green building" and "green design", municipalities have the authority to make reference to the principle of "green building" and "green design" in their respective IDP's and by-laws or in die promulgation of by-laws, and also in other relevant projects and manuals, for example.

### *4.3.3 National Environmental Management Act 107 of 1998 (NEMA)*

As stated above, municipalities could implement several measures in response to "green building" and "green design". The following section reviews South-Africa`s environmental legislative and policy framework with specific reference to the potential role and function of local government in matters relating to "green building" and"green design".

199 Section 11(1) and (2) of the Systems Act.
200 Section 11(3)(m) of the Systems Act.
201 Section 11(3)(l) of the Systems Act.
202 Section 11(3)(e) of the Systems Act.

#### 4.3.3.1 Objectives of the Act

The objectives of NEMA are to provide for an environment that is not harmful to the health and well-being of South Africa's inhabitants and to develop a framework for the integration of good environmental management into all developmental activities.[203] NEMA aims to promote certainty in decision-making by organs of state on matters that are concerned with the environment, and establishes principles that guide the exercising of the functions that affects the environment.[204] NEMA aims also to establish procedures and institutions to facilitate and promote co-operative government, intergovernmental relations and public participation in environmental governance. The State should enforce NEMA and should also facilitate the enforcement of environmental laws by civil society.[205] SANS 10400-XA and building regulations should also be enforced, because when it is enforced a sustainable environment arguably will be promoted.

#### 4.3.3.2 Relevant provisions in relation to sustainable development and local government

##### 4.3.3.2.1 Principles of NEMA

The NEMA provides a broad spectrum of basic environmental management principles that applies across South Africa and in different sectors. Municipalities are bound to NEMA and must adhere to the principles therein. Section 2 of NEMA places a direct duty on the State, (including municipalities) to respect, protect, promote and fulfil the social and economic rights in the Bill of Rights.[206] Each of the principles that may have a bearing on "green building" and "green design" are briefly discussed below.

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203 Preamble of NEMA.
204 Preamble of NEMA.
205 Preamble of NEMA.
206 Section 2(1)(a) of NEMA.

- Ecosystems and biological diversity

The disturbance of the ecosystem and the loss of biological diversity must be avoided or minimised.[207] As part of protecting ecosystems and biodiversity, "green buildings" could be used to reduce overall environmental impact, ecosystem disturbance and environmental harm, generally. "Green building" and "green design" will be promoted since before the erection of a building, the ecosystem and the natural biodiversity of the specific premises will be researched and if there is disturbance to the biodiversity of an ecosystem, the project must be reconsidered.

- Pollution and degradation of the environment

Pollution and the degradation of the environment must be avoided altogether and if not avoided, be minimised.[208]Pollution causes harm to the environment. Therefore, if pollution and the degradation of the environment are avoided through "green building" and "green design", this principle would at least be promoted in the built environment. As discussed, one of the objectives of "green building" and "green design" is water efficiency,[209] for example, if water is less polluted as part of "green building" and "green design", this NEMA principle will be promoted in relation to water and specifically, in the built environment.

- Landscapes and the sites that constitute the nation's cultural heritage

This principle promotes the protection and enhancement of heritage and that the disturbance of landscapes and sites that constitutes the nation's cultural heritage must be avoided.[210] This relates also to reducing environmental impact. One of the objectives of "green building" and "green design" is design efficiency.[211] If developments in the built environment are designed to ensure that it does not disturb landscapes or cultural heritage and promotes the protection of heritage, as part of a "green building" effect, this NEMA principle would be promoted.

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207 Section 2(4)(a)(i) of NEMA.
208 Section 2(4)(a)(ii) of NEMA.
209 See 2.1.3.
210 Section 2(4)(a)(iii) of NEMA.
211 See 2.1.3.

- Waste

A further objective of "green building" and "green design" is waste reduction,[212] and one of the principles is that waste that is generated must be avoided and if not avoided, be minimised and re-used or recycled or disposed of in a responsible manner.[213] This objective and principle go hand in hand with each other and therefore "green building" and "green design" could in principle promote and result in waste minimisation or waste reduction.

- Risk-averse and cautious approach

The risk-averse and cautious approach is applied, taking into account current knowledge when anticipating to build a "green building". This means that a developer should take into account the limits of natural resources, and also the current knowledge and consequences of the decisions and action taken.[214] Due to the limited scope of knowledge in some areas of development, including in relation to air emissions, water and waste and its impact (long term) on human health, an energy efficient "green building" would be complementary to this NEMA principle.

- Negative impacts on the environment and people's environmental right

Negative impacts on the environment and on people's environmental rights need to be anticipated and prevented, and where they cannot be altogether prevented need to be minimised and remedied.[215] However, it is possible that when new buildings are being erected now or in the future, they could be developed in a more sustainable and energy-efficient way. Older buildings can systematically be changed into sustainable, energy-efficient buildings by replacing some of the old materials used in their construction with new, energy-saving materials. "Green buildings" and "green design" have a positive impact on the environment and local communities. Per definition, a "green building" aims to minimise the impact of development (such as building a block of flats) on the environment in the short and long term. As such,

212 See 2.1.3.
213 Section 2(4)(a)(iv) of NEMA.
214 Section 2(4)(a)(vii) of NEMA.
215 Section 2(4)(a)(viii) of NEMA.

"green buildings" potentially limits overall environmental impact as envisioned by this NEMA principle.

