

GREEN BUILDING IN SOUTH AFRICA

GUIDE TO COSTS & TRENDS

2022 EDITION

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The Association of
South African
Quantity Surveyors



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**The Green Building Council South Africa (GBCSA),
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& The University of Pretoria (UP)**

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FOREWORD

Since its inception in 2007, the Green Building Council South Africa (GBCSA) has successfully certified over 800 green buildings using the Green Star SA rating system. One of the major hurdles to adopting green building best practices and certification is the perceived additional cost premium when compared to a conventional building.

In 2014, in order to address this concern the GBCSA, the Association of South African Quantity Surveyors (ASAQS) and the University of Pretoria (UP) established a research study with the aim to quantify the cost premium associated with green buildings and identify trends in costs associated with the construction of green buildings in South Africa.

Through the publishing of this resource, we intend to equip our members and the sector at large with thorough data led research that is relevant, useful and insightful to validate the wider adoption of green building certification.

Much has shifted since the first release of this flagship study with COVID 19 having a negative impact on the economy, construction and property sector, including the associated costs of buildings. On the positive side, the pandemic has resulted in an increase in Environmental, Social and Governance (ESG) reporting and the adoption of sustainability measures with a direct impact on the property sector, accelerating the shift towards net zero targets.

This study aims to dispel the myth that green buildings cost more to build. Now in its 3rd edition and spanning over 5 years of in depth research by the UP and supported by the ASAQS the study focusses on new office buildings certified by the GBCSA using the Green Star office tool. This tool is an asset level certification tool i.e. it is a once off certification done at both design and as-built Green Star New Build Office v1 and v1.1 tool (optional) stage and is applied in the property sector by green building and sustainability consultants who aim to assist the client with the certification process as well as advising them on green building best practice. The clients submission to the GBCSA is then independently verified resulting in a credible certification that allows the market to understand how green is green and who says it is green?

This study unpacks, “what the green building penetration is”, within this building typology as well as, “what the green building cost premium is”. By using the bills of quantities for the certified buildings to unpack these two aspects, the study produces robust and useful results for the industry that clearly demonstrate a reduction in cost premiums as efficient technologies come down in price and are more widely adopted.

This booklet is a valuable resource in that it clearly communicates the cost benefits to clients when pursuing Green Star certified buildings, while at the same time promoting the adoption of net zero buildings.

As Green Star certified buildings become increasingly attractive to clients because of lower capital cost premiums and higher long-term returns, their adoption and proliferation also contribute to the achievement of the global net zero carbon emissions target by 2050.

South Africa will need to set more ambitious nearer term emissions targets in order to play an equitable role in limiting global temperature increases to well below 2°C, and preferably to below 1.5°C – as per the Paris Agreement’s targets. Accounting for >15% of the country’s greenhouse gas (GHG) inventory, buildings are a key part of South Africa’s decarbonisation strategy; building emissions will need to decrease by 34% in relation to the International Energy Agency’s Reference Technology Scenario by 2050 (or by 82% below current emissions) if South Africa is to align itself to a 2°C scenario – i.e. most buildings will need to be at or near to net zero carbon (NZC) in order to align with the Intergovernmental Panel on Climate Change (IPCC).

2016

2009-2014

The first edition of the Green Building in South Africa – Guide to Costs & Trends. (hereinafter referred to as the 2016 report). Before this report, no data existed to unpack the perception that green building attracts a significant cost premium when compared to the cost of non-green/ conventional buildings. Access report [here](#).

2019

2015-2018

This edition confirmed previous outcomes as well as the previous conclusions reached. It additionally provided analysis to support the business case of green building. (hereinafter referred to as the 2019 report). Access report [here](#).

2022

2019-2021

This current edition has continued with the analysis of the previous releases and provides deeper insights into various aspects of the analysis, made possible through the growing maturity and adoption of green building certification in the industry. (hereinafter referred to as the 2022 report).

TAKE NOTE

The purpose of the Cost of Green study is to describe the actual costs and trends of Green building in South Africa in a credible, unbiased, consistent and user-friendly manner. The study findings are based on actual case studies of office buildings that were awarded with a Green Star certification.

Assumptions and/or qualifications have been made for the purpose of this study, therefore use the findings of this study with due caution and discretion.

The study includes all South African office buildings certified by the GBCSA, which meet the following criteria:

- Are 4, 5 or 6 Star Green Star certified buildings
- Have either “Design” and/or “As Built” ratings
- Used the Green Star SA Office v1/v1.1 rating tool

The study is therefore representative of certified new office buildings only.

The cost data used in the report has not been normalised to allow for differences in typology and or specification level required by the specific grade of office space provided (i.e. Premium grade, A grade, B grade, etc.) other than to evaluate the effect of base building cost on green cost premiums.

The design methodology of the study used estimated costs based on elemental estimates for projects with “Design” Green Star certification and final cost for projects with “As Built” Green Star certification. The actual cost data available did not always allow for this methodology. (i.e. only final cost data may have been available for a project with “Design” certification). However this deviation is not considered to be of significance as all study projects with both estimated and final cost available indicated only very minor/insignificant differences between the estimated and final cost.

TAKE NOTE continued

The approval of owners was secured before the financial details of their buildings were included in this study.

The SANS 10400 XA 2021 ed. 2 and or SANS 10400XA: 2011 national building code for energy efficiency in new buildings were not specifically considered in the report.

The 2022 report included a sample of 170 office buildings owned by 100 different companies.

About Green Star SA:

Originally adopted from Australia, the Green Star rating system has been used in South Africa for over 12 years and has been heavily contextualised for the South African market and climate. Each tool offers a flexible framework with robust strategies to certify green buildings in South Africa and each building goes through an independent verification process that validates the environmental initiatives. The tool for new buildings and major refurbishments is an asset rating i.e. a once off rating achieved at the design (tender) stage and or at the as-built stage (based on a minimum of 12months of data). The tool that has been used as the basis for this study is the Green Star SA office V1 and V1.1 tool.

TAKE NOTE continued

The role of the Green Star SA tools is to guide an in depth and holistic approach to green buildings by factoring in all of the critical elements that work together to create the best building possible by.

- Ensuring new buildings are designed to operate at future global best practice.
- Reducing the environmental impact of a building by reducing their contribution to global climate change, increasing biodiversity, driving water and electricity efficiencies.
- Enhance and better human health by creating places and spaces that promote health and wellbeing while reducing use of toxic materials and promoting good indoor air quality.

- Allow different designs to have their environmental initiatives fairly benchmarked, rewarded and appreciated.
- Encourage the implementation of new and emerging technologies that result in better performing buildings;

Green Star SA New Buildings & Major Refurbishments tools allow for 2 certifications based on timelines typically applied to the development of buildings.

1. Design: Based on tenders drawings & specifications; this rating essentially verifies the building is designed to certain specifications and performance standards.
2. As Built: Based on as-built drawings and commissioning records; this asset rating essentially verifies the as-built building is performing as designed.

TAKE NOTE continued

Buildings certified with the Green Star SA New Buildings & Major Refurbishments tool are rewarded as below:



- 4 Stars: “Best Practice”
- 5 Stars: “South African Excellence”
- 6 Stars: “World Leadership”



THE STUDY

The Cost of Green study analysis of cost data and presentation of the findings is based on the ASAQS's "Guide to Elemental Cost Estimating 2016" and the GBCSA's "Green Star Office v1/v1.1" rating tool.

The study reports on two primary aspects of green building cost:

PART 1: GREEN DESIGN PENETRATION

This indicates the extent to which the "Green Star SA Office v1/v1.1" rating tool has introduced green design into the different elements of a project, expressed as a percentage (%) of total project cost.

For example a penetration factor of 45% would indicate that green design has been integrated into 45% of the total project budget.

PART 2: GREEN COST PREMIUM

The green cost premium is defined as the additional cost of green building over and above the cost of conventional construction, expressed as a % of the total cost of the project.

For example, a green building project which costs R100 million in total and includes green building costs of R3 million over and above the cost of conventional construction, is considered to have a green cost premium of $R3m/R100m \times 100/1 \% = 3 \%$.

To describe green building cost in more detail, the green cost premium is analysed in terms of the following:

Certification level

Evaluating green building costs in terms of the three different certification levels i.e. 4 Star, 5 Star, or 6 Star Green Star certification.

Location

Evaluating the effect of location on green building costs. Building costs often vary between different provinces in South Africa.

Construction area

Evaluating the effect of the size of a building on the green building cost premium (GBCP). Larger projects often attract more competitive building rates compared to smaller projects, due to economies of scale. Larger construction companies may achieve higher levels of efficiency/productivity. However, mega projects (i.e. major sport stadiums or power stations) warrant specialized construction

and services and may restrict effective competition which in turn may result in higher building costs.

Base building cost

Evaluating the effect of base building cost (R/m²) on GBCP. A project with a higher base building cost can more easily afford additional green design items and can expect to have a lower GBCP. However, a project with a low base building cost will often have to add extra cost items to the bottom line and can therefore, expect to have a higher green cost premium. The study evaluated the effect of base building cost on the GBCP.

