AN INTERNATIONAL COMPARISON OF GREEN STAR BUILDING ALLOWANCES WITH EMPHASES ON A SOUTH AFRICAN APPLICATION

by

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DEDICATION

To my Heavenly Father, who gave me strength, wisdom and perseverance; without Him I am nothing.
To my supervisor, Hanneke du Preez, who guided me through the whole process and encouraged me to stay focused.
To my uncle, Pieter Gräbe, who helped and provided me with valuable information that was needed for this study.
To my mother and father and whole family, who supported and believed in me.
Thank you, I cannot express my appreciation enough. I am forever grateful and blessed.

Finally it's done!

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AN INTERNATIONAL COMPARISON OF GREEN STAR BUILDING ALLOWANCES WITH EMPHASES ON A SOUTH AFRICAN APPLICATION

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In South Africa around 23% of emissions are caused by the operation of residential and non-residential buildings. In the last five years building owners and contractors have begun to focus on more environmentally friendly building techniques. This has resulted in an emerging market in South Africa for green buildings. A green building is one that is environmentally responsible, while it is energy and resource efficient. The Green Building Council of South Africa was formed to establish the requirements for qualification as a green building. As green buildings are a fairly new concept in South Africa, an additional allowance will encourage building owners to construct a green building as opposed to an ordinary one. Currently a tax allowance is available under Section 13 of the Income Tax Act for manufacturing and a Section 13quin allowance for newly constructed commercial buildings. In other countries such as the USA, an allowance is obtainable for green buildings under the Federal Tax Code. The first 5-Star Green Star SA Office Design v1 rated building in South Africa was used as a case study to indicate the effect of an additional tax allowance on South Africa. The case study indicated that to be a green building, many requirements have to be met, thus an additional tax allowance would encourage building owners to construct green buildings and in a way it can be seen as an incentive to promote sustainability in the long term.

KEY WORDS:
Green building
Tax allowance
Environmental sustainability

OPSOMMING

‘N INTERNASIONALE VERGELYKING VAN GROEN STER GEBOU TOELAE MET DIE KLEM OP ‘N SUID AFRIKAANSE BENADERING

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In Suid-Afrika word 23% van kweekhuisgasse veroorsaak deur die bedryf van residensiële en nie-residensiële geboue. In die afgelope 5 jaar het gebou eienaars en oprigters begin fokus op omgewingsvriendelike gebou tegnieke. Gevolglik het dit aanleiding gegee tot ‘n opkomende mark vir groen geboue in Suid-Afrika. ‘n Groen gebou is ‘n gebou wat verantwoordelik is vir die omgewing en ter selfde tyd energie en hulpbron effektief is. Die ‘Green Building Counsel of South Africa’ is gestig om die vereistes om as groen gebou te kan kwalifiseer vas te stel. Groen geboue is ‘n redelike nuwe konsep in Suid-Afrika en dus sal ‘n addisionele belastingtoelaag gebou eienaars aanspoor om eerder ‘n groen gebou op te rig teenoor ‘n gewone gebou. Tans is daar slegs ‘n toelae onder artikel 13 van die Inkomstebelasting Wet vir geboue wat gebruik word in die proses van vervaardiging of artikel 13quin toelae vir nuut en ongebruikte kommersiële geboue. In ander lande soos die VSA is daar reeds belastingtoelae vir groen geboue beskikbaar onder die ‘Federal Tax Code’. Die eerste 5 ‘Star Green Star SA Office Design v1’ gegradueerde gebou in Suid-Afrika is in die gevallestudie gebruik om die effek van addisionele belastingtoelaag aan te dui. Die gevallestudie dui aan dat ‘n groen gebou aan baie vereistes moet voldoen, en dus sal ‘n addisionele belastingtoelaag gebou eienaars aanspoor om ‘n groen gebou op te rig. Die addisionele geboutoelaag kan ook gesien word as aansporing om volhoubaarheid te bevorder.

Sleutelwoorde:
Groen gebou
Belastingtoelae
Volhoubaarheid

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

People and organisations try to improve their life expectancy or sustainability as a company. In a world where change is constant, everyone is trying to improve life for example by growing more organic fruit and vegetables, emailing more and printing less, and minimising the carbon footprint. In the current corporate world, sustainability has become one of the main factors on which a company's performance is measured.

The main focus of the Green Building Council of South Africa (GBCSA) is to promote a healthy and productive environment for all South Africans. To achieve this, buildings must be erected and operated in an environmentally sustainable way (GBCSA, nd).

The main objective of the GBCSA is to urge companies to be more sustainable corporate citizens by erecting green buildings (GBCSA, nd).

What is a green building? In broad terms, a green building is one that is environmentally responsible, while it is energy and resource efficient, and thus in effect reduces the negative factors that arise from the development of new buildings (GBCSA, nd).

In South Africa, around 23% of emissions are caused by the operation of non-residential and residential building sectors. Investments in residential and non-residential buildings will grow 2% per year in the next 38 years, according to historical trends and anticipated government investment programmes. If the emissions that are caused by residential and

non-residential buildings are overlooked, carbon dioxide (CO_2) emissions will more than double over the next 38 years (Sustainable United Nations, 2009:1).

Sefton (2009) stated that green buildings will reduce emissions of CO_2 and other discharges with similar impacts. Conventional buildings produce twice as much waste and consume almost double the energy and water of a green building. Thus the GBCSA urges developers to go green. In return this will transform the South African property industry by building more sustainable buildings. In effect, this will reduce energy and resource consumption, and will contribute to a cleaner environment for the future.

Research has been conducted on reducing greenhouse gas emissions and the possible, implementation of a carbon tax (National Treasury, 2010:3). Research indicates the effects that buildings have on the environment, the emissions these buildings release (Sustainable United Nations, 2009:1), and why it is important to reduce them by constructing green buildings (GBCSA, nd). Little consideration have been given to a company that has erected a green building and, more importantly, to whether that company can qualify for a tax allowance in addition to a Section 13 allowance, as stated in the Income Tax Act, No. 58 of 1962. However there is a proposed section 12L in the Income Tax act that will allow the taxpayer to claim a notional allowance for income tax purposes that is part of an energy savings incentive during any year of assessment ending before 1 January 2020.

1.2 PROBLEM STATEMENT

Although research has been conducted and green building tax allowances have been implemented in developed countries such as the USA (US Department of Energy, 2010:5; New York State Energy Research & Development Authority, nd; Department of Environmental Conservation, nd), in South Africa there is only a tax allowance for a Section 13 building according to the Income Tax Act that is implemented. Section 12L in the Income Tax Act that specifically relates to energy efficiency savings is not yet implemented and only proposed.

Thus there is no additional tax allowance for a green building that has been implemented in terms of the guidelines provided by the GBCSA, although section 12L would possibly apply for a green building if this section will be implemented. In previous studies there have only been proposals for carbon tax (National Treasury, 2010:3). Carbon tax will focus on taxing a company based on the emissions the company produces. Thus it is a direct tax that will be imposed on companies, and not a tax allowance.

The green building market has only recently emerged in South Africa, and an additional tax allowance specifically for green buildings would prompt developers and owners of upcoming commercial buildings to consider constructing a green building.

1.3 PURPOSE STATEMENT

The purpose of this study is to explore the possibility of introducing a specific tax allowance for companies that construct new green buildings in terms of the guidelines provided by the GBCSA. It will focus on an academic perspective as well as a practical one.

From an academic point of view, this study will make three contributions. First, this will be the first study to suggest that tax allowances should be given to companies for constructing green buildings in South Africa. Second, it will demonstrate the effects on the income tax payable by companies that have green buildings compared with companies that do not. Third, it will illustrate that green building tax allowances have already been implemented in other developed countries.

From a practical perspective, this study will explain that a company that constructs a green building could possibly receive additional tax allowances. Thus the income tax payable by that company will be less than that of a company that did not construct an environmentally friendly building. In the long term, this tax allowance could prompt companies to construct green buildings, which would lead to fewer emissions being released in the environment, resulting in more sustainable surroundings.

To provide the property industry with an objective measurement for green buildings, the GBCSA (GBCSA) has developed a green star rating tool, based on the Green Building Council of Australia (GBCA) (GBCSA, nd).

Australia will be used as one of the countries in this case study because the South African market can relate to the building industry of Australia and the idea of rating commercial buildings is derived from Australia. Although the South African Green Star rating tools are based on the Australian model the South African rating tool will be tailored to suit the South African climate, ecological, regulatory and commercial environment.

Through this information it will be determined whether Australia has already implemented a tax allowance for green buildings, and whether it could apply to South Africa.