During the entire building life cycle, responsibility for the environmental health and safety consequences of a policy, project, product, process, service or activity that exist must also be taken into account.[216] This implies that if building is sustainable approached from the design to the destruction phases of the total development, as is often the case with "green building", this NEMA principle will be adhered to.

#### 4.3.3.3 The duty of care

Section 28 of the NEMA states that where a person causes, has caused or may cause significant pollution or degradation of the environment, such a person must take reasonable measures to prevent such pollution or degradation (hereafter "harm") from occurring, continuing or recurring. If the harm is authorised by law or cannot reasonably be avoided or stopped, the harm to the environment must be minimised and rectified.[217]

This provision could be broadly interpreted as to suggest that the built environment must be developed in a way that would minimise pollution and environmental harm – including unnecessary loss of scarce natural resources such as water and energy sources.

##### 4.3.3.3.1 Integrated environmental management

NEMA makes provision for integrated environmental management by requiring that an environmental impact assessment (hereafter an EIA) be done in order to determine the impact of an activity on the environment.[218] This requirement is sometimes perceived as mere semantics and therefore disregarded. Environmental assessment in the broader sense encapsulates the assessment terminology and includes EIA and strategic environmental assessments (hereafter SEA). It has been

216 Section 2(4)(e) of NEMA.
217 Section 28(1) of NEMA.
218 Section 24 of NEMA.

argued that an environmental assessment is not a decision-making tool but rather a tool that aids decision-making and provides information to decision makers.[219] South African legislation defines an EIA as including the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.[220] When a building is proposed to be erected, an EIA should normally be done to see what the impact of this specific building will be on the environment. If the impact of a building on the environment indeed claims to be negative, "greener" methods of building can be attempted in order to minimise the environmental impact. This tool could also eventually be used to make "green building" and "green design" more compulsory in South Africa.

In GN R543 in GG 33306 of 18 June 2010 the Minister listed the activities (which include the construction of facilities or infrastructure) that need a basic assessment[221] or an EIA and scoping.[222] The construction of an infrastructure where energy is generated[223] and a development that is associated with structures and infrastructure where development is intended to be 20 hectares or more need scoping and a full EIA, for example.[224] The competent authority in the case of a basic assessment is the environmental authority in the province. However, if the activity is contemplated in section 24C(2) of NEMA, the competent authority is the Minister or an organ of state.[225] Municipalities have the duty to regulate the basic assessment in a specific province if this power has been delegated to them by the Minister. EIAs can potentially serve as an effective tool for promoting the incorporation of "green building" and "green design" in decisions on development that may affect the environment. Local governments should be involved in EIA processes, as they should ensure (due to the principle of subsidiarity)[226] that all developments proposed correspond with their IDPs. It is therefore suggested that "green building" and "green design" should be included as objectives in municipal

219 Kidd and Retief "Environmental Assessment" 971-1047.
220 Kidd and Retief "Environmental Assessment" 971-1047.
221 GN R544 in GG 33306 of 18 June 2010.
222 GN R545 in GG 33306 of 18 June 2010.
223 No 1(a) of GN R545 in GG 33306 of 18 June 2010.
224 No 2 of GN R545 in GG 33306 of 18 June 2010.
225 Kidd and Retief "Environmental Assessment" 971-1047.
226 Discussed in 4.3.2.2.2.

IDPs to guide municipal authorities in approving or disapproving of proposed developments that are not in line with their IDPs.

#### 4.3.3.4 Implications of the Act in relation to "green building" and "green design" at the local level

As seen above, municipalities have a direct duty in fulfilling the principles listed in NEMA. It was shown how "green building" and "green design" could be aligned with and complement several of the environmental management principles and how it could be directly relevant to achieving the objectives of the act. In the author's opinion, the most relevant of the principles arguably is the following; (a) waste minimisation; (b) a risk-averse and cautious approach and (c) the duty of care. It does not, however, seem necessary or possible to hierarchically categorise the principles. Ultimately, "green building" should be aimed at promoting all of the NEMA principles.

### *4.3.4 White Policies relevant to "green design" and "green building"*

#### 4.3.4.1 Introduction

Several national policy papers (White Papers) appear to be of relevance in determining the role of local government in promoting "green building" and "green design" in South Africa. These White Papers are briefly discussed below.

#### 4.3.4.2 White Paper on Local Government, 1998

The White Paper on Local Government states that a local government is responsible for the provision of household infrastructure and services, the creation of liveable, integrated cities, towns and rural areas. Local governments are also responsible and have a developmental outcome to develop the local economy as well as community empowerment and redistribution. Local government is responsible to provide household infrastructure and services which is essential components of social and

economic development.[227] This directly links to sustainable development[228] of which social and economic development are two of the three categories. This White Paper further states that services to residential areas and businesses are provided on a sustainable basis by municipalities.[229] As stated above[230] a direct link can be drawn between "green building" and "green design" and sustainable development, therefore it can be argued that "green building" and "green design" are also forming part of the obligation on municipalities to be more developmental. Municipalities, according to the White Paper, can do integrated development planning, budgeting and performance monitoring[231] in order to fulfil the component of developmental and sustainability, generally.