Vertical façade ratio

Evaluating the effect of the vertical façade: construction area ratio on the GBCP. The interaction between a building and the physical environment takes place to a large degree via the vertical façade of the building. Therefore, the vertical

THE STUDY continued

façade area is closely associated with green building design. The study evaluated the effect of façade: construction area ratio on the GBCP.

Certification date

Evaluating the effect of time/maturity of the green industry on the GBCP. Green building certification introduced new concepts to the construction industry. Over time, the risks associated with adopting new green concepts are reducing; replaced by greater certainty of green design and costs related thereto, indicating a maturing of the green building industry.

Tenant mix

Evaluating the effect of single corporate vs generic tenant mix on the GBCP. The majority of the office buildings certified by the GBCSA during 2009 - 2013 were buildings designed for single, corporate tenants. Corporate clients

tend to place high value on marketing and public image and therefore be inclined to spend more on buildings. The study evaluated the effect of tenant mix on GBCP.

Certification rating

The Green Star Office v1/v1.1 tool allows for “Design” and “As Built” Green Star certification rating. The study evaluated the effect of the certification level on the GBCP.

Rating tool categories

Evaluating the GBCP in terms of the categories of the Green Star Office v1/v1.1 tool. The Green Star Office v1/v1.1 tool consists of nine different categories and a total of 69 credits. The tool therefore offers many design alternatives when pursuing Green Star certification. The study evaluated the portion of the GBCP spent on each of the categories of the Green Star rating tool.

SAMPLE PROFILE

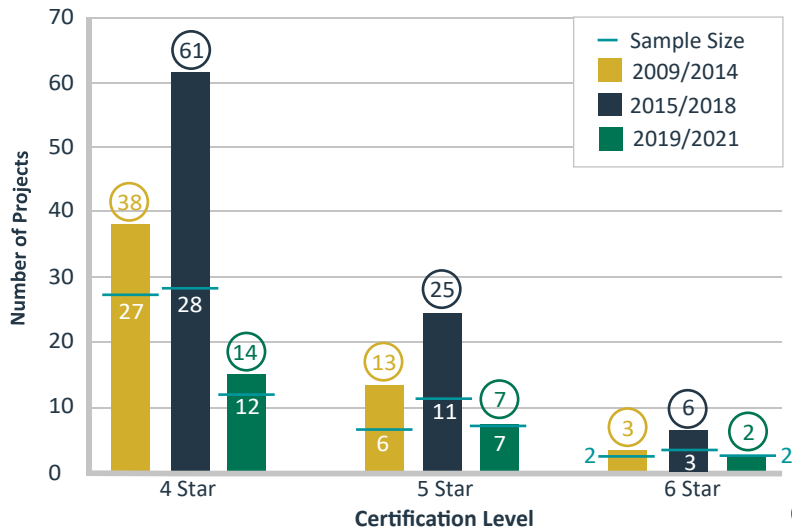
The profile of the combined study population size of 170 projects provides context for the study results that follow. The study population size consists of:

- 54 projects (31,8 %) certified from 2009 – 2014.
- 93 projects (54,7 %) certified from 2015 – 2018.
- 23 projects (13,5%) certified from 2019 – 2021.

These projects are certified as follows:

- 114 projects (67,1 %) have a 4 Star Green Star.
- 45 projects (26,5 %) have a 5 Star Green Star certification.
- 11 projects (6,5 %) have a 6 Star Green Star certification.

FIGURE 1: SAMPLE SIZE & CERTIFICATION ACHIEVED

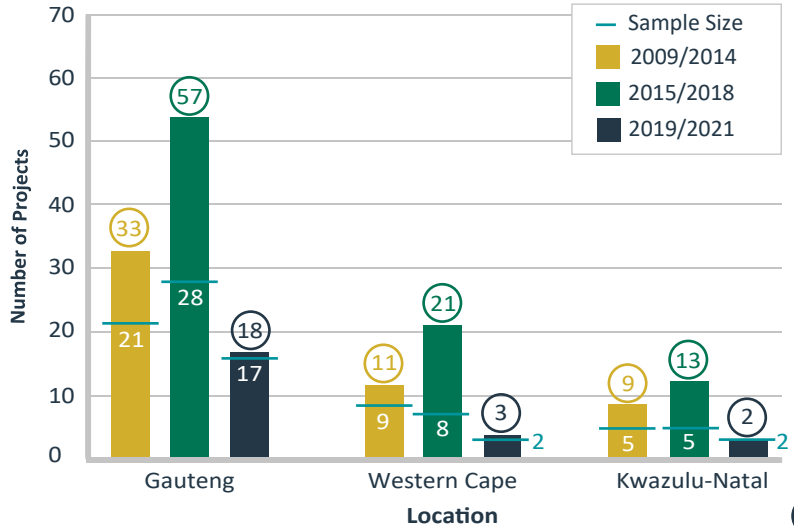


SAMPLE PROFILE continued

Of all certified office projects in the study population size a total of:

- 108 office projects (63,5 %) are located in Gauteng with
- 35 office projects (20,6 %) from the Western Cape and
- 24 office projects (14,1 %) from Kwazulu-Natal.

FIGURE 2: PROJECT LOCATION

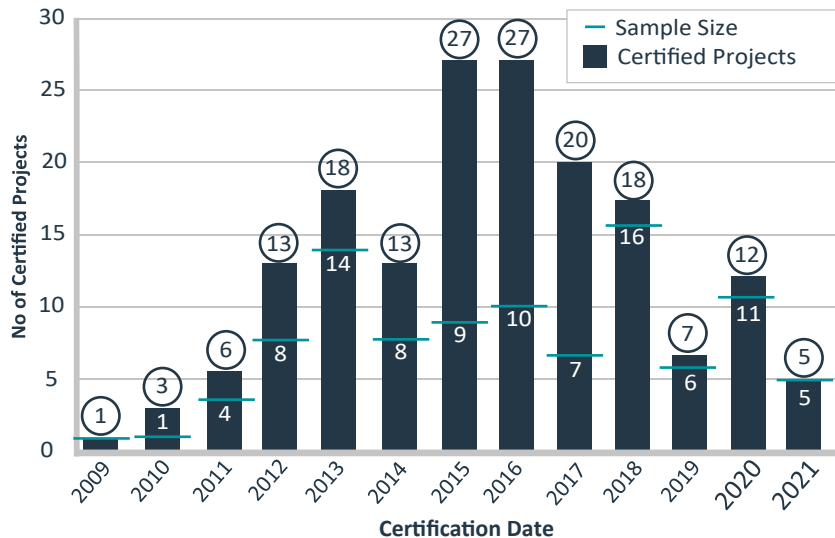


SAMPLE PROFILE continued

The number of office projects certified per year clearly indicates the substantial and sustained growth in green building in South Africa since 2009.

The slow-down in growth noticeable from 2016 – 2021 is largely due to the severely challenging business conditions experienced by the South African economy and specifically the construction industry during recent years.

FIGURE 3: CERTIFICATION PER YEAR (OFFICE)





STUDY RESULTS

PART 1: GREEN DESIGN PENETRATION

The study revealed that the application of the Green Star Office v1/v1.1 tool resulted in the introduction of green design elements accounting for an average of 41,0% of the budgets of projects included in the sample (42,4% in the 2019 report).

For some projects more than 80% of the budget included green design elements. No clear correlation was apparent between the different rating levels and the green design penetration achieved.

TABLE 1: GREEN DESIGN PENETRATION - RATING ACHIEVED

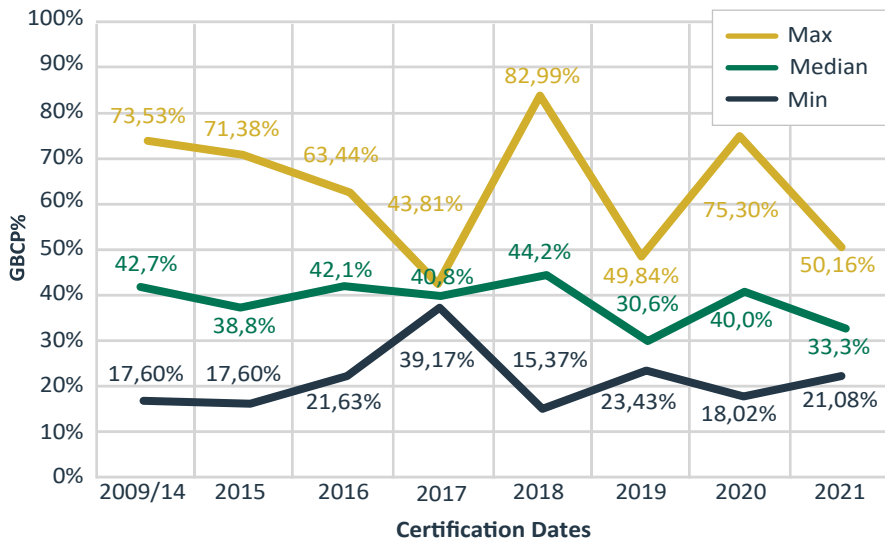
Rating achieved- Green design penetration (%)	MIN	AVERAGE	MAX
TOTAL	15,4%	41,0%	83,0%
4 Star	15,4%	41,6%	81,0%
5 Star	18,0%	41,1%	83,0%
6 Star	15,8%	36,5%	45,9%

The average green design penetration of projects are trending lower since 2019 to between 30% and 40%. This trend may indicate toward a more efficient and mature green building industry. The finding may also confirm that the Green Star tool may be in need of updating to reflect the increasing industry efficiency levels (see Table 2 and Figure 4).