Leadership in Energy and Environmental Design (LEED) was developed by the US Green Building Council (USGBC) in 2000, and is the certification process to identify the standard for measuring building sustainability. A framework is provided by LEED to identify and implement practical and measurable green design (US Green Building Council, nd).

According to the Federal Tax Code, there is a tax allowance for green buildings in Section 179D. The USA is the other country that is used in this case study as it is one of the developed countries in the world and it seems that it is the world leader in providing a specific tax allowance for green buildings.

In South Africa there are no additional tax allowances for green buildings. Consideration will be given to the tax allowances for green buildings that are implemented in the USA and Australia and whether they could be implemented in South Africa.

1.4 RESEARCH OBJECTIVES

The study will be guided by the following research objectives:

- To identify the building requirements to qualify as a green building in terms of the GBCSA criteria.

- To investigate the green building tax allowances that have already been implemented in developed countries such as the USA and Australia.
- To determine the effect of the implementation of a green building tax allowance in South Africa with the focus on Aurecon's administrative building in Century City, Cape Town.

1.5 DELIMITATIONS AND ASSUMPTIONS

1.5.1 Delimitations

Several delimitations have been identified. First, the study will not focus on the carbon footprint of the building, thus not on a carbon tax. The focus will not be on sustainability, but on the possibility for a new building to qualify as a green building in terms of the GBCSA, and whether an additional tax allowance should be recommended for a green building.

Second, the technical requirements as engineering and constructing a green building will not be examined in depth, but the costs and the advantages that a tax allowance could have in the long term for constructing a green building will be examined. The focus will not be on residential buildings, but on commercial and administrative building. The emphasis will be on newly constructed green buildings, and not on buildings that have been retrofitted to comply with the requirements of an environmentally friendly building.

Section 12L of the Act specifically relates to energy efficiency savings and is not yet implemented but only proposed. An energy efficiency savings certificate that is compiled by an independent and registered measurement and verification professional is needed by a company to gain the benefit of Section 12L. The allowance that is available under Section 12L is determined by a formula, and propose that taxpayers are entitled to claim a notional allowance for energy efficiency savings resulting from activities in the production of income during any year of assessment ending before 1 January 2020. To be able to claim the Section 12L allowance the energy efficiency savings of the building will be

needed. Aurecon is a newly constructed green building and this information will not be available yet, thus Section 12L will not be applicable to this study.

This study will not focus on the available allowances under Section 12C of the Act that relates to deductions in respects of assets that are used by the taxpayer for the purposes of his trade or directly in the process of manufacturing.

The focus will be on a Green Star rated building that has been constructed in South Africa namely the Aurecon administrative building in Century City, Cape Town.

Finally, the literature review will be limited to literature from disciplines such as economics and management science relating to taxation, as well as the economic benefits a green building has on the overall financial performance of a company, but it will not exclude literature on green sustainability for the present as well as for the future.

1.5.2 Assumptions

Assumptions are made about green buildings and a recommended tax allowance for green buildings in South Africa. The assumptions that are made in this study are as follows:

First, it is assumed that there is only one green star rated building, namely the Aurecon office building in Century City, Cape Town.

Second, it is assumed that the buildings in this study have a green star rating that is regulated by an accredited rating body such as GBCSA, LEED or any other applicable body.

Third, the rating tools as well as the technical data that are provided by the GBCSA will be considered correct.

1.6 DEFINITION OF KEY TERMS

This study involves a number of key concepts that have to be defined, owing to the technical nature of the research that has been conducted. The key definitions are listed below.

Commercial building: a building that is used for commercial purposes, and not residential.

Emissions: In this case study, emissions refer to the pollution discharged into the atmosphere by residential, commercial and industrial facilities.

Green building: The term 'green building' as defined by the GBCSA is used. The GBCSA defines a green building as: "a building which is energy efficient, resource efficient and environmentally responsible – it incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and occupants" (GBCSA, nd).

Tax allowance: In this study a tax allowance is a deduction, exclusion or exemption offered as an enticement for constructing a commercial building.

Table 1: Abbreviations that are used in the body text of this study

Abbreviation	Meaning
BREEAM	Building Research Establishment Environmental Assessment Method
CI	Commercial Interior
CO_2	Carbon dioxide
CS	Covered by Shell
DCCEE	Department of Climate Change and Energy Efficiency
EB	Existing Building
IEQ	Indoor Environment Quality
GBCA	Green Building Council Australia
GBCSA	Green Building Council of South Africa
GFA	Gross Floor Area

Abbreviation	Meaning
HVAC	Heating, ventilation and air conditioning
IRC	Internal Revenue Code
IRS	Internal Revenue Service
LEED	Leadership in Energy and Environmental Design
NABERS	National Australian Building Environment Rating System
NC	New Commercial
UA	Usable Area
UK	United Kingdom
USA	United States of America
USGBC	US Green Building Council

1.7 RESEARCH DESIGN AND METHODS

1.7.1 Description of inquiry strategy and broad research design

Research will consist mostly of a combination of empirical and non-empirical investigations, as well as exploratory, in order to compile the most relevant research for this case study.

In South Africa the construction of green buildings is a new idea and has been implemented only recently. Owing to the complexity of the topic, as well as its nature, various research design and methods will be considered.

A qualitative research method is used in this research proposal because of the type of investigation that will be conducted in order to determine whether this is a feasible study. The aim of this qualitative research will be to conduct research by means of a case study that will be based on green buildings in South Africa.

Baxter and Jack (2008:1) define a qualitative case study as “an approach to research that facilitates exploration of a phenomenon within its context using a variety of data sources.

This ensures that the issue is not explored through one lens, but rather a variety of lenses which allows for multiple facets of the phenomenon to be revealed and understood."

From this definition it is clear that this research will have to include various data sources and techniques in order to be meaningful and to achieve the desired outcome. To do so, a case study approach will be followed, as this will provide the most meaningful data to be analysed and form a conclusion and recommendation. Thus the research design will be that of a qualitative case study.

1.7.2 Assessing and demonstrating the quality and rigour of the proposed research design

This research will be conducted through a qualitative exploratory inquiry strategy in the form of a case study. As this case study will be conducted on a topic in which the data are scarce in the South African context, the quality and rigour of the data will be determined when it is compared with similar buildings in other countries.

A few factors could potentially distort the research findings. These factors include, but are not limited to:

- If the data that is provided is inaccurate or has changed significantly since the last audit of the financial data.
- If there is a restriction on the data that are needed to conduct the case study.
- If the data that relate to the technical sections are too complex to understand, then the data could be interpreted incorrectly.

There is therefore a possibility that research findings could be distorted. Data that are collected must be from a reliable source. Financial data must be supported by audited financial statements. This will contribute to minimising data distortion.

1.7.3 Characteristics of a case study

A case study is a qualitative research method that may be defined as “an examination of a specific phenomenon such as a program, an event, a person, a process, an institution, or a social group” (Merriam, 1998:9).

A case study has the following characteristics (Willis, 2007:13):

- The focus is on a particular context such as one person, an office, a company or a building.
- The focus is on real events.
- Case studies have descriptive data.
- Case studies rely on logical reasoning.
- Case studies enlighten the reader’s understanding of a phenomenon under study and can bring the discovery of new meaning, experience or can verify what the reader already knows.

1.7.4 Challenges in conducting this case study

This research, which is focused on the recommendation of a tax allowance for green buildings in South Africa, creates several challenges. As this is a fairly new concept in the South African building sector, various data sources have to be consulted and considered. The first 5-Star Green Star SA Office Design v1 rating was awarded to Aurecon’s office building in Century City, Cape Town, in 2011 (Aurecon, 2011b), which makes it difficult to compare and analyse other buildings in South Africa.

Given this inherent problem, a combination of research strategies will be used that will include empirical and non-empirical methods as well as exploratory studies. Thus overall a qualitative research approach will be followed. Previous studies have also used qualitative approaches to learn what other countries have done with regard to developing policies for green buildings (Retzlaff, 2010).

When conducting exploratory research, the aim will be to provide the researcher with basic understanding of a new topic. To achieve feasibility in this study an extensive survey will be done on green buildings. The characteristics of this exploratory research will not give definite answers, but it will involve an assessment of existing literature.

1.7.5 Data collection

The data collection will mostly be qualitative through research of the literature that relates to this building.

The research methods that will be used will be a combination of research strategies. In some instances, it could be necessary to collect data from a direct source in Aurecon. This source could not been established, since up until this point the research is not sufficient to determine the data that will be needed from a direct source in Aurecon.

1.7.6 Research ethics

As this will be a case study based on Aurecon's office building in Century City, Cape Town, the data that will be needed are of such nature that they require the permission of Aurecon to use them. Thus ethical clearance forms were submitted to the University of Pretoria and permission was obtained from Aurecon and Rabie, the owners of the building.