#### 4.3.4.3 White Paper on the Energy Policy of the Republic of South Africa, 1998

The *White Paper on the Energy Policy of the Republic of South Africa,* 1998 is one of South Africa's initiatives to strive towards sustainability. The objective of this White Paper is to integrate various energy-related policy processes and to provide policy stability for energy suppliers, investors and consumers. The White Paper seems to put pressure on the South African government to take greater cognisance of the impact of its decisions and activities on the environment. It aims to fulfil the objective of the national energy policy of making clean, affordable and appropriate energy available to all sectors of the population. Importantly, the White Paper also commits itself to a "no regrets"[232] approach in the energy sector in an attempt to address the potential global environmental impacts of South Africa's energy activities.[233] One of the objectives of "green building" and "green design" is energy efficiency, and if this objective is to be promoted, the objectives of the national energy policy and the objectives of this White Paper could be achieved.

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227 *White Paper on Local Government*, 1998.
228 See 2.1.2.
229 *White Paper on Local Government,* 1998.
230 See par 2.1.3.
231 *White Paper on Local Government,* 1998.
232 *White Paper on the Energy Policy of the Republic of South Africa,* 1998. The phrase "no regrets" is defined as that which decreases and minimises environmental impacts commensurate with cost effectiveness and a positive cash flow.
233 Kidd *Environmental Law* 311.

#### 4.3.4.4 White Paper on the Renewable Energy Policy for the Republic of South Africa, 2003

A further initiative of the national government is the *White Paper on the Renewable Energy Policy for the Republic of South Africa,* 2003. This White Paper[234]is a development based on the *White Paper on Energy Policy,* 1998 discussed above. The White Paper of 2003 has the goal of diversifying energy supply by developing advanced, cleaner, more efficient, affordable and cost effective energy technologies. These energy technologies include fossil fuel technologies and renewable energy technologies.[235] The White Paper sets out the government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy, such as cleaner alternatives to coal that currently powers the nation.[236] The main objective of this White Paper is to increase the contribution of renewable energy to the energy mix, which will then contribute to sustainable development and environmental conservation.[237] Four strategic areas that are vital to the creation of an environment for the promotion of renewable energy have been identified, namely: (1) financial and legal instruments; (2) technology development; (3) capacity-building; and (4) education. In so far as "green building" and "green design" often aim to make use of alternative energy such as solar energy. It seems as if it could in principle contribute to the objectives if the national policy.[238]

#### 4.3.4.5 White Paper on the National Climate Change Response, 2011

The *White Paper on the National Climate Change Response,* 2011[239] commits South Africa to making a fair contribution to the stabilisation of global GHG concentrations in the atmosphere and the protection of the country and its people from the impacts of unavoidable climate change. The second objective to which South Africa is

234 *White Paper on the Renewable Energy Policy for the Republic of South Africa,* 2003.
235 Department of Minerals and Energy *White Paper on the Renewable Energy Policy of the Republic of South Africa.* The document can also be found at http://www.info.gov.za/view/DynamicAction?pageid=549&tabfield=kcYYYY&tabval=1998&sdate=&orderby=document_date_orig%20desc.
236 Rumsey and King "Climate Change: Impacts, Adaptation, and Mitigation; threats and opportunities" 1048-1077.
237 Kidd *Environmental Law* 312.
238 Rumsey and King "Climate Change: Impacts, Adaptation, and Mitigation; threats and opportunities" 1048-1077.
239 GN 757 in GG 34695 of 19 October 2011.

committed is to effectively manage the inevitable impacts of climate change on the environment through interventions that build and sustain social, economic and environmental resilience and emergency response capacity.[240] The White Paper presents the government's vision for an effective climate change response and the long-term transition to a climate-resilient and low-carbon economy and society. However, South-Africa's emissions will continue to rise as the government seeks to expand the economy and basic services are provided to more people. Efforts must therefore be made to develop in an environmentally friendly way.[241] The vision of the White Paper is premised on the government's commitment to sustainable development and a better life for all, because climate change is considered to one of the greatest threats to sustainable development.[242]

The White Paper makes reference to the Renewable Energy Flagship Programme and also the Energy Efficiency and Energy Demand Management Flagship Programme.[243] The Renewable Energy Flagship Programme involves the South African Renewable initiative that is led by the Department of Public Enterprises and the Department of Trade and Industry as drivers to enhance the domestic manufacturing potential and the implementation of energy efficiency and renewable energy plans by local government.[244] The Energy Efficiency and Energy Demand Management Flagship Programme is a programme developed to support and facilitate energy efficiency in industry and building and also covers non-electricity energy efficiency. The Department of Public Works has an initiative that initiates energy and emissions audits on all government buildings that will be developed.[245] These programs which have been developed, subtly promote "green building" and "green design" since energy efficiency is one of the objectives[246] of "green building" and "green design".

240 GN 757 in GG 34695 of 19 October 2011.
241 Rumsey and King "Climate Change: Impacts, Adaptation, and Mitigation; threats and opportunities" 1048-1077.
242 GN 757 in GG 34695 of 19 October 2011 at the Introduction.
243 GN 757 in GG 34695 of 19 October 2011.
244 GN 757 in GG 34695 of 19 October 2011.
245 GN 757 in GG 34695 of 19 October 2011.
246 See para 2.1.3.

The White Paper explains also the mitigation potential for climate change. It is stated that the majority of emissions that arise in South Africa are coming from energy supply (electricity and liquid fuels), and use (mining, industry and transport). Opportunities arise for the mitigation of emissions. These opportunities consist of energy efficiency (which is also one of the objectives of "green building" and "green design") demand management and to move to a less emission-intensive energy mix.[247] The White Paper have medium-term mitigation options which include the application of energy efficiency and especially industrial energy efficiency and energy efficiency in public, commercial and residential building and in transport.[248] The conclusion that can be drawn is that "green building" and "green design" plays an important role in mitigation measures for climate change and that it is well-provided for in the latest climate change policies of South Africa.