TABLE 2: GREEN DESIGN PENETRATION - PUBLICATION DATE

Publication date- Green design penetration (%)	MIN	AVERAGE	MAX
TOTAL	15,4%	41,0%	83,0%
2009/14	17,6%	42,7%	73,5%
2015/18	15,4%	42,1%	83,0%
2019	23,4%	30,6%	49,8%
2020	18,0%	40,0%	75,3%
2021	21,1%	33,3%	50,2%

FIGURE 4: GREEN DESIGN PENETRATION - CERTIFICATION DATE





STUDY RESULTS

PART 2: GREEN COST PREMIUM

The total average green building cost premium achieved by the projects sampled (as expressed by the median*) has reduced from 5,95 % in the 2016 report to 3,63 % in this report.

The average green cost premium of office projects certified in the period 2019 – 2021 has positively decreased from 3,9 % for the previous period 2009 – 2018 to 3,15 %.

NOTE: The choice of indicator for the central tendency of the data (to describe the average green building cost premium) was the median. The median is the midpoint of a frequency distribution or the numerical centre of a set of data. Since the data sample was right skewed (0,942), the median was chosen as the preferred indicator over the arithmetic mean as it is less sensitive to skewed data.

TABLE 3: GREEN COST PREMIUM- DATA PER PUBLICATION DATE

Publication date- Green design penetration (%)	MIN	AVERAGE	MAX
TOTAL	0,47%	3,63%	14,24%
2009/14	1,14%	5,95%	14,24%
2015/18	1,14%	3,49%	12,01%
2019/21	0,47%	3,15%	10,83%

FIGURE 5: GREEN BUILDING COST PREMIUM

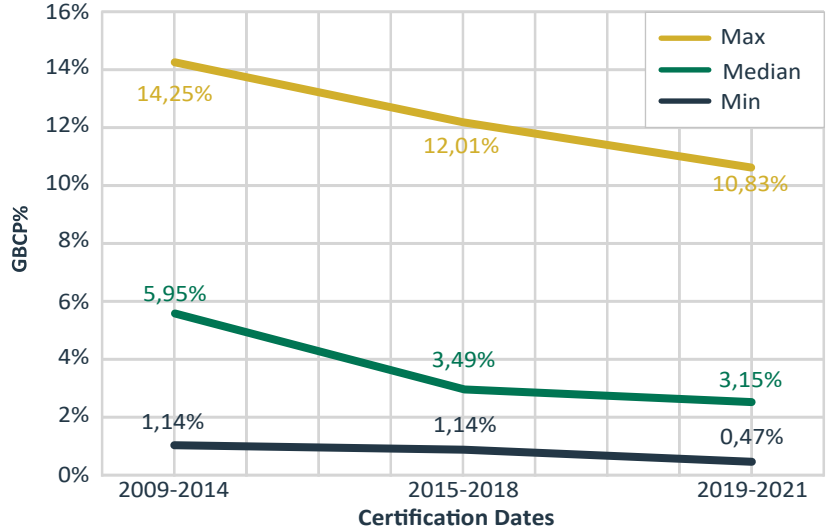


Figure 6 details the spread of the green building cost premiums analyses in sequential categories of 1,0% across the range from 0,47% to 14,24%.

The largest concentration of 26% of the projects occurred in the green building cost premiums category of 3,0% - 4,0%.

The green building cost categories from 1,0% - 6,0% account for 71% of all the projects.

FIGURE 6: GREEN COST PREMIUM - DISPERSION ACROSS THE RANGE

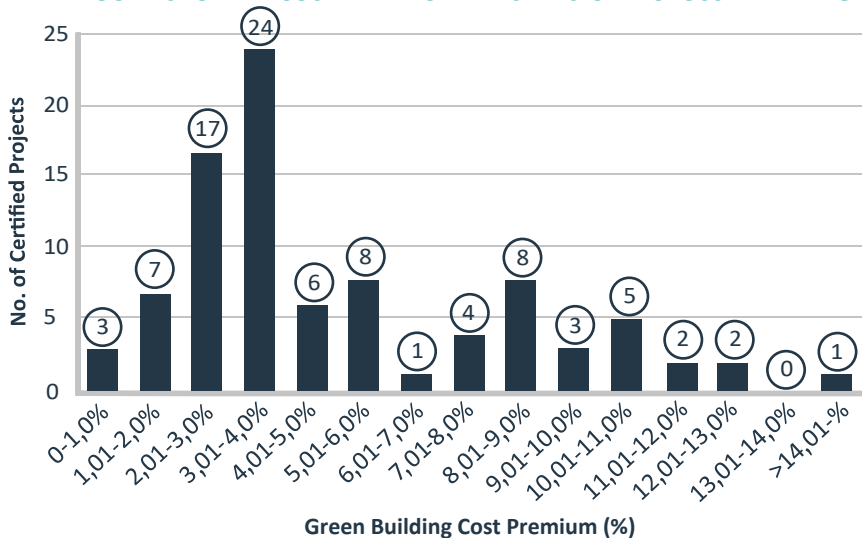


Figure 7 details the spread of the green building cost premiums analyses against time as published in 2016 (2009/14 data); in 2019 (2015/18 data) and 2022 (2019/21 data).

This detail confirms that the spread of the green building cost premium narrowed during the more recent past and also decreased in size.

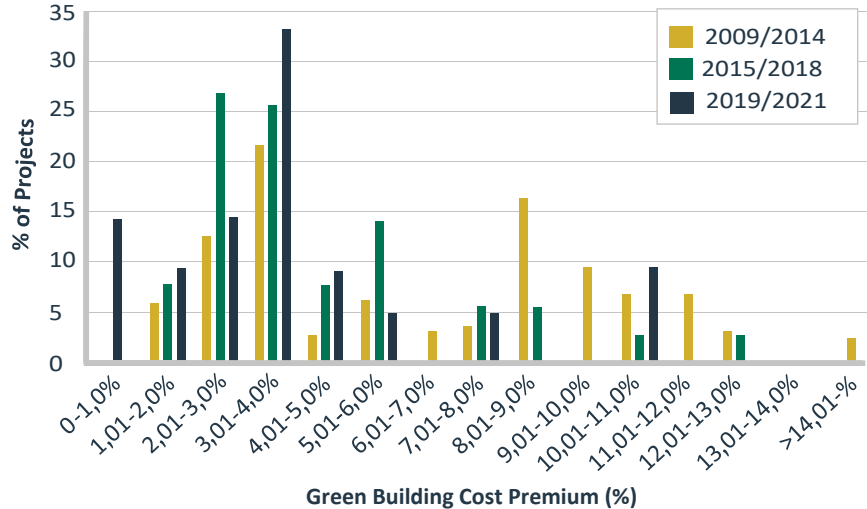


Figure 8 details the spread of the green building cost premiums expressed in monetary terms escalated to December 2021. The lowest premium was just less than R2,0m while the highest premium exceeded 100,0m.

Although the escalated amounts of the green building cost premiums are very widely dispersed, this detail does confirm that 58% of the projects reported a green cost premium of less than R15,0m.

As the size of buildings in the study sample differ significantly, the green building cost premium normalised for R/m² will provide a very insightful perspective on the green building cost premiums achieved.

FIGURE 8: COST PREMIUM IN ESCALATED MONETARY TERMS

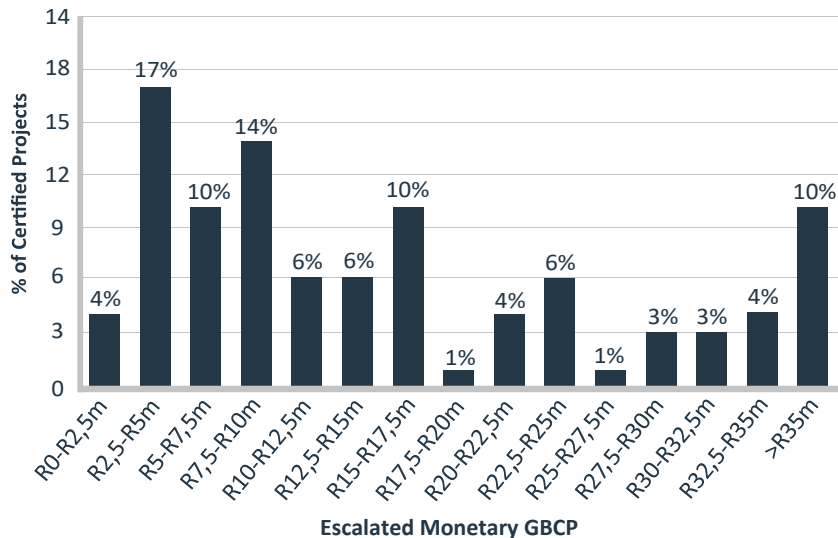
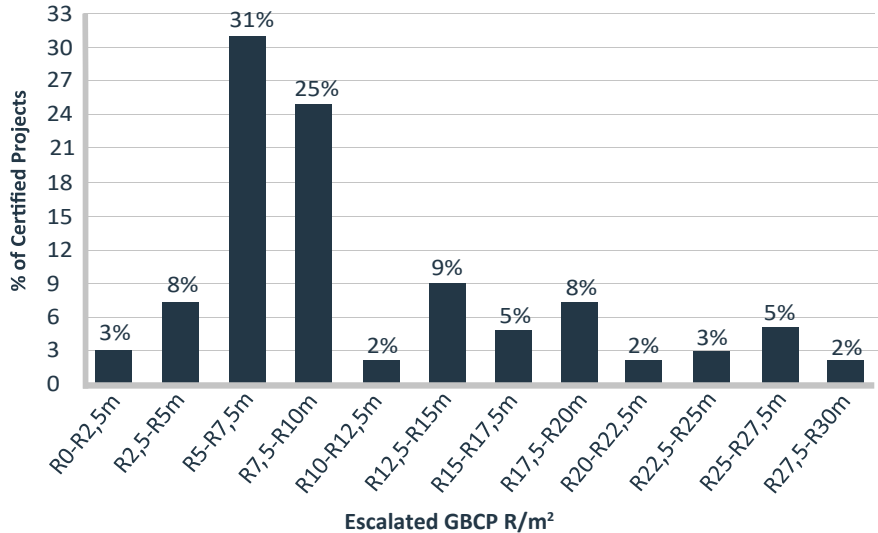