1.8 OVERVIEW OF CHAPTERS

This study has five chapters. Chapter 1 gives a broad background on the overall study. Chapter 2 is a literature review, which provides more details of the history of green buildings and investigates the green building situation in USA and Australia. In chapter 3 the current situation in South Africa is discussed. This chapter expands on the regulatory body for green buildings in South Africa. Chapter 4 is a practical case study on a green building in South Africa. Chapter 5 deals with the conclusions that are reached based on the case study and literature review.

CHAPTER 2

2 HISTORY OF GREEN BUILDINGS

2.1 INTRODUCTION

In the last decade green building or sustainable design and development have been under the spotlight. However, this concept started more than a century ago. In the nineteenth century there were structures that incorporated the designs and techniques of green buildings today. These included London's Crystal Palace and Milan's Galleria Vittorio Emanuele II, which used roof ventilators as well as underground air-cooling chambers to moderate indoor temperature. In New York, skyscrapers emerged with these characteristics, such as New York's Flatiron Building and the New York Times Building, in which deep-set windows to shade the sun were built in (Anonymous, 2003:4-6).

This was the beginning of a new era and concept in the design and construction of buildings, which resulted in the green buildings of today.

2.2 WHY IS THERE A NEED FOR GREEN BUILDINGS

Global warming and heightened awareness of the need to conserve resources have contributed to the increased desire for green buildings (Ridgeway, Miller & Meyette, 2008:52-54).

Temple (2006) reported research that had been done on the buildings in the USA. It was found that 42% of the nation's energy, 30% of raw materials, and 25% of solid waste were consumed by buildings, while 40% of atmospheric emissions were produced by these buildings.

Emissions that are released by buildings are increasing steadily. The only way to reduce this increase is to encourage developers and building owners to construct green buildings.

In the long term, green buildings offer a healthier and cleaner environment, as well as a future of sustainable development (Colin, 2008).

2.3 WHAT IS A GREEN BUILDING

In broad terms, a green building is environmentally responsible, energy and resource efficient, and effectively reduces the negative factors that arise from the development of new buildings (GBCSA, nd).

Holusha (2000) defines green buildings as those that use energy more efficiently than buildings with conventional designs. These green buildings are well-lit spaces that promote an open plan construction that is filled with an abundance of clean air.

From these two definitions, a green building must be energy-efficient and environmentally friendly, which will preserve the environment and will be sustainable in the long term.

2.4 WHAT IS THE COST OF A GREEN BUILDING

In the past, the biggest challenge to and discouragement for green construction was the cost. All the costs that relates to environmentally friendly materials, design and construction contributed to higher prices because designers and constructers were unfamiliar with green building requirements (Ridgeway *et al,* 2008:52-54).

This has become more irrelevant as awareness of global warming has developed in the public consciousness. Environmental responsibility from architects and builders is demanded by society. This is resulting in a decrease of the cost of green construction as constructors and architects become more familiar with these green building requirements (Ridgeway *et al,* 2008:52-54).

Langdon (2007) did a study on the difference in average cost for green buildings and non-green buildings, and found that there was no significant difference. LEED certification is being achieved, although there has been an increase in the construction cost overall.

However, Langdon (2007) stated that green is still viewed as an extra feature, rather than an accepted normal part of construction.

On the other hand, LEED-certified and similar buildings can have beneficial long-term savings for building owners, resulting in reduced costs for water, power, heating and cooling (Ridgeway *et al,* 2008:52-54).

Geof Syphers, director of green building services with KEMA-Xenergy, said that a recent analysis showed that the premium for green public buildings is falling quickly. Initial estimations show that the premium for LEED-rated buildings is at 2–5% for certified projects and 5–10% for silver, gold or platinum buildings, but currently the estimations are much lower (Building Design & Construction, 2003).

The following factors, as identified by Syphers, with the focus on LEED requirements, can be considered when determining the costs of a green building (Building Design & Construction, 2003):

- There is the shortcoming of a clear design. The design of the building must be set at an early stage of the planning of the building.
- Green design is incorporated only at a later stage in the construction of the building. At first this will be an added cost, as the building has to be redesigned, but in the long term the benefits of the reduced operating costs will pay off.
- There must be a single point of responsibility for the LEED process. For LEED research, implementation and documentation, experience in green building is required to achieve the required outcome.
- Insufficient knowledge and experience of LEED can lead to time being wasted on research of inappropriate technologies, rather than the methods that must be used and implemented in the planning and construction process.
- There is a time constraint to research material and technologies. Constantly new trends and techniques become available in the market for green products. If research time is not used effectively, this may lead to additional costs that are being spent on the search for the right products and techniques.

Other factors that have to be considered when the cost of a green building is determined are the savings that will be generated through not polluting the environment.

In the developed world, carbon emissions have become real costs to building owners. There is an expectation that carbon tax will be levied on energy consumption. The intention is to prompt building owners to be more environmentally aware, reduce their carbon tax, and receive allowances for their environmentally friendly implementations (Langdon, 2007:5).

The overall effect is that a tax allowance will be accessible to building owners in relation to their carbon emissions. This will be an incentive to encourage building owners to construct buildings that are more energy efficient and reduce their impact on the environment. In the long term this will act as a safeguard for buildings that are more environmentally friendly and will minimise the effects of future energy price increases (Langdon, 2007:5).

It is not only the monetary factors that have to be considered when the cost of a green building is determined, but various aspects have to be implemented at the planning stage to make sure that all the relevant factors have been considered in order to achieve the best possible cost for a green building.

2.5 TAX ALLOWANCES FOR GREEN BUILDINGS IN THE USA AND AUSTRALIA

The USA Green Building Council established the LEED certification system. In the USA, LEED certification is the standard for sustainable buildings. Buildings that qualify for the higher LEED certification achievements, such as silver, gold and platinum status, are eligible for a Section 179D deduction in terms of the Federal Tax Code (Goulding, Goldman and Albanese, 2011:13-14).

The Green Building Council of Australia (GBCA) was launched in 2002, and is committed to developing a sustainable property industry. The GBCA uses a green star rating tool to determine the greenness of a building, and rates it according to the standards that are set out in the GBCA documentation (GBCA, nd).

A discussion follows on tax allowances for green buildings in the USA and Australia, as well the current situation in these countries.

2.5.1 Tax allowances for green buildings in the USA

A 'green building allowance' against income taxes has been adopted by New York State in an attempt to make commercial and residential buildings more efficient and in harmony with the environment (Holusha, 2000).

On 15 May 2000 the tax allowance was included in the state budget. The green building allowance was implemented to encourage building owners and developers to use more environmentally friendly products and construction techniques when buildings are erected. This allowance is limited to a total of $25 million for all projects over a five-year period (Holusha, 2000).

Green buildings were incorporated in the Federal Tax Code in 2005, which created the commercial building tax allowance. This means that there is a tax benefit for owners of buildings that are energy efficient and that use environmentally sound building practices to achieve the desired level of energy savings (Ridgeway *et al,* 2008:52-54).

Altman (2009) states that an allowance is available from the costs of a commercial building that is energy efficient. These buildings, however, must be placed in service before 1 January 2014.

The Internal Revenue Code (IRC), Section 179D, provides an allowance for energy-efficient features of the building of up to $1,8 per square foot. This allowance applies only if the taxpayer uses the services of a qualified professional engineer or contractor. This person must use software as prescribed by the IRC (Watson, 2009:44-46).

To qualify for a Section 179D allowance, it must be an energy-efficient property, installed or placed into service as a commercial building. A building that is used for retail,

manufacturing, offices or warehousing will qualify as a commercial building. The commercial building must be allocated in the USA (Zerbe, 2011:2).

Admin (2012) argued that normally the costs of a building would be recovered through the depreciation and it could last up to 39 years or more. The Section 179D deduction allows the taxpayer to subtract an immediate expense for the cost of the property. In order to qualify for this deduction power costs must be reduced by 50% through energy-efficient improvements and annual energy and power savings. This deduction can be partially allowed, based on the savings of the power costs.

The following deductions are available according to Section 179D (Zerbe, 2011:30):

- $1,8 per square foot if the total annual energy and power costs are reduced by 50% or more. This refers to lighting, heating, ventilation and air conditioning (HVAC), and hot water.
- $0,60 per square foot for the shell of the building if the reduction is at least 10%.
- $0,60 per square foot for HVAC and hot water if the reduction is at least 16,67%.
- $0,3–0,60 per square foot for interior lightning if the reduction in cost is at least 16,67% or if the reduction in lighting power density is at least 25%.