#### 4.3.4.6 Concluding observations

It was shown above that the South African environmental framework and local government legislation and policies contain several duties that can be best be managed by the local government sphere. The next paragraph will consider two municipalities in the Western Cape and investigate in what ways these two municipalities have to date started to address and provide for "green building" and "green design".

# 5 *Status quo* at the local level: *capita selecta*

## *5.1 Introduction*

In the section to follow attention is paid to the initiatives towards "green building" and "green design" in two Western Cape municipalities of different capacity. Specific attention is paid to the *Problem Building By-law*, 2010and the Kuyasa Clean Development Mechanism (CDM) Project[249] of the City of Cape Town and the *Green Building Manual*, 2010of Drakenstein Municipality. The main objective is to show

247 GN 757 in GG 34695 of 19 October 2011.
248 GN 757 in GG 34695 of 19 October 2011.
249 For more information regarding the Kuyasa CDM Project visit http://www.kuyasacdm.co.za.

how municipalities could use the enabling framework created by the Constitution and framework laws to compel and motivate developers towards undertaking "green building" and "green design" at the local level.

These municipalities are not representative of the entire country and have been selected on the bases of information that is readily available for purposes of a desktop review.

## *5.2 City of Cape Town*

### *5.2.1 Introduction*

The City of Cape Town (hereafter Cape Town), is a metropolitan municipality based in the Western Cape Province and the population is estimated to be 3.5 million people.[250] Cape Town recognises the importance of limited natural resources and is committed to partnering up with stakeholders to research and develop more efficient, or alternative fuel and energy sources.[251] By doing so, Cape Town ensures that sufficient energy for the city and its residents is provided and limits the impact of energy consumption on the environment.[252]

Cape Town has certain challenges and opportunities that confront the City's government and management structures. One challenge that Cape Town faces is dealing with solid waste in the future, since its landfill capacity is not sufficient for the likely increase in waste. This challenge requires interventions and programmes that are intended to deal with, for example, landfill/dump rehabilitation and new landfill sites.[253] Energy is derived from a number of sources, for example, electricity is generated through the burning of coal, with smaller proportions derived from nuclear and renewable sources. Transport derives from liquid fuels (petrol and diesel) and paraffin is used for household cooking and lighting needs. This challenge is address by reduced electricity consumption targets that are being included in an energy plan

250 The City of Cape Town's IDP 2011 4 http://www.capetown.gov.za.
251 The City of Cape Town's IDP 2011 3 http://www.capetown.gov.za.
252 The City of Cape Town's IDP 2011 3 http://www.capetown.gov.za.
253 The City of Cape Town's IDP 2011 20 http://www.capetown.gov.za.

for Cape Town.[254] Therefore it can be seen that Cape Town acknowledges the challenges, and by acknowledging it, already start to address it which is of great advancement of "green design" and "green building."

Cape Town's spatial development framework has developed long-term strategies for the development and growth of the metropolitan. One of these strategies is that the natural resources and green spaces are defined, protected, enhanced and made more accessible. For sustainability reasons these natural resources depend on the protection and enhancement of the natural ecosystem.[255]

The IDP of Cape Town has focus areas that aim to conserve natural resources which directly promote "green building" and "green design". An objective is to reduce the water demand. Cape Town is embarking on the water leaks repair programme, pressure management, roll-out of water management devices, treated effluent reuse programme and education and awareness programmes in order to promote this objective.[256] This programme promotes "green building" and "green design", because it assists in the mitigation objectives of protecting scares natural resources.[257] Cape Town is finalising an Energy-efficient Water Heating By-Law which will mandate energy efficient water heating and new buildings and renovations. Cape Town is also exploring to develop a Green Building By-Law that will develop more resource-efficient built environment and emphasis will be placed on energy efficiency.[258]

The following paragraph will address the *Problem Building By-Law* and the Kuyasa Energy Efficiency Project as existing and related initiatives of the City of Cape Town.

254 The City of Cape Town's IDP 2011 24 http://www.capetown.gov.za.
255 The City of Cape Town's IDP 34 2011 http://www.capetown.gov.za.
256 The City of Cape Town's IDP 61 2011 http://www.capetown.gov.za.
257 See paragraph 2.2.2.
258 The City of Cape Town's IDP 70 2011 http://www.capetown.gov.za.

### *5.2.2 "Green building" and "green design" related initiatives in the municipality*

#### 5.2.2.1 Problem Building By-Law

The City of Cape Town promulgated its *Problem Building By-law* on the 9th of July 2010. Cape Town aims to identify, control and manage dilapidated and problem buildings within its area through ensuring that applicable buildings comply with the *Problem Building By-law*. Cape Town implements this by-law by means of a coordinated, integrated strategy plan, process and procedures that turn problem buildings around. This turnaround of buildings can be through rejuvenating or regenerating buildings rather than demolishing them, or where problem buildings cannot be rejuvenated or regenerated, to redevelop the property after consultation with the owners. This facilitates the disposal of problem buildings for the purpose of achieving the objectives set out in the *City of Cape Town Problem Building By-Law,* 2010.[259]