Figure 9 details the spread of the green building cost premiums expressed in R/m² escalated to December 2021.

The green building cost premiums varied from R271/m² to R3,572/m². The escalated green building cost premiums are very widely dispersed, but this detail confirms that 64% of the projects reported a green cost premium of between R250/m² and R1,250/m².

FIGURE 9: ESCALATED R/m²



The average green building cost premium was 3,63 % of the total project cost. The lowest cost premium reported was 0,47% and the highest was 14,24 %. Both Table 4 and Figure 10 indicate the positive correlation between green cost premium and star rating achieved.

TABLE 4: GREEN COST PREMIUM - RATING ACHIEVED

Rating achieved- Green cost premium (%)	MIN	AVERAGE	MAX
TOTAL	0,47%	3,63%	14,24%
4 Star	0,47%	3,55%	14,24%
5 Star	1,33%	3,49%	11,73%
6 Star	8,60%	10,50%	11,70%

FIGURE 10: GREEN COST PREMIUM - RATING ACHIEVED



The average green cost premium of 5,24 % for projects in KZN was about 50% higher when compared to the projects from other locations.

TABLE 5: GREEN COST PREMIUM- LOCATION

Location- Green cost premium (%)	MIN	AVERAGE	MAX
TOTAL	0,47%	3,63%	14,24%
GAUTENG	0,47%	3,53%	10,72%
WESTERN CAPE	0,49%	3,44%	14,24%
KWAZULU- NATAL	3,15%	5,24%	8,72%

Both Table 6 as well as Figure 11 confirm the strong negative correlation between green cost premium and construction size.

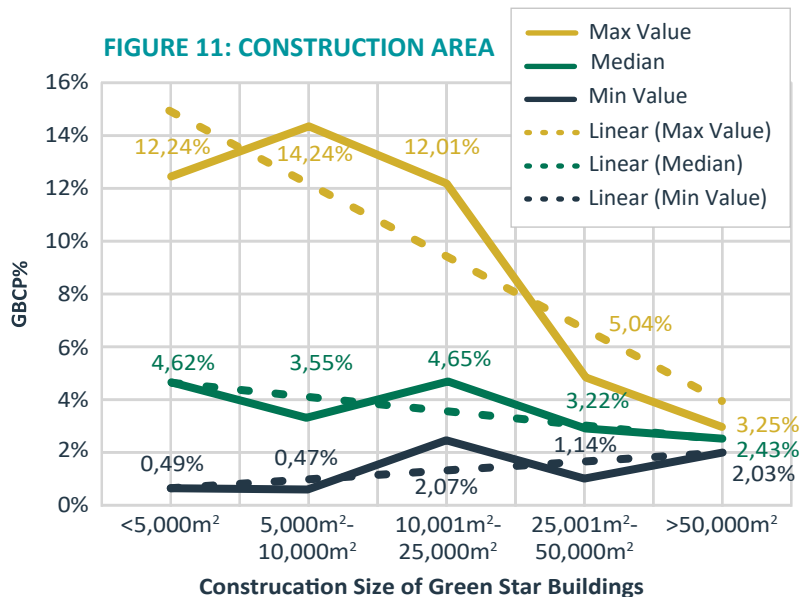
TABLE 6: GREEN COST PREMIUM- CONSTRUCTION AREA

Construction area- Green cost premium (%)	MIN	AVERAGE	MAX
TOTAL	1.47%	3,63%	14,24%
<5,000m ²	0,49%	4,62%	12,24%
<10,000m ²	0,47%	3,55%	14,24%
<25,000m ²	2,70%	4,65%	12,01%
<50,000m ²	1,14%	3,22%	5,04%
>50,000m ²	2,03%	2,43%	2,50%

STUDY RESULTS

The strong negative correlation for the 2009/14 data ($r = -0,915$) and the 2015/18 data ($r = -0,906$) between green cost premium and construction size of office buildings was confirmed by the overall 2009/21 data ($r = -0,843$).

The data confirmed that the cost premium for buildings smaller than 5,000m² which reduced from 9,3% (2009/14) to 4,6 % (2015/18) has remained at 4,62% (2009/21).



The base building cost has been calculated as the total project cost minus the basement cost divided by the building construction area minus the basement area. To allow for the time value of money, all costs were escalated to December 2021. The base building cost of the project sample ranged from R11,175/m² to R35,796/m² with an average cost of R18,063/m². To evaluate the relationship between base building cost and green cost premium, the base building cost range was split into five categories that are spread evenly around the average cost.

TABLE 7: GREEN COST PREMIUM - BASE BUILDING COST (AT 12/2021)

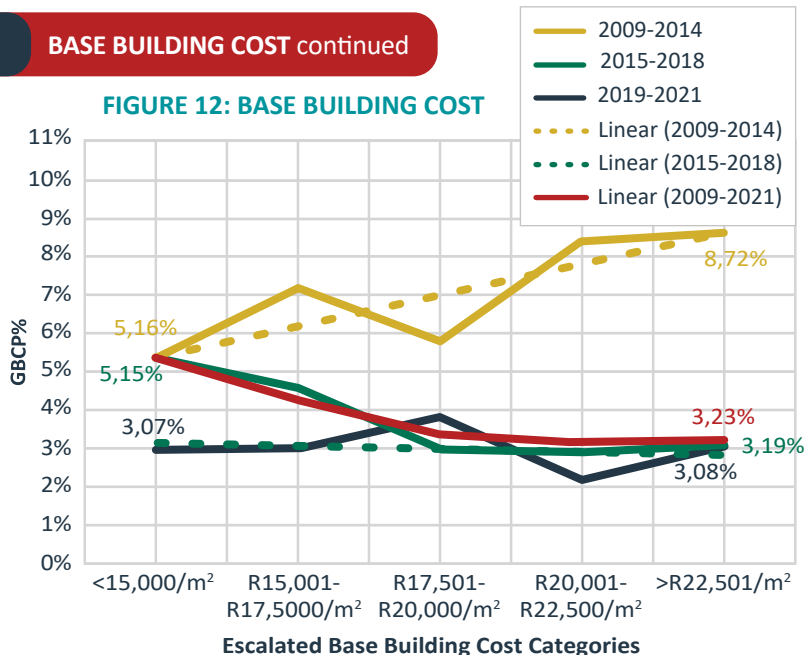
Base building cost (R/m ²)- Green cost premium (%)	MIN	AVERAGE	MAX
<R15,000/m ²	0,80%	5,15%	10,50%
R15,001-R17,500/m ²	1,14%	4,30%	11,73%
R17,501-R20,000/m ²	1,14%	3,41%	9,84%
R20,001-R22,500/m ²	0,47%	3,19%	10,02%
>R22,501/m ²	0,49%	3,19%	12,24%

The base building cost categories are –

- much lower (<R15,000/m²),
- lower (R15,001 - R17,500/m²)
- similar (R17,501 - R20,000/m²)
- higher (R20,001 - R22,500/m²)
- or much higher (> R22,501/m²) than the average base building cost.

The combined 2009/21 data confirmed a negative relationship between base building cost and green cost premium ($r = -0,812$).

Contrary to expectation the early data 2009/14 was positively correlated ($r = 0,828$) while the 2019/21 data indicated very little correlation ($r = -0,059$) (see Table 7 and Figure 12).



The ratio of vertical façade: construction area of the sample projects varied from 0,18:1 to 0,90:1 with an average of 0,44:1.

To evaluate the relationship between façade ratio and green cost premium, the façade ratio range was split into five categories that are all defined in relation to the average ratio. The categories are;

- much lower (<0,34:1),
- lower (0,34 – 0,40:1),
- average (0,41 – 0,47:1),
- higher (0,48– 0,54:1) or
- much higher (> 0,54:1) than the average ratio.