Section 179D deductions are explained in table 2:

Table 2: Example of Section 179D

Facts	Results
Building size in square feet	114 000
Energy-efficient improvements	High efficiency lighting, upgraded insulation, upgraded HVAC systems
Building annual energy cost	$68 501
Actual building costs	$17 508
Percentage energy savings	74%
IRS threshold for full $1,8 square foot 179D deduction	50%
Building qualified for full $1,8 per square foot deduction	$205 200

Source: Corp Professional Services (nd:19)

From the above example, the percentage energy savings of 74% is calculated as the total building cost of $68 501 minus the actual building cost of $17 508 divided by the total building cost of $68 501 multiplied by 100. The energy savings are therefore more than 50% and this building will qualify for a Section 179D deduction of $1,8 per square foot of the building, resulting in $205 200 being subtracted.

2.5.2 Tax allowances for green buildings in Australia

The GBCA has five priorities in place, one of which is their 'green building agenda', with which they encourage all building owners and constructors to commit to green buildings (Anon, 2011).

In 2010 the Australian Department of Climate Change and Energy Efficiency (DCCEE) announced a programme for green buildings, namely Tax Breaks for Green Buildings. From 1 July 2011 a business would be able to claim a once-off bonus tax allowance of 50% of the costs of the assets that related to the energy efficiency of the commercial building (DCCEE, nd).

To qualify for this tax allowance, there has to be a significant improvement in the energy efficiency of the building (DCCEE, nd).

The aim of the tax allowance for the Green Buildings programme is to include as much as possible of Australia's building environment to ensure that the building sector has the maximum benefit of this tax allowance by encouraging building owners and constructors to be environmentally more acceptable (Anon, 2011).

Tax allowances for green buildings is a relative new concept in Australia. Only after a period of implementation will one be able to conclude whether the Tax Breaks for Green Buildings programme has worked effectively and efficiently.

According to Cantwell (2011:1), there are currently no tax allowances for newly constructed green buildings in Australia. There is a once-off bonus tax allowance of 50%

for the cost of improvements, that is, an additional tax allowance to the normal capital allowance deduction of 150% the total value to be deducted over the life of the building.

Cantwell (2011:1) states that this additional 50% allowance is available to existing commercial buildings that are covered by the National Australian Building Environment Rating System (NABERS). To qualify for this allowance the buildings must have a minimum rating of four stars in terms of the NABERS.

According to Cantwell (2011:1), this scheme commenced on 1 July 2011 and will be available until 30 June 2015. Currently 1 billion Australian dollars is allocated to it. With this allocated amount, there is uncertainty as how this allowance will be granted. Will it be on a 'first come first served' basis or will the projects that perform best have preference?

According to Cantwell (2011:2), three key requirements have to be met to obtain the tax allowance. These are:

- An initial retrofit proposal has to be submitted, which has to be accepted and registered by the DCCEE.
- The retrofit must be implemented. Thus proposals that are related to contracts of retrofits that have not been registered will not be applicable for this deduction.
- When the work has been completed, a new 4-star+ rating must be obtained from NABERS.

Australia is therefore still in the process of implementing tax allowances for green buildings. The only tax allowance currently available is the 50% additional tax concession discussed above.

2.6 CONCLUSION

Green buildings must achieve the desired decrease in emissions. The cost of constructing these buildings may discourage developers of commercial buildings at first, but in the long term the savings will be more beneficial to the owner than the initial construction costs.

Building allowances for green buildings are still in the developing stages. Australia is in the process of implementing a green building tax allowance. However, in the USA a Section 179D allowance is already available for green buildings, making them the world leaders in this area.

In the following chapter, attention is given to the current situation in South Africa, as well as the current tax allowance that is available for commercial buildings.

CHAPTER 3

3 CURRENT SITUATION IN SOUTH AFRICA

3.1 INTRODUCTION

Although the market for green buildings is still in an early stage, there is an increase in awareness of green building practices. One of the factors contributing to this awareness is that companies are socially committed to being responsible developers, thus resulting in the demand for green buildings (25 degrees.net, nd).

Currently the only deductions that are available for buildings are 1) Section 13 tax allowance in terms of the Income Tax Act, No. 52 of 1962, which allows for a deduction in respect of buildings that are used in the process of manufacturing; and 2) a Section 13*quin* deduction for a commercial building that is equal to 5% of the costs to the taxpayer for any new and unused building that is owned by the taxpayer.

3.2 NEED FOR GREEN BUILDINGS IN SOUTH AFRICA

Green buildings provide a way for corporations to improve their social awareness and in effect will meet the expectations of their stakeholders who are sensitive to the environment (Business Wire, 2010).

There has been a growth rate of over 100% per annum from the date that membership of the GBCSA was opened in 2008 (Business Wire, 2010). This increase is an indication that the market is becoming more aware of the need for green buildings in South Africa (25 degrees.net, nd). Currently the GBCSA has 1 000 members and they want to extend these numbers to 1 500–2 000 members (Green Business Guide, nd). Still inconsistent.

South Africa's greenhouse gas emissions are low in comparison with India and sub-Saharan Africa (Energy Research Centre, nd:2). Thus it seems that companies in South

Africa are not so concerned about climate change, but want to meet the expectations of their shareholders (Business Wire, 2010). The main reason is that multinational companies that operate in South Africa have holding companies in countries where green buildings are minimum requirements, and thus they want their executive boards to operate in green buildings (Business Wire, 2010).

It seems therefore that the main reason that companies in South Africa are constructing green buildings is only to satisfy the expectations of their shareholders, rather than improve their environmental status. In the end, it will not be a matter of satisfaction, but of contributing to a better environment, regardless of the initial intentions of the owner and constructor of the green building.

One of the most important factors in promoting sustainability is a strong legislative environment that has financial incentives to encourage building owners and constructors to be more energy efficient with the focus on being more sustainable in the long term (25 degrees.net, nd).

Promotion of financial incentives in the form of tax allowances and certain exemptions for green building constructors, owners and tenants will encourage developers of commercial buildings to be more environmentally considerate and to weigh up the advantages of green buildings in future as opposed to uncertified buildings (25 degrees.net, nd). The Department of Trade and Industry (DTI) has plans to amend the energy-efficiency regulations, which will make it compulsory for new buildings to be more energy efficient and to reduce their energy consumption (Directory of Design, nd).

There are no implemented tax allowances for green buildings in South Africa only a proposed tax allowance under Section 12L of the Act. Such a tax allowance might motivate developers and designers to construct green buildings. These allowances would contribute to a more sustainable environment that is more acceptable by society.

3.3 GREEN BUILDING COUNCIL OF SOUTH AFRICA

The GBCSA is a member of the World Green Building Council, and is the certification body of buildings under the Green Star SA Rating System. The objective of the GBCSA is to promote environmentally sustainable living to ensure that South Africans work and live in an environment that is healthy, effective and productive (GBCSA, nd).

3.3.1 How is a Green Star rating determined

The rating of a green building is determined through certain criteria set out by the GBCSA. Building owners must submit documentation to the GBCSA to achieve certification for their buildings. This certification is done by independent assessors who are employed by the GBCSA. They assess the submissions of the building owner and score the building. Certification is then awarded for 4-star, 5-star or 6-star Green Star SA ratings (GBCSA, nd).

In other countries, rating systems have been implemented. This includes LEED in the USA, BREEAM (Building Research Establishment's Environmental Assessment Method) in the UK and Green Star in Australia. The GBCSA decided to base the South African rating tool on the Australian Green Star system and to tailor it to the South African environment and building sector (GBCSA, nd).

3.4 IMPORTANCE OF THE GBCSA

In the building sector, green building owners promote their constructions as environmentally friendly (green). The GBCSA provides a rating tool to determine whether a building complies with the regulations as set out by the GBCSA in order to qualify as a green building with an accredited green building rating. Therefore the GBCSA plays an important role in the validity of a green building.

3.5 CONCLUSION

Buildings make a considerable contribution to the quality of our lives: we spend up to 90% of our time in buildings. The energy that goes into buildings is about 40% of the annual global consumptions of materials and energy (Clark, nd).

Although green buildings in South Africa are still a fairly new concept, the idea of an environmentally friendly building is not new to the world. The society of today is seeking more environmentally acceptable practices that have to be implemented owing to the climate change, as well as the need to limit corporate waste (Holbrook, 2009).

In the following chapter a tax allowance for green buildings is explored in a case study in which the focus is on Aurecon's office building.

CHAPTER 4

4 CASE STUDY BASED ON AURECON'S OFFICE BUILIDNG

4.1 INTRODUCTION

The main focus of this chapter is on Aurecon's office building, which is situated in Century City, Cape Town. Aurecon's building is the first in South Africa to be awarded a 5-star Green Star SA Office Design v1 rating by the GBCSA.

This case study uses Aurecon's office building as the object. A comparison is then made between the rating systems that South Africa and the USA have in place to determine the greenness of a building.