No direct reference to sustainable building practices or to the health of people is made in the by-law, but the following can be argued: the City promotes "green building" and "green design" by means of this by-law since most aspects touched on, support sustainability. The question that arises is when a building[260] can be classified as a problem building. A problem building includes any building or portion of a building that appears to have been abandoned by the owner with or without the consequence that rates or other service charges are not being paid.[261] Or a problem building can be a building or a portion of a building that is derelict in appearance, overcrowded, or is showing signs of becoming unhealthy, unsanitary, unsightly or objectionable, or that it is the subject of written complaints in respect of criminal

259 The preamble of the *City of Cape Town Problem Building By-Law*, 2010.

260 Section 1 of the *City of Cape Town Problem Building By-Law*, 2010. A "building" can be defined as any structure, whether of a temporary or permanent nature and irrespective of the materials used in the erection thereof, erected or used for or in connection with the – accommodation or convenience of human beings or animals; manufacture, processing, storage, display or sale of goods; rendering of any service; destruction or treatment of refuse or other waste materials; cultivation or growing of any plant or crop; any wall or part of a building; a unit or common property as defined in the *Sectional Titles Act*, 1986 (Act No 95 of 1986); or any vacant or unoccupied erf.

261 Section 1 of the *City of Cape Town Problem Building By-Law*, 2010.

activities taking place within it, including drug dealings and prostitution.[262] A problem building can also be classified as a building that is illegally occupied, where refuse or waste material is accumulated, dumped, stored or deposited, with the exception of licensed waste disposal facilities, or a building or a portion of a building that is partially completed or structurally unsound and is a threat or danger to the safety of the general public.[263]

If a person contravenes any provision or fails to comply with a notice issued in terms of the *Problem Building By-law* the person commits an offence.[264] This person is liable to a fine that does not exceed R300 000 or imprisonment for a period that does not exceed three years or both a fine and imprisonment. If the person continues to fail to comply with the provisions in terms of the *Problem Building By-law*, an additional fine or imprisonment that does not exceed 10 days for each day on which such an offence continues, may be imposed on that person. In addition to any penalty imposed in terms of the above, a person that is convicted shall be held liable to pay the cost of repair of any damage caused or cost incurred in remedying any damages resulting from such an offence.[265]The author is of the opinion that the City should consider including more references to specifically environmental or sustainability issues in applying this by-law. If a building causes harm to the environment and keeps on causing harm to the environment, the same conviction must arguably be placed upon the person[266] who caused the offence.[267]

#### 5.2.2.2 Kuyasa Energy Efficiency Project

A further example of how Cape Town is promoting "green building" and "green design" is with the Kuyasa Energy Efficiency project (hereafter Kuyasa) which is South Africa's first registered Clean Development Mechanism (CDM). Kuyasa aims

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262 Section 1 of the *City of Cape Town Problem Building By-Law*, 2010.
263 Section 1 of the *City of Cape Town Problem Building By-Law*, 2010.
264 Section 10 of the *City of Cape Town Problem Building By-Law*, 2010.
265 Section 10 of the *City of Cape Town Problem Building By-Law*, 2010.
266 Section 28(2) of NEMA. Without limiting the generality of the duty in s 28(1), the person on whom subsection (1) imposes an obligation to take reasonable measures, include an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises on which or in which – (a) any activity or process is or was performed or undertaken; or (b) any other situation exists, which causes, has caused or is likely to cause significant pollution or degradation of the environment.
267 See 3.3.2.

to retrofit existing low-income houses with solar water heaters that will provide hot water; insulated ceilings that will improve thermal efficiency and fluorescent light bulbs which will provide the house with energy efficient lighting.[268] This project helps in saving electricity consumption that will result in emission reduction of 2.85 tons of $CO_2$ per household, per year.[269]Kuyasa contributes to distribution of efficient and renewable energy technologies and socio-economic developments. Affordable and clean energy services will be established by energy security in reducing the pressure on the economy and natural resources.[270] It can be seen that this project directly promotes sustainability and indirectly the objectives of "green building" and "green design" as discussed earlier.[271]

#### 5.2.2.3 Lessons for other municipalities in South Africa

Although Cape Town does not have a by-law that is directly applicable to "green building" and "green design" the *Problem Building By-Law*, 2010 can promote "green building" and "green design". Another important factor that must be kept in mind is that a by-law is enforceable, and all citizens within Cape Town jurisdiction must adhere to this by-law when building a home, or renovating the home. Other municipalities can therefore adopt/adjust (to include the environment) and implement this by-law. All municipalities (including Cape Town) can further the objective of this by-law to include "green building" and "green design". Municipalities can use their legislative power, additional in making IDPs and programs as seen above to achieve sustainability objectives, also via "green building" and "green design".

268 City of Cape Town 2007 http://www.capetown.gov.za/en/EnvironmentalResourceManagement/projects/ClimateChange/Pages/KuyasaEnergyEfficiencyProject.aspx.

269 City of Cape Town 2007 http://www.capetown.gov.za/en/EnvironmentalResourceManagement/projects/ClimateChange/Pages/KuyasaEnergyEfficiencyProject.aspx.

270 City of Cape Town 2007 http://www.capetown.gov.za/en/EnvironmentalResourceManagement/projects/ClimateChange/Pages/KuyasaEnergyEfficiencyProject.aspx.

271 See par 2.1.3.

## *5.3 Drakenstein Municipality*

### *5.2.1 Introduction*

Drakenstein has a population of approximately 200 000 citizens and is situated in Paarl, in the Western Cape and covers an area of approximately 1 538 km².[272] The challenges that exist in Drakenstein are that the urban and new developments are unsustainable. Because of poor land use management practices, unsustainable resource utilisation and general environmental decay, the natural environment is under threat because of the on-going loss of biological diversity and decay of essential ecological systems.[273] Drakenstein's IDP does not address or make provision for "green building" or "green design", but the municipality have a progressive *Green Building Manual,* discussed hereafter.