TABLE 8: GREEN COST PREMIUM - VERTICAL FAÇADE RATIO

Vertical façade ratio- Green cost premium (%)	MIN	AVERAGE	MAX
Much ↓ than average (<0,34:1)	2,70%	3,78%	11,70%
↓ than average (0,34-0,40)	1,52%	3,63%	8,60%
Average (0,41-0,47:1)	1,14%	3,44%	10,83%
↑ than average (0,48-0,54:1)	0,49%	3,61%	11,73%
Much ↑ than average (>0,54:1)	0,47%	4,96%	12,24%

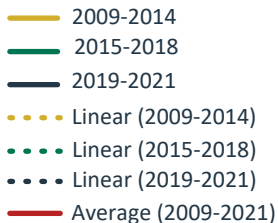
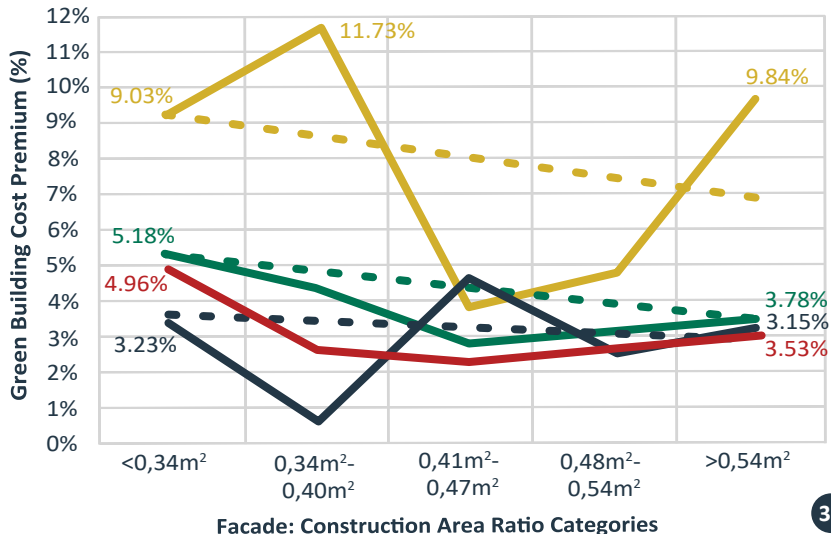


Table 8 and Figure 13 indicate the correlation between vertical façade ratio and green cost premium. The overall 2009/2021 data revealed a reasonable positive correlation with the façade ratio ($r = 0,732$). This trend has weakened with time but still indicates that buildings with an above average vertical façade: construction area ratio also tend to have a higher green cost premium.

FIGURE 13: VERTICAL FAÇADE RATIO



The 2016 and 2019 reports suggested a maturing of the South African green industry with a gradual decline in average green cost premium between 2010 - 2018. The 2022 report confirms that the green cost premium is still declining as the green industry matures ($r = -0,572$). Table 9 and Figure 14 indicate as a general trend that since 2011 the average green cost premiums have been declining.

TABLE 9: GREEN COST PREMIUM - CERTIFICATION DATE

Certification Date - GCP (%)	MIN	AVERAGE	MAX
2010	3,63%	3,63%	3,63%
2011	6,75%	8,30%	11,73%
2021	2,70%	8,72%	12,24%
2013	1,78%	3,55%	14,24%
2014	1,14%	5,15%	10,18%
2015	2,03%	4,17%	8,07%
2016	1,14%	3,15%	8,60%
2017	2,31%	3,15%	8,60%
2018	1,76%	3,88%	12,01%
2019	2,14%	4,18%	10,50%
2020	0,47%	3,15%	10,83%
2021	1,33%	3,12%	3,42%

FIGURE 14: GREEN COST PREMIUM - CERTIFICATION DATE

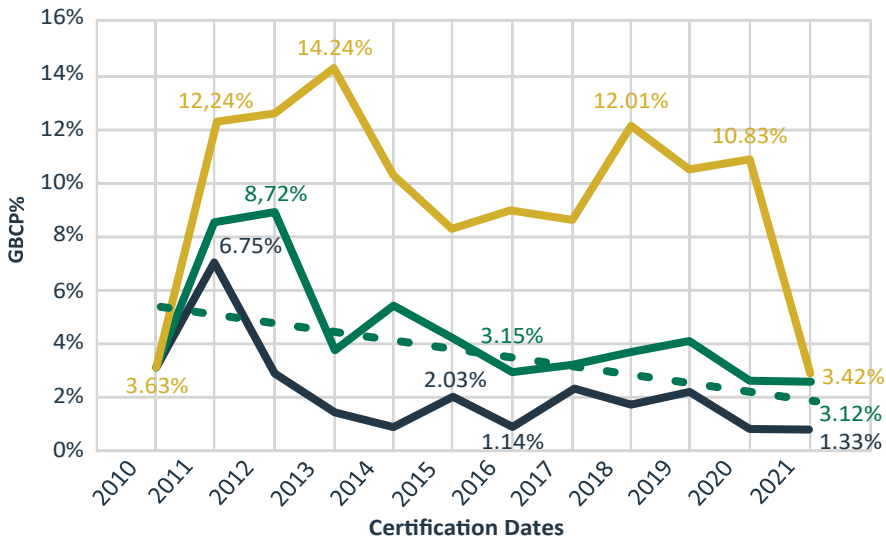


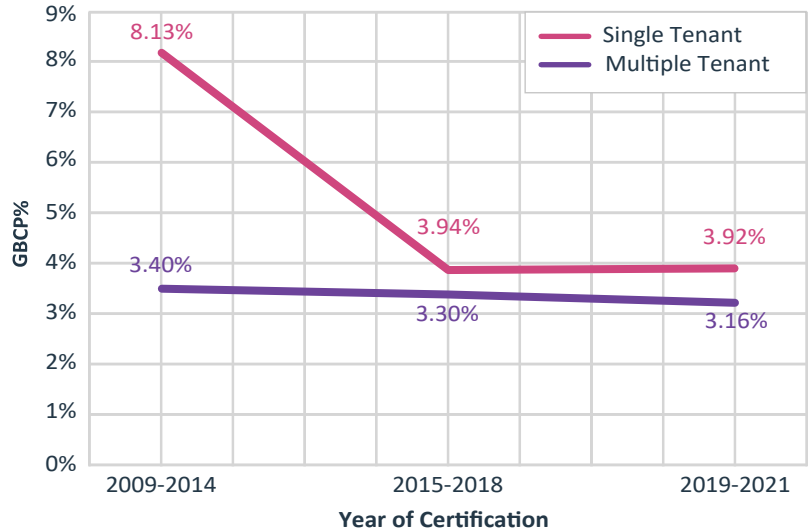
Table 10 and Figure 15 confirm that projects with a single corporate client, will on average have a higher green cost premium compared to projects with a multiple tenant mix.

The gap between the green cost premium of single tenanted buildings vs multiple tenant buildings did however narrow dramatically from 4,73 % for the 2009/14 projects to 0,63 % for the 2015/18 projects and 0,76% for the 2019/21 projects.

TABLE 10: GREEN COST PREMIUM - TENANT MIX

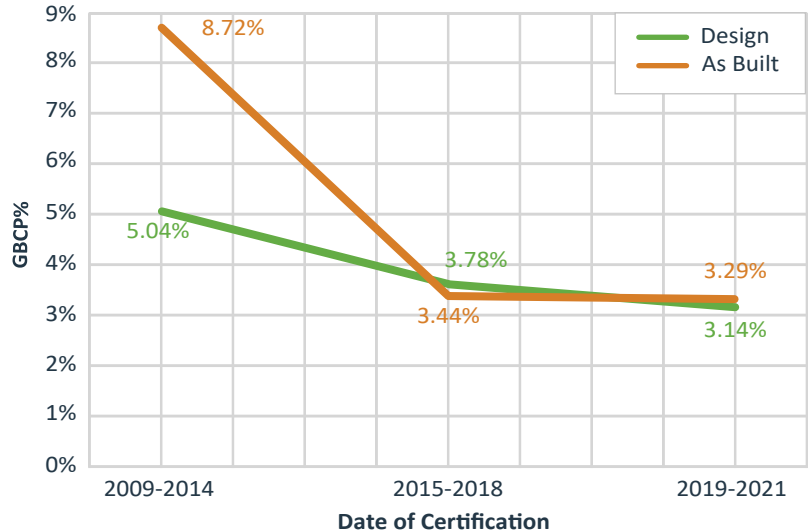
Tenant mix- Green cost premium (%)	MIN	AVERAGE	MAX
TOTAL	0,47%	3,63%	14,24%
Single Corporate	0,49%	4,89%	14,24%
Multiple Tenants	0,47%	3,23%	12,01%

FIGURE 15: GREEN COST PREMIUM - TENANT MIX



Evaluating the “Design” versus the “As Built” Green Star certification rating achieved by the sample projects, revealed that during the early years of 2009/14 projects with a “Design” certification rating had a much lower average green cost premium than projects with an “As Built” certification rating. However the 2015/21 projects indicated very similar average green building cost premiums for both “Design” and “As Built” certification ratings.