The GBCSA uses rating tools as well as project certification to determine the greenness of a building in order to award the applicable rating. To fully understand the case study, the technical side of the rating tools and the project certification are explained in more detail.

The tax allowance that is currently implemented in the USA, according to Section 179D of the Federal Tax Code, will be applied to Aurecon's office building ,and a tax comparison will be done by determining the effect if a tax allowance similar to the USA's tax concession for green buildings pertained to Aurecon's office building.

4.2 RATING TOOLS IN SOUTH AFRICA

The green building rating tool assists the GBCSA to determine how 'green' the building is. This tool sets benchmarks and specific standards to enable the GBCSA to make an objective assessment on how 'green' the building really is. This rating system is designed in such a way that it sets out all the green measures that can be incorporated and implemented when designing and erecting a building to achieve a green structure. The greenness of a building is based on points that are awarded through this rating tool,

according to steps incorporated in the building to achieve this green rating. These points are weighted and a total score is calculated to determine the rating of the building (GBCSA, nd).

4.3 GREEN STAR SA RATING TOOLS

The Green Star system was developed by the GBCA, based on the Australian system, but adapted it to market and environmental criteria that relate specifically to South Africa. The Green Star SA system is intended to provide an objective measurement of green buildings, to assess the elements that contribute to a green building specifically in South Africa, and to reward environmental leadership in the building sector (GBCSA, 2008: ix).

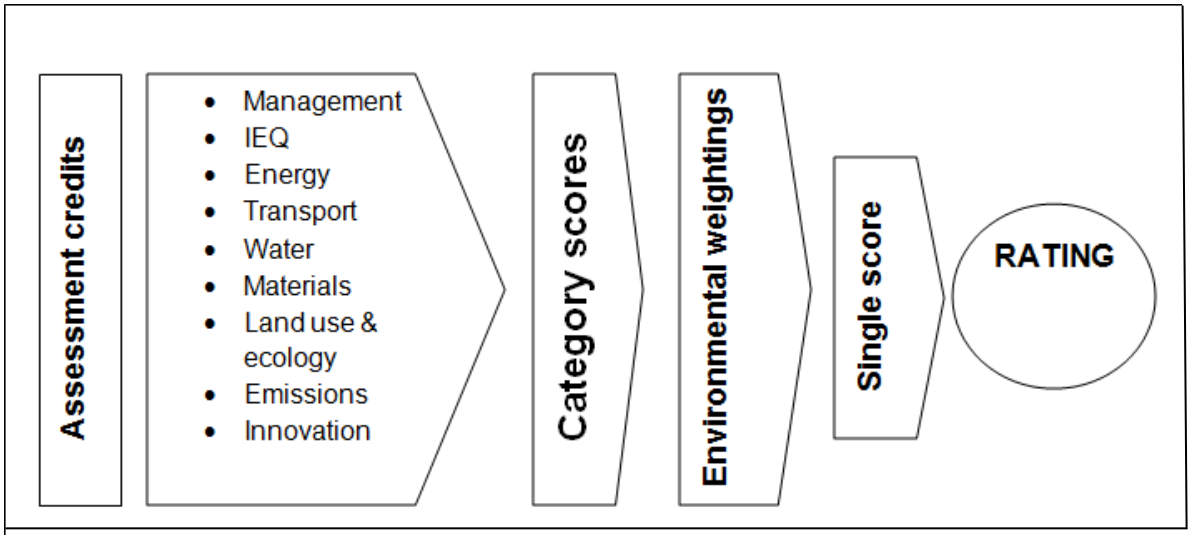
There are various market sectors in the building industry with different Green Star SA rating tools for each sector. These Green Star SA rating tools are Multi Unit Residential v1, Public and Education Building, Office v1 and Retail Centre v1. Each of these Green Star SA rating tools has criteria to be met to achieve the desired Green Star rating (GBCSA, nd).

In each market sector, categories determine the ratings. These categories are management, indoor environment quality (IEQ), energy, transport, water, materials, land use and ecology, emissions and innovation. Credits are given, based on these categories, and points are then awarded if the objectives of a Green Star SA rating have been met (GBCSA, nd).

After the assessment of each category, a percentage score is calculated. A Green Star SA environmental weighting factor is then applied to each of the project's category scores to reach a single score overall. Because there are different environment concerns for different building types, the Green Star SA weighting factors differ. Thus a weighting is applied to each category score to ensure that each category is fairly presented within the rating tool.

The structure of the Green Star SA rating system is presented in Figure 1.

Figure 1: Structure of the Green Star SA rating system



Source: GBCSA (2008: x).

The category score is determined based on the percentage of credits that is achieved. Thus the number of points achieved is divided by the total number of points that are available.

The Green Star SA rating is based on the weighted category scores and not the total number of points that are achieved in each category. The weighted category score is calculated from the category score multiplied by the weighting factor multiplied by 100.

The single score is the overall score and is worked out by adding together all the weighted category scores and determining the rating of the building from the single score.

Table 3 summarises the points that are available in each category, as well as the weighting that applies to each category.

Table 3: Available points and weightings with different environmental rating tools

Assessment credits	Points available	Weightings
Management	14	9
IEQ	27	15
Energy	30	25
Transport	14	9
Water	14	14
Materials	17	13
Ecology	9	7
Emissions	16	8
Innovation	5	Not applicable
Total	**146**	**100**

Source: GBCSA (2008:365).

The weighted category score can be calculated as follows:
For example: 15 category points are achieved in energy and the total available points are 30. So the category score will be 15/30 x 100 = 50%.

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Table 3 indicates that the weighting for energy is 25. Thus the weighted category score can be calculated as 0,50 x 25 = 12,5. When calculating the overall score, the energy's score will be 12,5 out of the total weighted category score.

Based on the total of the weighted category score for all the assessment criteria, the rating for the building is determined. Table 4 indicates the Green Star SA is awarded based on the total weighted category score, also known as the single score.

Table 4: Green Star SA rating tool scores

Overall Score	Rating	Outcome
10–19	One star	Not eligible for formal certification
20–29	Two star	Not eligible for formal certification
30–44	Three star	Not eligible for formal certification
45–59	Four star	Eligible for Four Star Certified Rating, which recognises /rewards 'Best Practice'
60–74	Five star	Eligible for Four Star Certified

Overall Score	Rating	Outcome
		Rating, which recognises /rewards 'South Africa' Excellence'
75+	Six star	Eligible for Four Star Certified Rating that recognises /rewards 'World Leadership'

Source: GBCSA (2008:xii)

There are rating tools for various phases of the building lifecycle, namely design, construction, operations and refurbishment, as well as for the different building classes, which include office, retail, healthcare, education, residential, industrial and public buildings (GBCSA, 2008: ix).

4.4 PROJECT CERTIFICATION

Project certification is a formal process that is implemented by the GBCSA, which is known as the Green Star SA Certification process. This process is applied in order to guide and design construction by using a Green Star SA rating tool. The certification process is divided into two rating tools, namely 'Design' and 'As Build' certification. These are two separate certifications and have to be considered separately when the rating of a building is determined (GBCSA, nd).

The intention of the Design certification is to give the owner the ability to market the building as a Green Star SA certified building. To do that, the owner of the building must demonstrate that the strategies of green building will be included in the construction. When the building has reached the end of construction, the project can be submitted for an 'As Build' certification, stating that the green building strategies have been implemented that were indicated in the design phase (GBCSA, nd).

4.5 RATING TOOLS IN THE USA

The USGBC developed the LEED rating system, which is the best known green building rating system in the USA (Macaluso, 2007). The LEED rating system is divided into various categories:

- LEED-NC for new commercial buildings
- LEED-EB for existing buildings
- LEED-CS for a building structure that is covered by its core and shell
- LEED-CI, which is applicable to the commercial interior for tenant fit-outs

Thus it seems that LEED-NC is the most applicable category for the scope of this study.

4.5.1 LEED rating system for LEED-NC buildings

To achieve LEED rating points, points are awarded in the applicable credit assessment categories. The categories for LEED-NC buildings are presented in Table 5.

Table 5: LEED-NC credit assessment point system

Category	Points
Regional priority	4
Innovation & design process	6
Water efficiency	10
Materials & resources	14
Indoor environmental quality	15
Sustainable sites	26
Energy & atmosphere	35
Total	**110**

Source: LEED 2009 for New Construction & Major Renovations (2008:vi-vii)

The construction of new green buildings can achieve different scores based on the ratings the building achieves. This rating will determine the status of the green building. The LEED rating system is somewhat different from the Green Star SA rating system.

The Green Star SA rating system rates the buildings according to the points achieved in each category. The rating is then multiplied by the weighted factor that is applicable to each category. An overall score is calculated and an applicable Green Star rating will be given.