5.3.2 "Green building" and "green design" related initiatives encouraged by the municipality

5.3.2.1 Green Building Manual

Drakenstein Municipality has a *Green Building Manual* that commits the municipality to energy efficiency. This manual informs and creates awareness among the local community of the available options to reduce the consumption of energy and other resources when constructing a new building, or making additions to existing buildings and/or initiating new developments within the Drakenstein municipal area.[274]

The manual provides guidelines to reduce energy consumption and the consumption of other resources during different building phases and within the building life cycle. When a building is demolished the old building materials will be recycled, for example. The simple interventions proposed in the manual have the potential to

272 Drakenstein Municipality 2011 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.
273 Drakenstein Municipality 2011 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.
274 Drakenstein Municipality 2011 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

contribute to sustainability and also to lower electricity and water bills. They could also reduce the need for and cost of building maintenance and improve the overall health of those who inhabit the building.[275] The *Green Building Manual* includes "guidelines in relation to every building phase" as will be discussed below.

The guidelines provide that in the site selection phase, greyfield[276] and brownfield[277] sites should be considered for redevelopment before greenfield[278] sites are developed. After development has been undertaken on the sites, rehabilitation needs to be done on degraded sites that will reduce any negative environmental and health impacts. Dense urban development should be supported to reduce urban sprawl, to make use of efficient infrastructure, and to access amenities. The guidelines provide that when developing a new site or building, the availability of public transport should be considered in order to reduce energy consumption patterns.[279] The upgrading of existing buildings would also contribute to the effectiveness of the town's infrastructure according to this guideline, as the existing systems would be used more intensively and additional new service infrastructure would be avoided.[280]

The design phase includes the effective placement of buildings on a specific site. This could optimise natural features and open spaces. The positioning of a building in a certain position on a site that will be developed can enhance the natural functioning of a larger ecological network and contribute to creating a more inhabitable urban environment. Buildings should be placed in such a way as to maximise the use of natural resources for lighting and ventilation, by using natural light and ventilation instead of air conditioning, for example. The size of a building

275 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

276 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.Greyfield sites are sites that have been previously developed with at least 50 percent of the surface area covered with impervious material.

277 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx. Brownfield sites are sites the expansion, redevelopment, or re-use of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant.

278 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx. Greenfield sites are virgin sites that have not been developed or affected by any development.

279 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

280 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

must also be considered when developed, in a way that the building will be most energy efficient. Wasted spaces should be avoided since these spaces create wasted building materials and energy.[281]

During the construction phase a developer may use natural materials such as adobe, sand bags or hay bales. Another way to save energy according to the manual is to use sun-dried or cement-stabilised earth bricks as an alternative to conventional clay or cement bricks. These materials save energy because they are not fired, and they also have excellent thermal mass. Materials that are in generous amounts and that have been locally produced must be used, as well as materials from renewable resources. The aim of using such materials is to avoid exhausting the supply of materials and also to avoid the unnecessary transportation of the materials.[282] Materials that require less processing and are manufactured closer to the construction site are more sustainable and use embodied energy.[283]

The guideline further provides that pitched roofs should be considered as it ensures greater run-off and also requires less water-proofing. Dormer windows, skylights and roof lights are encouraged as the insulation in the roofs and walls will keep the temperature inside the house warm in the winter and cool in the summer. Ceilings that are properly insulated must be installed. These ceilings are the most cost-effective energy efficiency measure as most heat is gained and lost through the roof. Doors and windows must be properly fitted and sealed and there should be no cracks in the construction due to the fact that they would allow unwanted airflows in and out of the building. Recycled and re-used wood can be used for doors, door frames, tables, counter tops and cupboards in the building.[284]

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281 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

282 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx. "Embodied energy" is the energy that was used in the process of manufacturing and transporting the materials all along the production and retail chain, before being used in the building.

283 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

284 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

Energy efficient electrical installations should also be used in the building. The guideline proposes that energy efficient electrical installations can be ensured by installing newer equipment, as the newer equipment is often more energy-efficient that older equipment.[285]

Another way in which the municipality promotes "green building" and "green design" in the manual is by promoting the use of artificial lighting. Controls such as dimmers and motion sensors reduce energy consumption while ensuring that there is light when it is needed. The use of energy-efficient light bulbs can substantially reduce energy costs. Incandescent light bulbs can be replaced with fluorescent lamps (CFLs) or LED bulbs. Both the CFLs and LED lights use much less energy than other lights and also last much longer. Energy efficiency can also be promoted by switching off lights when they are not needed in the specific area.[286]

Solar water heating is encouraged. Solar water heaters are roof-mounted water panels that operate by heating water in black pipes using solar power. According to the guideline, water-saving showerheads should be fitted to reduce the amount of water used during showering. However, these showerheads work efficiently only with a balanced pressure geyser. Geyser blankets and pipe insulation can be wrapped around geysers and hot water pipes. Indoor taps should be fitted with aerators.[287] Flush toilets must have cisterns fitted with dual-flush or multi-flush mechanisms.[288]

When it gets to the layout of gardens, the guideline provides that indigenous plants suited to the Western Cape can be used and groups of plants that have similar water requirements can be planted together to avoid over-watering. Irrigation systems such

285 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx. Solar panels, also known as photovoltaic systems, make use of the sun's energy. They convert sunlight into electricity, which is then stored in batteries or cells. The more light the batteries or cells receive, the more electricity can be generated.