- 2009 – 2014 projects: 5,04 % vs 8,72 %
- 2015 – 2018 projects: 3,78 % vs 3,44 %
- 2019 - 2021 projects: 3,14% vs 3,29%

FIGURE 16: GREEN COST PREMIUM - CERTIFICATION RATING

The allocation of the green cost premium to the nine categories of Green Star Office v1 tool revealed that almost 59 % of the total green cost premium was allocated to only two categories namely, Energy and Indoor Environment Quality. It is notable that the five categories comprising Energy, Indoor Environment Quality, Management, Materials and Water, made up for more than 89 % of the total green cost premium allocation (see Table 11 and Figure 17).

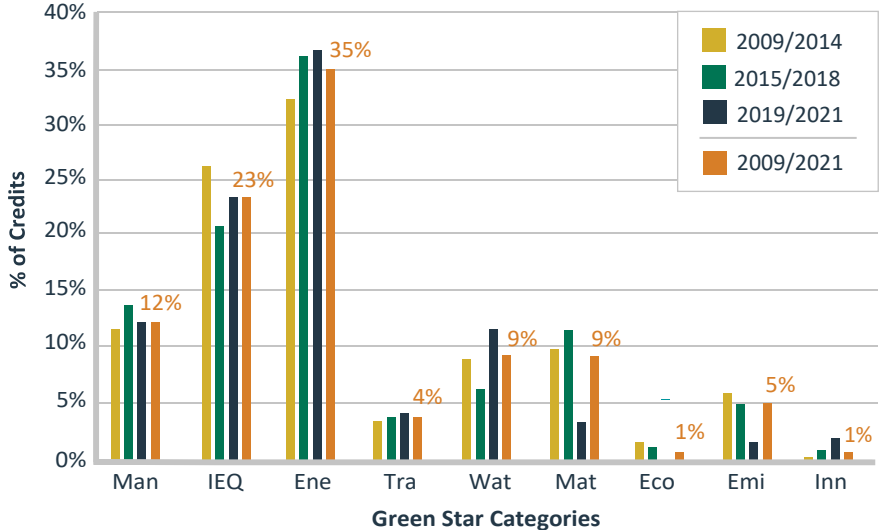
TABLE 11: GREEN COST PREMIUM - RATING TOOL CATEGORIES

Rating Tool Categories	Green Cost Premium Allocation (%)
Management	12,0
Indoor Environment Quality	23,6
Energy	35,0
Transport	3,7
Water	9,2
Materials	9,6
Land use & Ecology	1,0
Emissions	4,8
Innovation	1,2

Key

- Man: Management
- IEQ: Indoor environmental Quality
- Ene: Energy
- Tra: Transport
- Wat: Water
- Mat: Materials
- Eco: Ecology
- Emi: Emissions
- Inn: Innovation

FIGURE 17: GREEN COST PREMIUM - RATING TOOL CATEGORIES



CONCLUSION

- Green building in South Africa has matured significantly since 2009.
- Office buildings of all sizes have successfully applied for Green Star certification.
- Green Star certified buildings are still currently located predominantly in Gauteng, the Western Cape and the Durban/ Umhlanga area of Kwazulu-Natal.
- The total average green cost premium over and above the cost of non-green buildings is 3,63 % for the cumulative period 2009/21 compared with 5,2 % for the previous period 2009/14 and 3,90% for the 2015/18 period. This is supported by a positive reduction in the average green cost premium to 3,15 % for the 2019/21 period.
- Since 2015, generic office buildings that have been developed for a multi-tenant mix, make up for 73 % of all Green Star certified buildings.
- Pursuing Green Star certification through the Green Star Office v1/v1.1 tool, has resulted in an average green design penetration of 41,0 % of the total project budget.
- Higher levels of certification (4 Star vs 5 Star vs 6 Star) has resulted in a progressive increase in the green cost premium.
- The green cost premium appears to be progressively diminishing over time, largely as a result of a growing maturity in the green industry.
- Compared to smaller office buildings, large office buildings generally achieved Green Star certification with lower green cost premiums.

CONCLUSION continued

- Office buildings with higher vertical façade: construction area ratios tended to have higher green cost premiums.
- Office buildings that were developed for single corporate tenants had initially attracted higher green cost premiums compared to buildings developed for a multi-tenant mix. Since 2015 this gap has narrowed to less than 1,0%.
- Originally, office buildings with higher base building costs did not necessarily achieve lower green cost premiums, but more recently such buildings seem to be achieving lower green cost premiums.

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**The Association of South African
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Mr Karl Trusler

PARTICIPATING COMPANIES

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- Abland Property Developers
- Absa Bank Ltd
- Alchemy Property Development
- Attacq
- Atterbury Property
- Barrow Properties
- Capitalgro (Pty) Ltd
- Chevron South Africa (Pty) Ltd
- Cinzaco 128 (Pty) Ltd
- Citadel Investment Services
- City of Cape Town
- Department of Environmental Affairs
- Department of Public Works
- Dipalopalo Concessions (Pty) Ltd
- Equites Property Fund
- Eris Property Group

Property Owners and Developers

- First National Bank
- GEMS (Government Employers Medical Scheme)
- Growthpoint Properties Limited
- Ingenuity Property Investments Ltd
- Intaprop Property Development and Investment
- KZN Department of Basic Education
- Legaro Property Development
- Liberty Group Limited
- Menlyn Maine Investment Holdings
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- LDM FM
- LMC Green Consulting
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- Silito
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- Terramanzi
- WSP





MSCI
SUPPLEMENT

EXTRACTS FROM
INSIGHTS FOR PERFORMANCE

MSCI SOUTH AFRICA GREEN ANNUAL PROPERTY INDEX 2021

MAY 19, 2022

COURTESY OF MSCI

Annually MSCI South Africa releases the Green Property Index that continues to support the investment case for green buildings in the South African commercial property sector. The index showed that the investment performance of certified green, Prime, and A-grade offices improved in 2021 and outperformed non-certified assets of a similar quality by 170bps during the year.

Now in its sixth year, the MSCI SA Green Annual Property Index provides an independent and consistent comparative return on investment for green-certified and non-certified offices. Released in April 2022 the index provides an independent, globally consistent view on the investment performance of green-certified and non-certified offices.

At the end of 2021, the index sample comprised 303 prime and A-grade office properties valued at R59.1 billion of which 153 were green-certified buildings. These were

compared to 150 non-certified offices of a similar quality. The MSCI index results reflect the business case for green-rated buildings. Not only are these buildings more efficient, reducing the cost of occupancy for tenants, but they also provide a healthier environment for occupants, which is particularly relevant as staff return to their offices. The fact that green buildings achieve better returns shows that tenants are recognising these benefits.

Green offices outperformed by 19.1% since 2016

For the year ended December 2021, the green-certified office sample delivered a total return of 2.2%, 170bps above the non-certified sample's return of 0.5%. This was a similar outperformance to that measured in 2020 and takes the cumulative total return of green-certified offices to 45.2% since the inception of the index six years ago. Over this period, green certified offices outperformed the non-certified sample by 19.1% – an annualised

outperformance of 260bps. A key reason behind the strong performance of green certified offices is its comparatively high income return despite a 29% higher capital value per square metre. This was achieved courtesy of a 30% higher net operating income (NOI) per square meter compared to non-certified office buildings again reinforcing the importance blue chip occupiers are placing on green office accommodation.

Green office cashflows deemed lower risk

Green certified offices boasted significantly lower per square meter usage of electricity (-11.6%) and water (-20.7%) when compared to non-certified offices. With administered costs rising at rates in excess of inflation, these costs can have a significant impact on performance over the lifecycle of a property. As a result, the green-certified office sample had a 50bp lower discount rate when compared to the

non-certified sample, implying that its future cashflows were deemed lower risk.

Green certified offices better across all measures

The MSCI South Africa Green Annual Property Index demonstrates the link between green-certified buildings and investment performance but also of its lower vacancy rate, lower operating cost, higher net operating income and lower discount rate in an extremely tough office market following the COVID-19 pandemic. The research clearly indicates that green certified buildings continue to outperform non-certified buildings. Not just because the perceived risk in the income stream is lower but is also underpinned by better property fundamentals – vacancies are lower and margins are higher. Certification therefore provides a proven tool for asset managers to leverage off giving investors an enhanced return.

The MSCI SA Green Annual Property Index is based on the market performance of Green Star certified buildings vs AAA grade non-green certified buildings in South Africa with the aim of understanding the comparative value of green building certification.

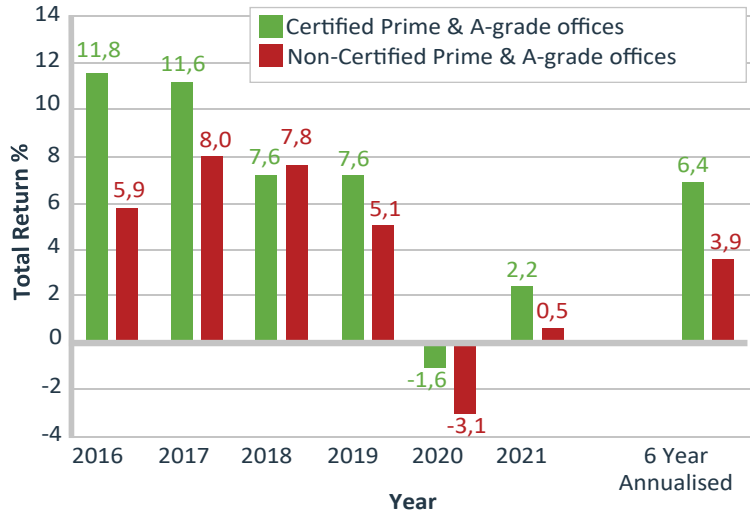
The MSCI index based on the financial performance of a building together with the GBCSA/ASAQS/UP data based on the green cost premium on the initial capital cost of a building, produces a convincing business case in support of Green Star certified buildings.

