

# GREEN BUILDING IN SOUTH AFRICA

## GUIDE TO COSTS & TRENDS



2019 EDITION



The Association of  
South African  
Quantity Surveyors



Faculty of Engineering,  
Built Environment and  
Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en  
Inligtingsteunologie / Lefapha la Boets'enero,  
Tikoloko ya Kago le Theknolotzi ya Tshedi-moso

# HISTORY



- GBCSA established in 2007
  - 400 green buildings certified, 10,000 professionals trained by GBCSA
  - Before 2016 no credible construction cost data on Green Star SA certified buildings
  - Perception existed of significant Green cost premium
- GBCSA/ASAQS/UP published ***“Green Building in South Africa – Guide to Cost and Trends”*** in 2016
  - Provided cost data in an unbiased, consistent, credible and easily understood manner

# SCOPE OF WORK



## The study included:

- All South African office buildings
  - Certified by GBCSA by end of December 2014 (1st study)
  - Certified by GBCSA by end of December 2018 (2nd study)
  - With a 4, 5 or 6 Star Green Star SA certification
- With either “Design” and “As Built” rating
  - Using the Green Star SA Office v1 rating tool
  - 1st Study - a sample of 54 buildings owned by 34 companies
  - 2nd Study - a sample of 92 buildings owned by 52 companies

# STUDY FOCUS



The study focused on two aspects of green building cost:

## **THE GREEN DESIGN PENETRATION –**

The extent to which Office v1 tool introduced green design to the elements of the building, as % of total building cost

## **THE GREEN COST PREMIUM –**

The additional cost of a green building over the cost of conventional construction, as % of total building cost

# STUDY ANALYSIS



The study based the analyses of green building cost on:

- **Certification level**
  - **Location**
  - **Size - Construction area**
  - **Base building cost**
  - **Vertical façade ratio**
- **Certification date**
  - **Tenant Mix**
  - **Certification rating**
  - **Rating Tool categories**

# SAMPLE PROFILE



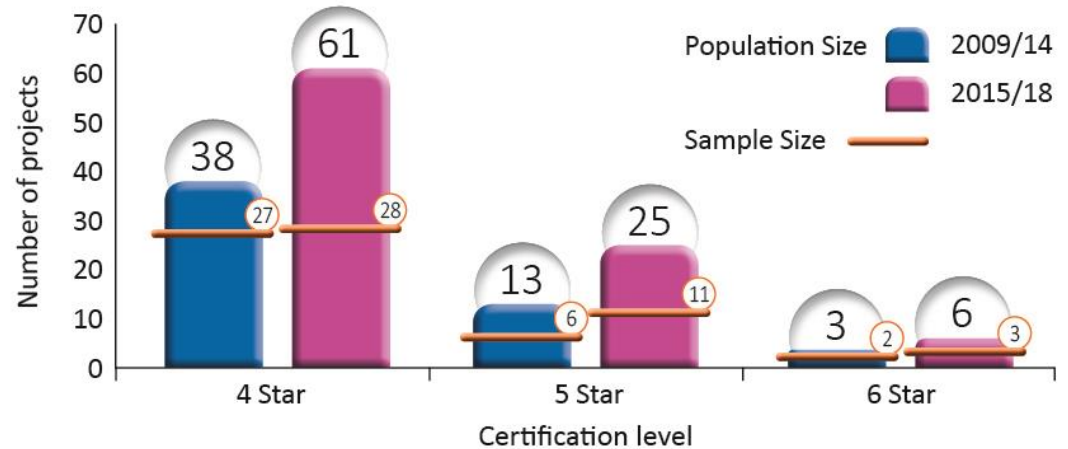
## Sample – 146 projects

4 Star – 99 (67,8 %)

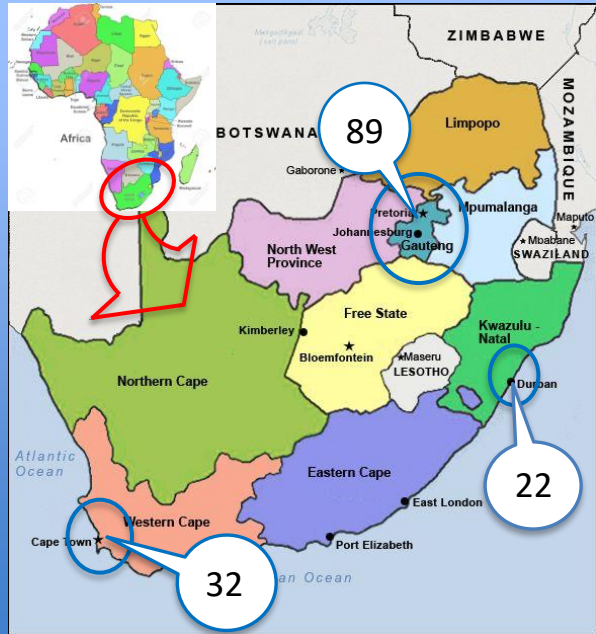
5 Star – 38 (26,0 %)