286 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx. Also see Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data/uploads/news /docs/85_doc.pdf.

287 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx. "Aerators" are simple devices that can be fitted onto most standard household taps to increase their efficiency while reducing the flow and amount of water used.

288 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx. Also see Green Building Council of South Africa 2011 http://www.gbcsa.org.za/system/data/uploads/news /docs/85_doc.pdf.

as bubblers and drip irrigation can be used in order to reduce water that is lost by evaporation. Community members are encouraged to plant trees. Trees sequester $CO_2$ emissions and thus minimise the effects of global warming. Trees also have other beneficial effects such as cooling homes, improving mental health, increasing property values, reduce urban runoff, capture dust particles from the air and reduce noise pollution.[289]

In the demolition phase, construction and demolition waste should be taken to a crushing facility so that it can be recycled into crushed aggregate. This crushed aggregate is then used as the main ingredient in the manufacturing of a type of concrete plaster brick. Doors, windows frames, roof trusses and other products that could possibly be reused or recycled should be extracted before demolition occurs.[290]

#### 5.3.2.2 Lessons for other municipalities in South Africa

Drakenstein Municipality only has a manual to *promote* "green building" and "green design". Yet, it is a step in the right direction as a product of the executive authority of the municipality. A preliminary proposal is for the manual's content to be captured in an enforceable by-law to make its implementation compulsory. It must also be noted that the manual makes provision for a phased implementation of "green building" to assist a developer. An example of this phased implementation is when an opportunity to build "green" is missed in the foundation , a further opportunity can be exploited when the roof is erected, thus still achieving the objectives of "green building".

## *5.4 Conclusion*

The evaluation above has shown that the City of Cape Town and Drakenstein Municipality indeed explicitly and implicitly attempt to address certain aspects of the phenomenon of energy efficiency, especially in the context of "green building" and

289 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

290 Drakenstein Municipality 2010 http://www.drakenstein.gov.za/Pages/Drakenstein%20Home.aspx.

"green design". It must also be noted that similar developments have also been undertaken by eThekwini Municipality,[291] Ekurhuleni Metropolitan Municipality,[292] Nelson Mandela Bay Metropolitan Municipality,[293] and the City of Tshwane,[294] and all such developments should be applauded.

Based on the entire discussion thus far, in the following paragraph recommendations will be made as to how South African municipalities, generally should promote energy efficiency and specifically "green building" and "green design".

## 6 Conclusion and recommendations

This study departed from the understanding that building regulations can play a positive role in providing an environment that is not harmful to people's health or well-being and it has the potential to contribute to sustainability in the local government context. The discussion commenced with an analysis of the notion of "green building" and "green design".[295] It highlighted areas where "green building" and "green design" can be achieved, and also the positive effect that "green building" and "green design" could have on the built and broader environment with reference to the need for sustainability.[296]

The study next assessed the NRBS *inter alia* in order to identify some of South Africa's municipalities' duties.[297] The duties that local governments have in its constitutionally functional areas of relevance to "green building" and "green design" were explored, as well as the responsibilities they have in terms of building regulations and building standards. It was found that local government has several responsibilities and obligations that are broadly considered to include the approval of

291 eThekwini Municipality developed "green guidelines". Also see http://www.durban.gov.za.
292 Ekurhuleni Metropolitan Municipality developed a campaign "Promotion of energy efficiency in Buildings". Also see http://www.ekurhuleni.gov.za.
293 The Nelson Mandela Bay Metropolitan Municipality promotes a "Go Green Campaign". Also see http://nelsonmandelabay.gov.za.
294 The City of Tshwane develop a "Green Building Policy". Also see http://www.cityoftshwane.gov.za.
295 See par 2.
296 See par 2.4.
297 See par 4.

building plans before building may proceed.[298] It was shown that the promotion of "green building" and "green design" has already commenced in certain municipalities.[299]

It was further found that South Africa's government (all three spheres) is now enforcing regulation GG R711 no 34586 of 9 September 2011 to promote efficiency in energy usage in buildings.

The legal framework that governs local government was analysed to determine the role it plays in the country's attempt to achieve "green building".[300] It was shown that local authorities have various objectives, duties and functions designed to *inter alia* promote "green building" and "green design".[301] Local governments have certain executive and legislative powers derived from the Constitution and the Systems Act which enable them to reach, in particular, the objectives set out in section 24 of the Constitution.[302]

Integrated development planning as provided for in the Systems Act was also discussed as a way to integrate "green building" in a municipality`s planning.[303] NEMA was considered in order to determine whether or not "green building" and "green design" promotes the principles of NEMA.[304] It was found that NEMA contains several environmental management principles that regulate "green building" and "green design" as well as on sustainability.[305]

Finally it was shown that at least two municipalities in the Western Cape use their power to administer matters listed in Schedules 4(B) and 5(B) and to make by-laws. The City of Cape Town has promulgated a *Problem Building By-Law* which has the aim to identify, control and manage dilapidated and problem buildings within its area.[306] The Kuyasa Energy Efficiency project aims to retrofit existing low-income

298 See par 4.3.2.2.
299 See par 5.
300 See par 3.2.
301 See para 1 and 3.2 above.
302 See para 1, 4.3.1 and 4.3.2 above.
303 See par 4.3.2.
304 See par 4.3.3.
305 See par 4.3.3.2.1
306 See par 5.3.1. and 5.2.2.1.