	Certified	Non-certified
Total Return (%)	2.2	0.5
Vacancy Rate (%)	15.6	16.3
Net Operating Income per square meter	144	111
Capital Value per square meter	20,998	16,226
Total Operating Cost % of Gross Income	35.6	39.8
Water Usage (m² per annum)	0.5	0.7
Electricity Usage (kWh per annum)	138	156

FINDING 1

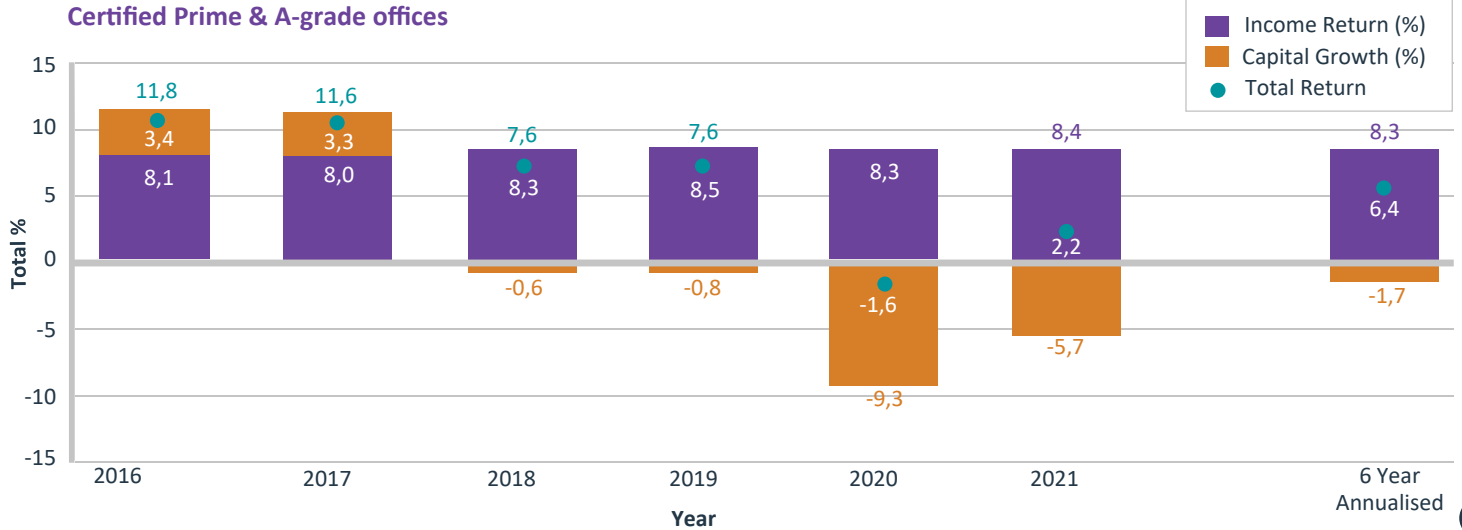
GREEN STAR CERTIFIED OFFICES OFFER HIGHER TOTAL RETURN OVER THE IMMEDIATE PAST AND OVER THE PAST 6 YEARS

* The components of Total Return are calculated separately using chain lined time weighted rates of return. Multi period capital growth and income return do not always add up perfectly when determining Total Return, due to the cross product that occurs when the Capital and Income Returns are combined within compounded Total Returns. Therefore, in this particular instance when adding up the Capital and Income Return components they do not exactly equal the Total Return.



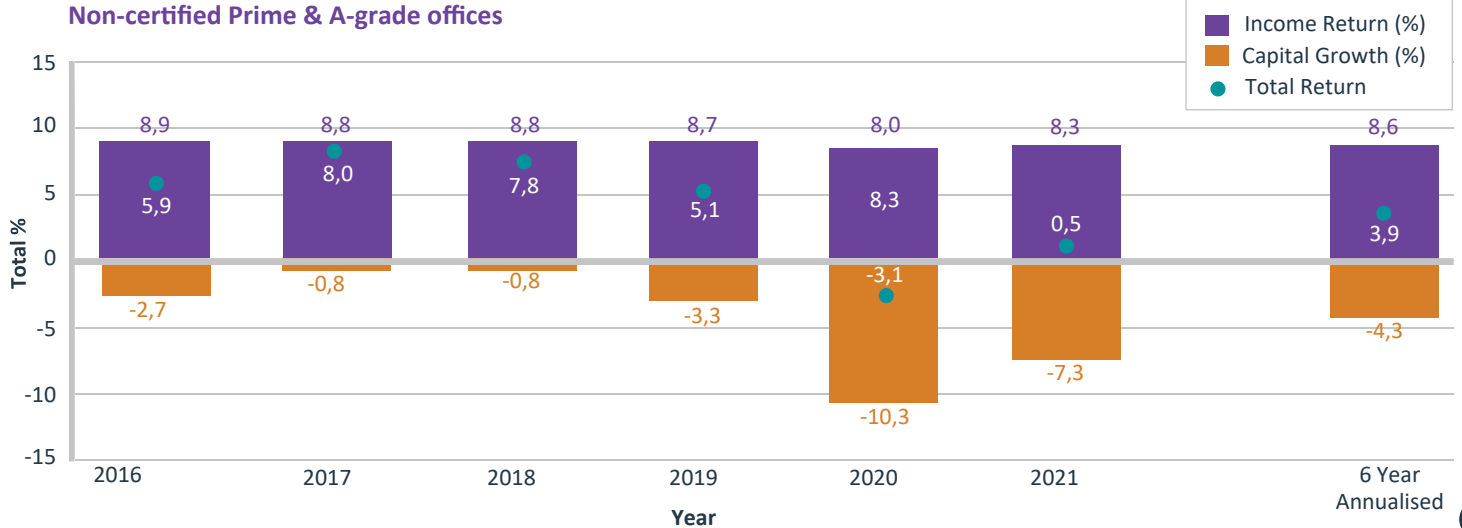
FINDING 2

GREEN STAR CERTIFIED OFFICES OFFER HIGHER TOTAL RETURN OVER THE IMMEDIATE PAST AND OVER THE PAST 6 YEARS



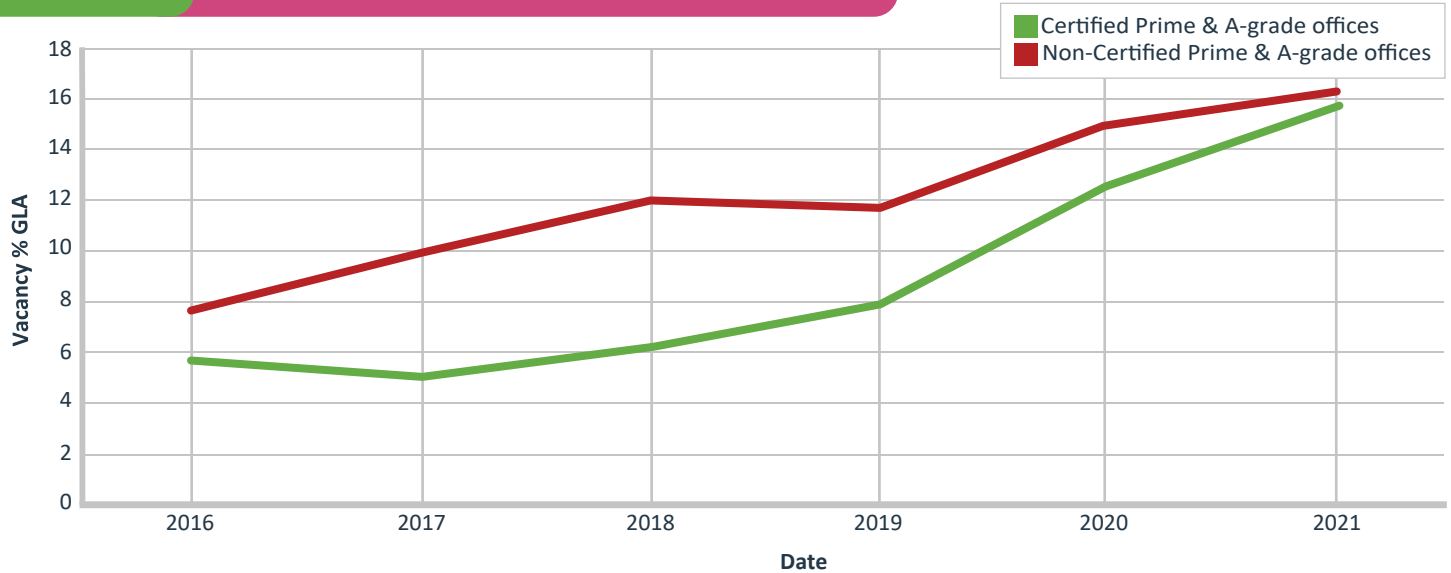
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GREEN STAR CERTIFIED OFFICES OFFER HIGHER TOTAL RETURN OVER THE IMMEDIATE PAST AND OVER THE PAST 6 YEARS