6 Star – 9 (6,2 %)

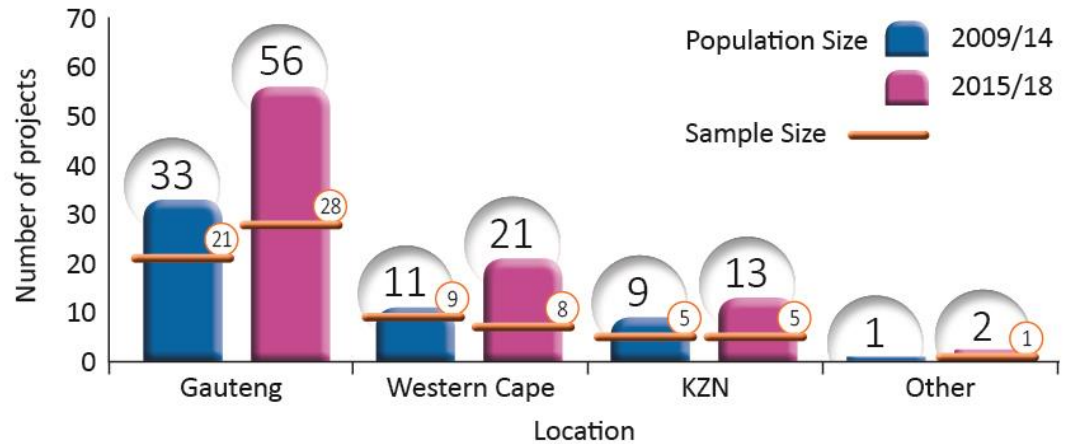
FIGURE 1 GBCSA CERTIFIED OFFICE PROJECTS 2009 - 2018



# SAMPLE PROFILE continued



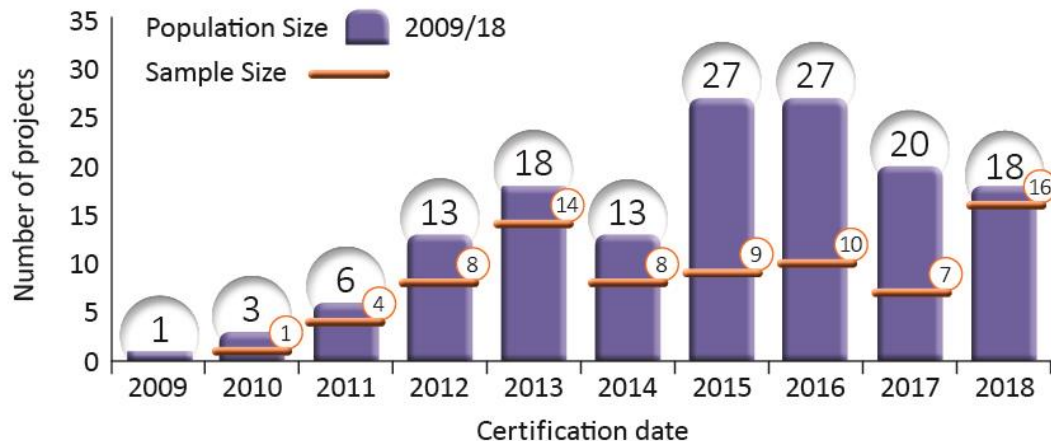
**FIGURE 2** PROJECT LOCATION FOR OFFICE PROJECTS CERTIFIED



# SAMPLE PROFILE continued

- Substantial growth of Green Star SA certified office buildings since 2009
- Slow down of 2017/18 probably due to challenging times experienced by the property industry