houses with solar water heaters that will provide hot water; insulated ceiling that will improve thermal efficiency and fluorescent light bulbs with will provide houses with energy efficient lighting.[307]Drakenstein Municipality has published a *Green Building Manual* that specifically applies to the jurisdiction of the Drakenstein (Paarl) district. With this manual, the municipality aims to make citizens more aware of energy efficient methods in planning and maintaining a building.[308]

### *6.1 Existing strengths*

A few strengths in the applicable legal framework have been identified, including:

- Municipalities are equipped with executive and legislative powers. These powers can be used to promote "green building" and "green design" by implementing measures such as policy guidelines or by-laws.
- When implementing the *principle of subsidiarity*, the municipality is closer to the people than the national or provincial governments and can therefore implement and promote "green building" and "green design" more effectively.
- Municipal IDPs can be used for the promotion of "green building" and "green design" in its specific jurisdiction. The IDP can be used as a guide in implementing "greener" ways of identifying land for development, design, building, or in promoting "greener" ways of constructing buildings.
- The environmental management principles that are set out in NEMA can provide guidance to local governments regarding the implementation of "green building" and "green design".
- EIAs can be used in order to determine the impact that a proposed building (and the life cycle of the building) would have one the environment, and if the building could be considered to be a "green building" and "green design".
- GG R711 no 34586 of 9 September 2011 and SANS 10400-XA: 2011 are positive steps in the right direction in implementing energy efficiency in buildings and this regulation is binding across South Africa. Therefore all new buildings must meet the requirements of SANS 10400-XA: 2011.

307 See par 5.2.2.2.
308 See par 5.3.2.

### *6.2 Existing weaknesses*

There are also some weak points pertaining to the existing legal framework, including:

- The NRBS is not tracking developments in environmental expectations/demands and/or technology including in the area of "green building" and "green design".
- Building regulations differ in different local areas. When energy efficient measures are implemented in Cape Town, for instance, they will differ from those in other urban areas such as Johannesburg. The consequence of this is that every municipality must develop and promulgate their own by-law to ensure that "green building" and "green design" specifically be promoted in its area of jurisdiction. SANS 10400-XA: 2011 and GG R711 no 3458 of 9 September 2011 can be used as guide when promulgating by-laws, manuals and programmes.
- Implementing a "green building" and "green design" may result in increased costs to the builder and user – however the implementation of the policy may also result in long-term savings, which are not widely promoted. The long term benefits for current and future generations seem not to be well communicated.

The following recommendations are made in order to further promote "green building" and "green design" at the local level:

- All municipalities should consider and elaborate on the strong points above and should attempt to address and remove the identified weak points as mentioned above when drafting by–laws and designing their IDPs, for example.
- Municipalities must familiarise themselves with sustainable materials, and when considering approving building plans, also give advice on how more "green" materials can be used.

- The Sustainable Building Assessment Tool that the GBCSA has developed must be used by contractors and other relevant professionals, including the officials of local governments on all buildings.[309]
- National framework legislation and regulations must be studied in order to enable municipalities to promulgate by-laws regarding energy efficiency, "green building" and "green design" according to the national framework legislation and regulations.
- IDPs can include "green building" and "green design" objectives, and after each year when the IDP is reviewed, municipalities should measure progress (an Energy Audit Programme can be used) against the desired outcome of the objectives. Remedial actions can be implemented in order to meet the objectives of "green building" and "green design".[310]
- The principles of NEMA should also be analysed to determine how these principles can promote "green building" and "green design" when erecting a building.
- EIAs can be used in order to determine the environmental impact that the erection of a building may have. EIAs can also be made mandatory for the erection of all buildings.
- Lessons can be learned from Cape Town[311] and Drakenstein Municipality[312] as to how these two municipalities address through their legislative and executive powers, "green building" and "green design" – including from their programmes which promote the objectives of "green building" and "green design".
- All 283 municipalities may in the near future have to promulgate by-laws relating to energy efficiency, "green building" and "green design" and a sustainable environment. This should compel people to be more aware of the impact of construction in the long and short term and could regulate "green building" and "green design" as part of municipalities' seeking of sustainability.

309 See par 2.2.2.
310 See par 4.3.2.2.2.
311 See par 5.2.
312 See par 5.3.

- Through an intensive and on-going advertising and promotional campaign government should create a national public awareness of the need for and long-term benefits of "green building" and "green design".
- Municipalities should consider the decreasing of property tax to promote "green building" and "green design".[313]

The degradation of the environment is a growing phenomenon and it requires urgent attention. In order to address this phenomenon, local government should *inter alia* take part in the promotion of energy efficiency and more specifically, in "green building" and "green design" initiatives. Local government has a key role to play with regard to building regulations and local level management of the impact of development. This role, as this study suggested, can be optimised through creative use of a municipality's constitutionally entrenched legislative and executive powers. It is hoped that South Africa's municipalities will, in the face of growing environmental pressures, not shy away from taking on this challenge. However, Regulation GG R711 no 34586 of 9 September 2011 aims to ensure that buildings use energy efficiently, while fulfilling the needs of the users,[314]thus directly promoting "green building" and "green design". It/ or the implementation of this regulation therefore will/may already contribute significantly to sustainable local governance.[315]

313 See par 4.3.2.2.2.
314 See par 4.3.
315 See par 4.2.

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