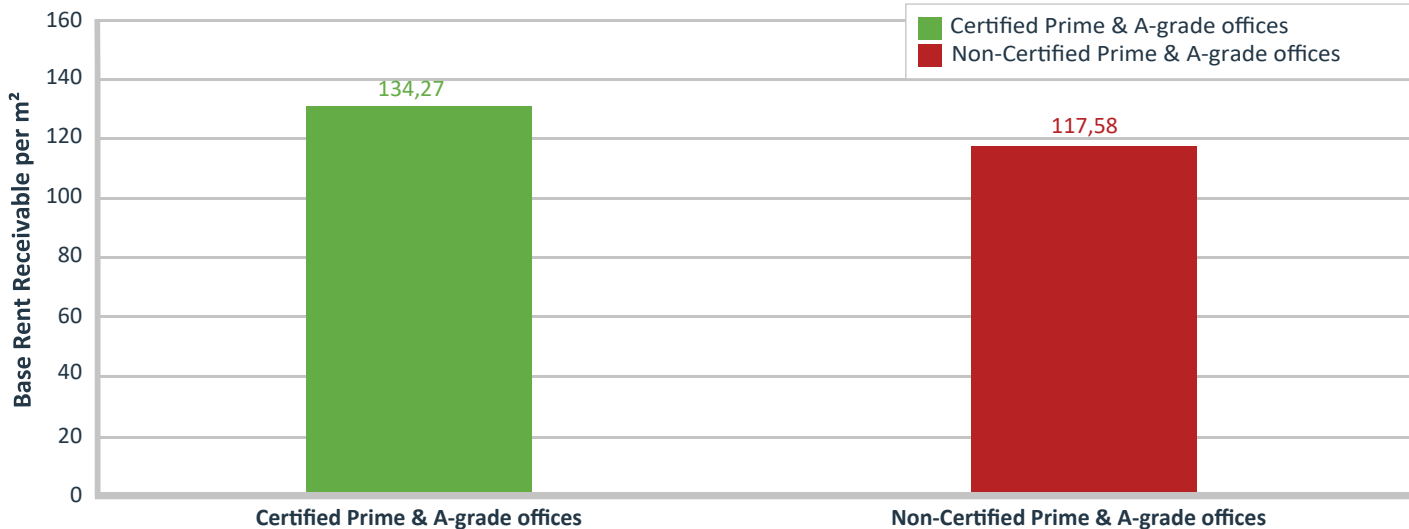
FINDING 3

GREEN STAR CERTIFIED OFFICES HAVE LOWER VACANCIES



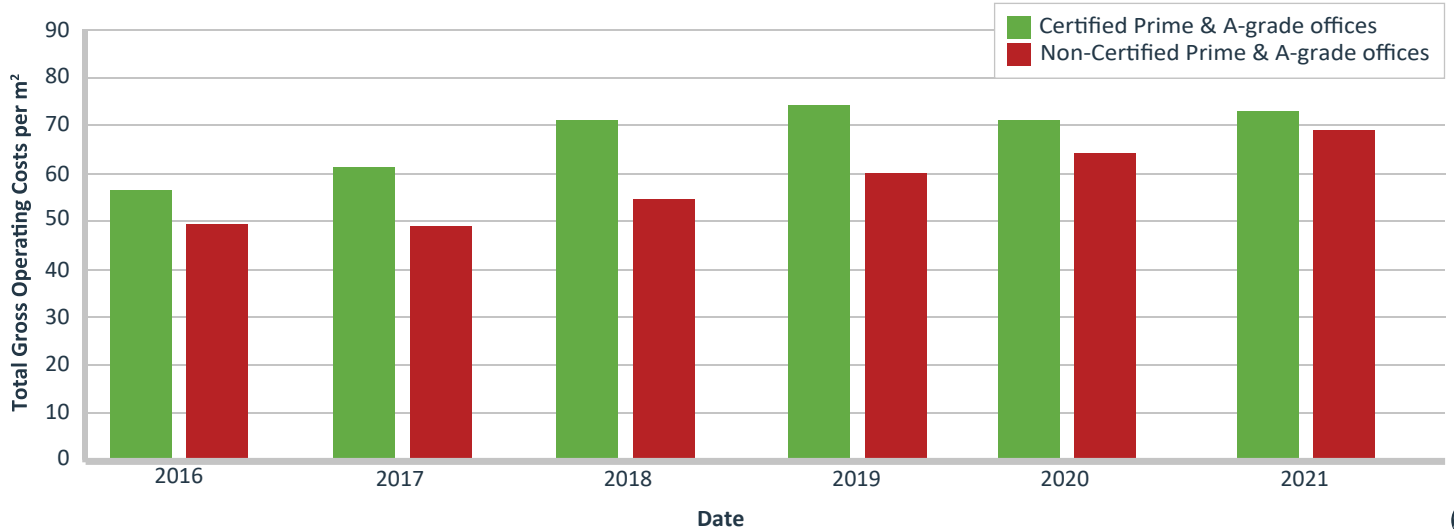
FINDING 4

GREEN STAR CERTIFIED OFFICES OFFER A SLOWER DECLINE IN BASE RENTAL GROWTH AND OFFER BETTER BASE RENTALS



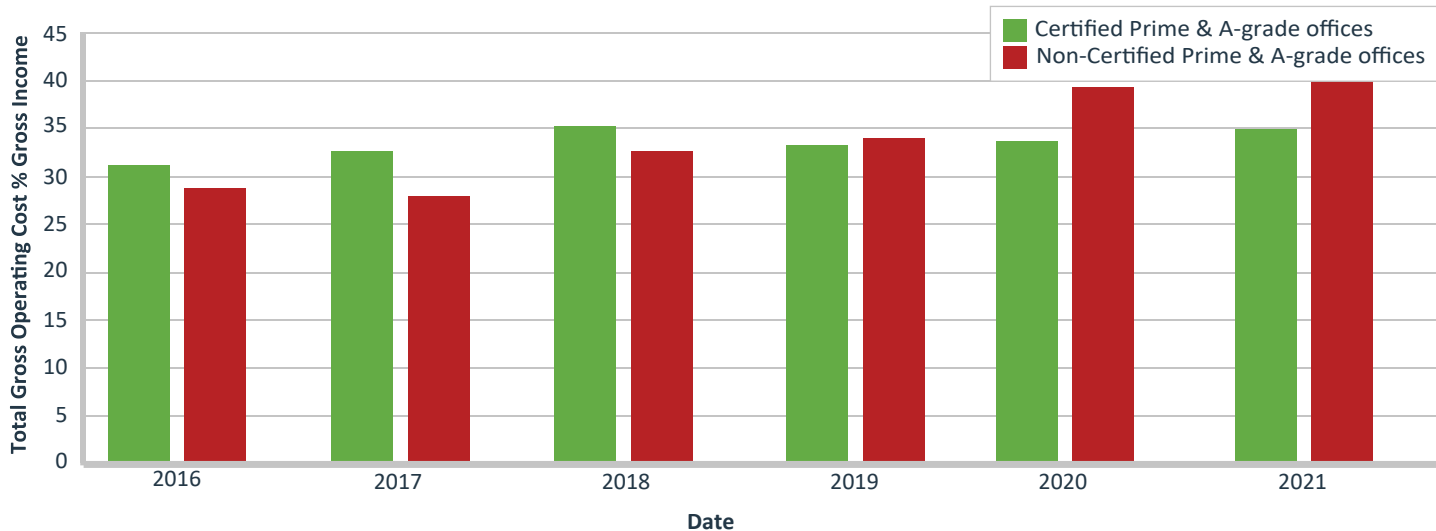
FINDING 5

GREEN STAR CERTIFIED OFFICES HAVE LESS TOTAL GROSS OPERATING COSTS AND OFFER BETTER MARGINS ON OPERATIONS



FINDING 5

GREEN STAR CERTIFIED OFFICES HAVE LESS TOTAL GROSS OPERATING COSTS AND OFFER BETTER MARGINS ON OPERATIONS



CONCLUSION

Certified Green Star prime and A-grade offices produced a total return of 2,2% in 2021 vs 0,5% for non-green certified prime and A-grade offices. Additionally, certified buildings outperformed non-certified buildings by 19,1% over the 6 year period (2016-2021).

Certified green buildings achieved a 29% higher capital value per square meter supported by 30% higher net operating income per square meter when compared to non-certified buildings.

Green rated offices reported a 11,6% less electricity usage per occupied square meter and 20,7% less water use per occupied square meter.

Green Star certified capital growth is driven by superior valuation metrics and property fundamentals:

- Lower discount rate
- Lower capitalization rate
- Higher net income per m²
- Higher net income growth
- Lower vacancy rate

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2022 EDITION



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