The LEED system is similar in categories and points per category, but the points achieved in each category are not weighted, as in the Green Star SA rating system. Thus a score is calculated based on the points achieved in each category. The Green Star SA system gives a star rating that represents the greenness of the building, whereas the LEED system gives a status to the building to represent the greenness of a building. This status is determined by the overall rating the building achieves based on the score that is calculated in each credit assessment. The ratings are presented in Table 6.

Table 6: Points required for LEED-NC ratings

Level	Points
Platinum	80 and above
Gold	60–79
Silver	50–59
Certified	40–49

Source: LEED 2009 for New Construction & Major Renovations (2012:vi-vii)

Table 6 reveals that if a building wants to achieve platinum status, then the building must achieve a high overall score in the credit assessments, as presented in Table 5. These credit assessments have subdivisions and each has its own points that can be achieved if the desired outcome is reached. The status of a building is an overall reflection of the points that are scored by the building in each category.

The concept of the Green Star SA rating system is similar to the LEED rating system, and the overall goal of the two rating systems is the same in that they determine the greenness of a building. In Table 7 a comparison is made, based on the two rating systems and categories.

Table 7: Comparison of the LEED and the GBCSA categories

Assessment credit as per GBCSA	Points available	Assessment credit as per LEED	Points available
Management	14	Sustainable sites	26
IEQ	27	IEQ	15
Energy	30	Energy & atmosphere	35
Transport	14	Not applicable	0
Water	14	Water & efficiency	10
Material	17	Materials & resources	14
Ecology	9	Regional priority	4
Emissions	16	Not applicable	0
Innovation	5	Innovation & design process	6
Total	**146**		**110**

From Table 7 it is clear that the GBCSA has more points available to determine the greenness of a building than the LEED system. However, the points that are awarded through the GBCSA are weighted before an overall score is calculated.

The points that are available in each category for LEED and the GBCSA are different in some cases. The points are based mostly on the buildings in a specific country, and thus are tailored to the economic needs of the country, as well as environmental.

The GBCSA and LEED give a green building a rating based on the overall points that were achieved in the categories. These establish the green status that the building achieves. A comparison of the difference in status under the GBCSA and the LEED system is set out in Table 8.

Table 8: Comparison of the different statuses according to GBCSA and LEED

Overall score as per GBCSA	Rating	Score as per LEED	Level
45–59	Four star	50–59	Silver
60–74	Five star	60–79	Gold
75+	Six star	80+	Platinum

Table 8 shows that the two rating systems and the points awarded give a similar building rating outcome. LEED has a higher point system, but it is because more points are

available than in the GBCSA rating system. The GBCSA rating is weighted at the end, whereas the LEED score is not weighted. It seems that a five-star rated building under the GBCSA is equivalent to a gold rating under LEED, but all the credit assessment categories in the LEED rating system have to be considered before a definite conclusion can be reached.

4.6 GREEN BUILDINGS IN SOUTH AFRICA

Green buildings reduce the negative impact that buildings have on the environment and their occupants. A green building has to be more energy and resource, efficient as well as environmentally responsible by incorporating working practices in the design, construction and operational processes. From a practical perspective, this includes different types of design techniques, materials and technology to reduce energy consumption and improve the use of resources to create an enhanced human and natural environment (GBCSA, nd).

Techniques to ensure that a building is green include specific measures in the design as well as in the building process. These measures include:

- A design that reduces the heat load
- Optimum use of natural light in the building
- Promotion of fresh air in the building
- Air-conditioning that is light and energy-efficient
- Use of materials that are environmentally friendly and non-toxic
- Waste reduction by using recycled materials
- More efficient use of water in plumbing fittings as well as harvesting water when it rains
- Use of more energy renewable sources
- Being sensitive and considering the environment and the impact the development has on it

A building is green if the construction and design implement certain practices that make the building more acceptable and environmentally sustainable to its overall surroundings, as well as to its occupants.

The first Green Star building under the GBCSA was Phase II of Nedbank's head office in Sandton. This building was certified as South Africa's first Green Star SA building under the GBCSA. It was completed in 2010 (Aurecon, 2009).

This building achieved a 4-Star Green Star SA Office Design v1 rating. This rating indicates that 'Best Practice' has been achieved by the building (Aurecon, 2009).
Aurecon's office building was the first in South Africa to be awarded a 5-Star Green Star SA Office Design v1 rating by the GBCSA. Aurecon also has an office building in Tswane, which has been registered with the GBCSA for a possible 4-Star Green Star SA rating (Aurecon, 2011b).

The next part of this chapter focuses on Aurecon's office building, which is the subject of this case study.

4.7 CASE STUDY

One of the members of the GBCSA is Aurecon, which is a silver founding member. The South African property and construction industries are facilitated and encouraged by Aurecon (Aurecon, 2011b).

The first building in South Africa to be awarded a 5-Star Green Star SA-Office Design v1 rating by the GBCSA was Aurecon's office building in Cape Town (Aurecon, 2011). This green building was developed by the Rabie Property Group, and the estimated costs of this building amounted to R130 million.

The Office v1 design rating is used to validate the environmental initiative of a new commercial building. The Office v1 includes Office v1 Design and Office v1 As Built certification criteria (GBCSA, nd).

Before Aurecon's office building could be considered, it had to be established whether it complied with the requirements to qualify as a green building as set out by the GBCSA. Green Star SA rating tools would determine whether this office building is a 5-star rated.

Points must be allocated to each assessment credit and then must be weighted in order to work out an overall score that will indicate how many stars can be allocated to the building. To establish the score of each assessment credit, a mark is allocated based on certain outcomes that must be reached by the building. Table 9 lists the points that were achieved in each assessment credit.

Assessment credits affirm what the environmental issue is, as well as the desired outcome, based on the credit that is being targeted. Each credit assessment has different types of aims that have to be met before points are awarded.

Table 9: Points achieved in each assessment credit

Assessment credits	Points available	Points achieved	Percentage of available points achieved	Weighting	Weighted score
Innovation	5	5	Not weighted		5.0
Ecology	9	0	0%	7%	0
Materials	17	8	47%	13%	6.1
IEQ	27	15	56%	15%	8.3
Energy	30	17	57%	25%	14.2
Emissions	16	10	63%	8%	5.0
Transport	14	9	64%	9%	5.8
Management	14	11	79%	9%	7.1
Water	14	14	100%	14%	14
Overall score					**65**

Source: GSSA Office v.1 Tool – Aurecon Century City

Table 9 shows the points that can be achieved in each credit assessment category. In Management 11/14 points are scored. Management has several types of criteria that have to be met before a score is given. One of these criteria is that a member in the design team must be a Green Star SA Accredited professional.

In IEQ, 15/27 points are scored. The IEQ assessment focuses on the air quality inside the building. One of the criteria is whether ventilation inside the building comes from the outside air to counter the build-up of indoor pollutants.

In Energy 17/30 points are scored. The focus of this credit assessment is that energy is used as sparingly as possible by reducing the use of lighting in the building. One of the areas in which points can be scored is if lights are used only in areas that are occupied.

In Transport, 9/14 points are scored. The aim of this credit assessment is to encourage the occupants of the building to be more environmentally aware of their surroundings. One of the design factors that can be considered is to provide cycling facilities for the occupants.

In Water, 14/14 is scored. This is an indication that the design team are serious about using water sparingly. The focus of this assessment is to decrease the use of water to a minimum through water monitors.

In Materials, 8/17 is scored. This credit assessment focuses on the materials that are used in the building process as well as their reuse value.

In Ecology, 0/9 points are scored. To score points in this criterion the assessment focuses on the reuse of land or the use of land that has previously been contaminated. This credit assessment was not applicable to the Aurecon office building.

In Emissions, 10/16 is scored. This credit assessment focuses on the emissions that are released through the refrigeration process of the building.

In Innovation, 5/5 is scored. Unlike all the other credit assessments, this assessment is not weighted. It focuses on the sustainability of the building and whether the building has contributed to a more sustainable environment.

For a detailed breakdown of all the criteria that have to be met in the credit assessments, please refer to Appendix A.

Table 9 shows that Aurecon's office building As Design scored 65 points overall. In Table 2, the Green Star SA rating tool scores are set out. If the points are between 60 and 74, then five stars are awarded.

The building information for the Aurecon building is set out in Table 10.

Table 10: Building information of Aurecon's floor area

Total gross floor area (GFA) in m^2:	7 402
Total commercial office GFA in m^2:	7 402
Total commercial office usable area (UA) in m^2:	6 138
Total car parking area in m^2:	7 315
External areas (excluding car parking) in m^2:	2 207
% of commercial office space:	100%

Source: GSSA Office v1 Tool – Aurecon, Century City

Table 10 shows that this building is used for 100% commercial purposes. The total commercial office usable area is 83%, and the total car parking area is 98% of the total gross floor area, indicating that the floor space beneath the building is used to its full potential.

Aurecon's cost structure is listed in Table 11.

Table 11: Building costs

Description	Costs
Estimated building costs	R130 000 000
Sewerage costs for a normal month	R1 667
Water costs for a normal month	R2 306
Rent	R815 413
Storage rent	R720
Terrace	R15 450
Parking rent – 153 covered bays	R114 750
Parking rent – open bays	R38 500

Operating costs	R122 889
Total cost per month	**R1 147 696**
Total cost per month as percentage of total building cost	1%

Table 11 indicates the initial building costs as R130 000 000. A building allowance is permissible under Section 13quin of the Income Tax Act, which applies to new and unused office buildings. Thus in the year that the building is ready for use, the 5% allowance under Section 13quin will apply and a deduction of R6 500 000 will be granted. This deduction is available to the owner of the building.

If we apply the principles of Section 179D of the US Federal Tax Code, then the additional building allowance would be as follows. Assume:

- One square metre equals 10,76 square feet
- $1,8 is converted at R8,65

From Table 10, the gross floor area of the Aurecon office building is 7 402 square metres, If it is converted to square feet, it would be 7 402 x 10,76 = 79 645 square feet. If we assume that energy saving is more than 50%, then the tax allowance will be the square footage of the building multiplied by the allowance under Section 179D, which is $1,8 per square feet. The allowance will be 79 645 x $1,8 = $143 361. If this is converted into rand at an exchange rate of R8,65, then the allowance will be $143 361 x R8,65 =
R1 240 080.

If a similar tax allowance were available in South Africa, then the total building allowance would have been the Section 13quin allowance plus this additional tax allowance, which would result in a total building allowance of R6 500 000 + R1 240 080 = R7 740 000.

If Section 12L will be implemented an additional tax allowance will be available and could be measured at a later stage when the total energy efficiency savings of the building could be determined.

4.8 CONCLUSION

From this case study it appears that not any building will qualify as a green building, before the criteria as set out by the GBCSA are met. The rating tools that are used to determine the greenness of the building is made up of credit assessments and the points that are allocated to each assessment criteria. As discussed, Aurecon's office building complies with these criteria and is a well-deserved 5-Star Green Star Office Design v1 rated building.

South Africa's rating system of the GBCSA compares well with the LEED rating system. Although the systems rate the buildings differently – a star rating by the GBCSA and a status according to the LEED system, as discussed – for practical purposes these two rating systems use the same principles.

Thus there could be a possibility that an additional tax allowance would be granted to green buildings in South Africa as the requirements according to Section 179D of the Federal Tax Code are met.

The next chapter is the concluding chapter and recommendations and further research areas are considered.

CHAPTER 5

5 CONCLUSION

5.1 INTRODUCTION

The main focus of this research study was to determine whether it would be possible to implement an additional tax allowance for green buildings in South Africa. The reason for proposing this additional tax concession is to encourage prospective building owners and constructors to erect green buildings rather than ordinary buildings. Initially it may seem that lots of additional costs and effort are needed to construct a green building, but in the long term this is more environmentally responsible, as well as promoting a more sustainable environment for the future.

The emissions released by the non-residential and residential building sectors amount to 23% of total emissions in South Africa (Sustainable United Nations, 2009:1). One of the ways in which South Africa can reduce this is to construct more green buildings instead of ordinary buildings. This will be beneficent to the building owner, as companies and their stakeholder want to achieve their triple bottom line and promoting green buildings will make them more environmentally accountable.

Green buildings in South Africa are a fairly new concept that was introduced by the GBCSA and based on the principles of the GBCA. There is an emerging market for green buildings. The owners of these buildings have considered the advantages in the long term, as well as the promotion of a more sustainable South Africa.

Green buildings have emerged in developed countries such as Britain, the USA and Australia. This is an indication that the South African building sector is moving in the right direction by constructing green buildings that will promote not only the environment, but also the economic welfare of South Africa.

There has been more than 100%+ growth rate in membership of the GBCSA, indicating the need for green buildings. Companies are becoming more aware of the importance of erecting green buildings and complying with the recommendations as set out by the GBCSA.

From the case study on Aurecon's office building, it appears a large number of requirements have to be met before a building can be given green status. An additional tax allowance for green buildings would encourage owners and developers to construct more green buildings in future. For all the effort and costs the building owner enters into, it seems only fair that the owner of a green building is entitled to an additional tax allowance, similar to the tax allowance that is already implemented in the USA, according to Section 179D of the Federal Tax Code.

5.2 ADDRESSING THE RESEARCH OBJECTIVE

The research objectives are set out in chapter 1 as follows:

- To identify the building requirements to qualify as a green building in terms of the GBCSA
- To investigate the green building tax allowances that have already been implemented in developed countries such as the USA and Australia
- To determine the effect of the implementation of a green building tax allowance in South Africa with the focus on Aurecon's administrative building in Century City, Cape Town

The first research objective was met in chapter 3, which explained how a Green Star SA rating is determined and in chapter 4 where the criteria as set out by the various credit assessments have to be met to achieve a certain green star rating.

In chapter 4 Aurecon's office building was used as the case study. The indications were clear that Aurecon's office building complied with all the requirements as set out by the GBCSA to be a green building.

The second objective was examined in chapter 2, which indicated that there is a tax allowance for green buildings in the USA, under Section 179D of the Federal Tax Code. This section provides an allowance of up to $1,8 per square foot for energy-efficient features for a building. In Australia there is currently no tax allowance for newly constructed buildings. However, there is a once-off bonus tax allowance of 50% for the costs of improvements to a building.

The third objective was explored in chapter 4, in which a case study was conducted based on Aurecon's administrative building. In this case study an additional tax allowance is proposed, based on the concept of Section 179D of the US Federal Tax Code. The effect of implementing an additional tax allowance will prompt building owners to construct more green buildings in future as the benefits that they will receive will not only be from being a sustainable and environmentally responsible building owner, but will also take the form of an additional tax allowance, as opposed to only Section 13quin, according to the Income Tax Act.

5.3 CONCLUSION

The implementation of an additional tax allowance for green buildings will encourage green building constructors and designers to promote the erection of green buildings rather than ordinary commercial ones. Green buildings will not only be environmentally more sustainable, but will contribute to a better future by reducing the emissions for which commercial buildings are responsible.

The cost of a green building is slightly more expensive than an ordinary commercial building, but in the long term the benefits exceed the costs.

From the case study on Aurecon's administrative building, it is evident that many requirements have to be met before a building can qualify as green. A green building is beneficial not only for the constructor and owner, but for the environment in the long term.

Green buildings promote sustainability and ensure that the building sector will strive to be more environmentally responsible.

The growing number of members of the GBCSA is an indication that the future of the building environment will be to promote green buildings. The proposal of an additional tax allowance would be a bonus for the owners of new green buildings, but it would also build in an incentive for future building owners to erect a green building instead of an ordinary commercial building. The implementation of a tax allowance specifically for green buildings, similar to the one that is implemented in the USA under Section 179D of the Federal Tax Code, will lead to benefits not only for the owner, but also for the tenants and users, as Section 179D is focused on saving energy resources.

5.4 RECOMMENDATIONS

The recommendation from this case study is to propose an additional tax allowance for green buildings in South Africa with the intention of promoting the erection of green buildings in the future.

The proposed tax allowance for green buildings in South Africa could be similar to the tax allowance for green buildings that is available under Section 179D of the Federal Tax Code of the USA. The tax allowance in South Africa can be based on saving energy resources, for example at R10 per square metre as well as on Section 12L if it is implemented. Thus the additional tax allowance that would be granted to green buildings would be based on the area of the green building that utilises energy resources more efficiently.

5.5 FUTURE RESEARCH

Green buildings in South Africa are a fairly new concept. There is still extensive research that could be done. The research that has been done was based only on the erection of new green buildings in South Africa. Future research projects could include:

- Current commercial buildings could be retrofitted into green buildings.

- The costs and the benefits of green buildings in the South African environment could be researched for future purposes.

- In this research study only the benefits for one company were explored. For future research more attention could be given to multiple buildings that are used not only for administration, but also for manufacturing and residential purposes.

- Further research could indicate the tax effect for the tenant of a green building and the possible allowances the tenant could obtain as a taxpayer.

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APENDIX A: CREDIT ASSESSMENTS

The following credit assessment criteria are set for evaluation purposes:

- Management
- Indoor environment quality
- Energy
- Transport
- Water
- Materials
- Land use & ecology
- Emissions
- Innovation

Management

Ref no	Title	Aim of credit	No of points available	No of points achieved
Man-1	Green Star SA accredited professional	A main member in the design team is a Green Star SA accredited professional	2	2
Man-2	Commissioning clauses	The assurance that building services can operate to optimal design potential	2	2
Man-3	Building tuning	High energy efficiency and occupant comfort throughout the year	2	2
Man-4	Independent commissioning agent	The assurance that buildings are designed for future maintenance	1	0

Ref no	Title	Aim of credit	No of points available	No of points achieved
Man-5	Building users' guide	An user-friendly guide must be provided, which includes relevant information for building users	1	1
Man-6	Environmental management	The adoption of a formal environmental management system	2	2
Man-7	Waste management	Minimising the construction waste going to disposal	3	1
Man-8	Air tightness management	The reduction of uncontrolled air leakage in buildings	1	1
TOTAL			14	11

Source: GSSA Office v1 Tool – Aurecon, Century City

Indoor environment quality

Ref no	Title	Aim of credit	No of points available	No of points achieved
IEQ-1	Ventilation rates	A design that provides outside air to counter the build-up of indoor pollutants	3	2
IEQ-2	Air change effectiveness	To encourage systems that effectively deliver maximum air quality throughout the building	2	0
IEQ-3	Carbon dioxide monitoring and control	The prevention and response monitoring of carbon dioxide levels; to ensure that ample quantities of outside air are delivered in the building	1	1
IEQ-4	Daylight	Recognising designs that present good levels of daylight for building occupants	3	1
IEQ-5	Daylight glare control	The reduction of glare from natural light	1	1
IEQ-6	High frequency ballasts	Avoiding low frequency flicker that is caused by fluorescent lighting, thus increasing amenity in the workplace	1	1

Ref no	Title	Aim of credit	No of points available	No of points achieved
IEQ-7	Electric lighting levels	Designing base building office lighting	1	1
IEQ-8	External views	Design that provides the occupants with a view of the external surroundings	2	2
IEQ-9	Thermal comfort	Buildings that achieve a high level of thermal comfort	2	0
IEQ-10	Individual comfort control	Designs that encourage individual control of thermal comfort	2	0
IEQ-11	Hazardous materials	Reducing health risks to occupants from the presence of hazardous materials	0	Not Applicable
IEQ-12	Internal noise levels	Design of buildings that maintain internal noise levels at an acceptable level	2	1
IEQ-13	Volatile organic compounds	Minimising levels of volatile organic compounds in the building	3	3
IEQ-14	Formaldehyde minimisation	Usage of products with low formaldehyde emission levels	1	0

Ref no	Title	Aim of credit	No of points available	No of points achieved
IEQ-15	Mould prevention	To support design of services that minimise the risk of mould growth and its negative impact on the tenants; health	1	0
IEQ-16	Tenant exhaust riser	Designing a building with a general exhaust riser that removes indoor pollutants from printing and photocopy areas	1	1
IEQ-17	Environmental tobacco smoke avoidance	Prohibiting smoking by tenants inside the building and recognising the air quality benefits	1	1
TOTAL			27	15

Source: GSSA Office v1 Tool – Aurecon, Century City

Energy

Ref no	Title	Aim of credit	No of points available	No of points achieved
Ene-1	Greenhouse gas emissions	Designs that minimise greenhouse gas emissions connected with energy consumption	20	9
Ene-2	Energy sub-metering	Ongoing management of energy consumption by installing energy sub-metering	2	2
Ene-3	Lighting power density	Design of artificial lighting with nominal energy consumption	4	4
Ene-4	Lighting zoning	Designs that promotes more flexibility for light switching, thus only areas that are occupied will be lighted	2	2
Ene-5	Peak energy demand reduction	To reduce the high demand for energy supply in peak periods	2	0
TOTAL			30	17

Source: GSSA Office v1 Tool – Aurecon, Century City

Transport

Ref no	Title	Aim of credit	No of points available	No of points achieved
Tra-1	Provision of car parking	Developments that facilitate different ways of transportation to the workplace	2	2
Tra-2	Fuel-efficient transport	Using more fuel friendly vehicles for travelling to the workplace	2	2
Tra-3	Cyclist facilities	Use of bicycles by occupants and visitors	3	3
Tra-4	Commuting mass transport	Availability of the access of public to and from the workplace	5	1
Tra-5	Local connectivity	Accessibility of community facilities in order to reduce the use of vehicles by the occupants	2	1
TOTAL			14	9

Source: GSSA Office v1 Tool – Aurecon, Century City

Water

Ref no	Title	Aim of credit	No of points available	No of points achieved
Wat-1	Occupant amenity water	Encouraging the reduction of water usage by the occupants	5	5
Wat-2	Water meters	Designing systems that monitor and manage water consumption	2	2
Wat-3	Landscape irrigation	Reducing the consumption of potable water for landscape irrigation	2	2
Wat-4	Heat rejection water	Reduction of potable water consumption that derives from heat rejection systems	4	4
Wat-5	Fire system water consumption	Minimising the consumption of potable water for the building's fire protection and necessary water storage systems	1	1
TOTAL			14	14

Source: GSSA Office v1 Tool – Aurecon, Century City

Materials

Ref no	Title	Aim of credit	No of points available	No of points achieved
Mat-1	Recycling waste storage	Availability of storage space to recycle resources used in the building	2	2
Mat-2	Building reuse	Possibility of reusing the building to minimise material consumption	0	Not applicable
Mat-3	Reused materials	Using materials that lengthen the useful life of existing materials and products	1	0
Mat-4	Shell and core integrated fit-out	Using base building delivery mechanisms to eliminate the need for tenant refits	1	1
Mat-5	Concrete	Reducing embodied energy that occurred through the use of concrete	3	0
Mat-6	Steel	Reduction of embodied energy associated with the use of virgin steel	3	3
Mat-7	PVC minimisation	Reducing usage of PVC products in South African buildings	1	1
Mat-8	Sustainable timber	Encouraging reuse of timber products	2	0

Ref no	Title	Aim of credit	No of points available	No of points achieved
Mat-9	Design for disassembly	Minimising energy and resources associated with demolition	1	0
Mat-10	Dematerialisation	Encouraging designs that reduce total number of materials	1	0
Mat-11	Local sourcing	Using products that are close to the building site and gaining environmental advantages by reducing the transport emissions	2	1
TOTAL			17	8

Source: GSSA Office v1 Tool – Aurecon, Century City

Land use & ecology

Ref no	Title	Aim of credit	No of points available	No of points achieved
Eco-1	Topsoil	Construction practices that preserve the ecological integrity of topsoil	1	0
Eco-2	Reuse of land	Reuse of land that had previously been developed and is a municipality approved urban edge	2	0
Eco-3	Reclaimed contaminated land	Developments that reclaim contaminated land that otherwise would not have been used	2	0
Eco-4	Change of ecological value	Developments that maintain or improve ecological value of their sites	4	0
TOTAL			9	0

Source: GSSA Office v1 Tool – Aurecon, Century City

Emissions

Ref no	Title	Aim of credit	No of points available	No of points achieved
Emi-1	Refrigerant/ gaseous ODP	Selecting refrigerants and other gasses that do not contribute to long-term damage of the earth's stratospheric ozone layer	1	1
Emi-2	Refrigerant GWP	Selecting refrigerants that reduce potential for global warming	2	0
Emi-3	Refrigerant leaks	Minimising leaks from refrigerators	2	2
Emi-4	Insulant ODP	Using insulants that do not contribute to the long-term damage of the earth's stratospheric ozone layer	1	1
Emi-5	Watercourse pollution	Minimising the storm water run-offs and the damage of natural watercourses	3	2
Emi-6	Discharge sewer	Minimising discharge to the municipal sewerage system	4	2
Emi-7	Light pollution	Minimising pollution into the night sky	1	1
Emi-8	Legionella	Building systems that eliminates the risk of Legionnaires' disease	1	0

Ref no	Title	Aim of credit	No of points available	No of points achieved
Emi-9	Boiler and generator emissions	Minimising the harmful emissions that boilers and generators produce	1	1
TOTAL			16	10

Source: GSSA Office v1 Tool – Aurecon, Century City

Innovation

Ref no	Title	Aim of credit	No of points available	No of points achieved
Inn-1	Innovative strategies & technologies	Contributing a broader market transformation towards sustainable development	1	1
Inn-2	Exceeding Greens Star SA benchmarks	Sustainable improvement on existing Green Star SA credit	2	2
Inn-3	Environmental design initiatives	Initiative in the project viably addresses an environmental concern outside the current scope of this Green Star SA rule	2	2
TOTAL			5	5

Source: GSSA Office v1 Tool – Aurecon, Century City