FIGURE 3 OFFICE PROJECTS CERTIFIED PER YEAR\*



# STUDY RESULTS

# GREEN DESIGN PENETRATION



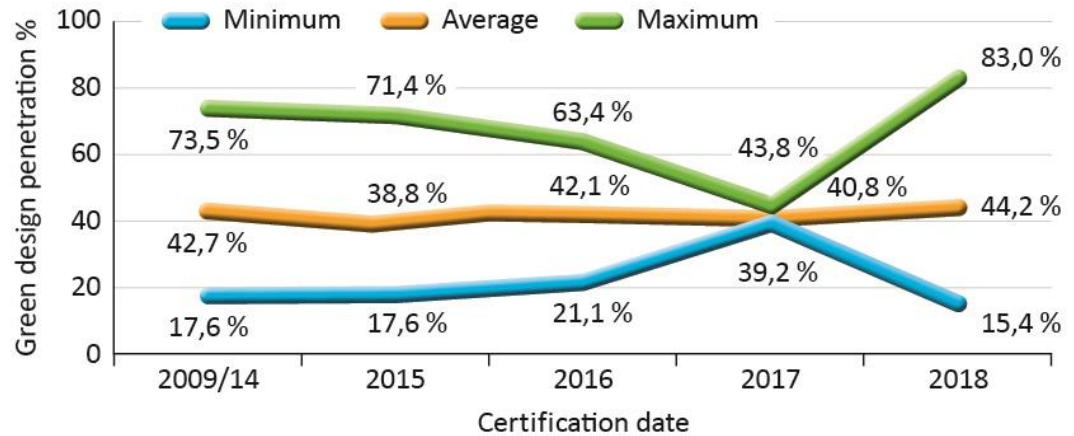
# STUDY RESULTS

## GREEN DESIGN PENETRATION

### DATE OF CERTIFICATION

Average penetration seems to stabilize at 40 – 45 % of total budget

FIGURE 4 GREEN DESIGN PENETRATION – CERTIFICATION DATE



# STUDY RESULTS

## GREEN COST PREMIUM



# STUDY RESULTS

## GREEN COST PREMIUM

### CERTIFICATION LEVEL

- Average green building cost premium reduced to 3,9 %
- The projects certified since Jan 2015 had an average green cost premium of 3,5 %

TABLE 1 GREEN COST PREMIUM – CERTIFICATION LEVEL

Certification level – Green cost premium (%)	MIN	AVERAGE	MAX
<b>TOTAL</b>	<b>1,1 %</b>	<b>3,9 %</b>	<b>14,2 %</b>
2009/14	1,1 %	5,2 %	14,2 %
2015/18	1,1 %	3,5 %	12,0 %

# STUDY RESULTS

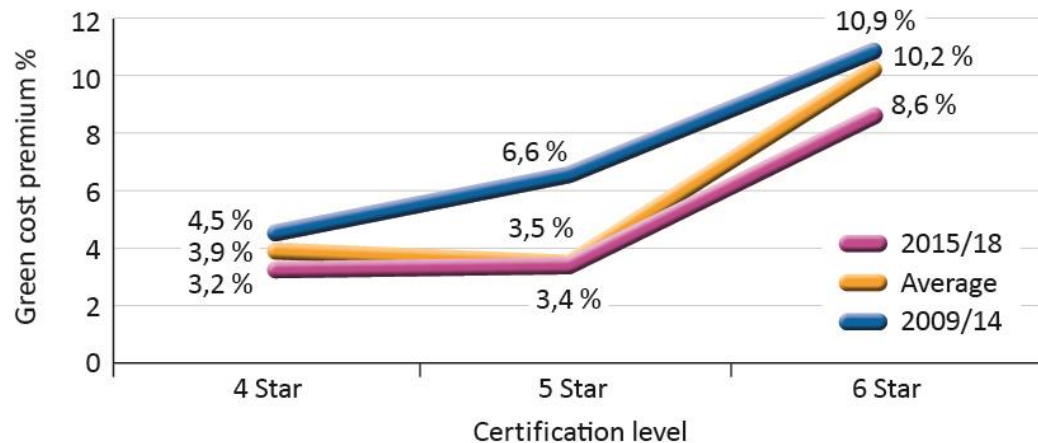
## GREEN COST PREMIUM continued

### CERTIFICATION LEVEL continued

**NOTE:** The average green building cost premium is indicated by the median – the numerical centre of the data set

The data sample was right skewed, the median was chosen as the preferred indicator over the arithmetic mean as it is less sensitive to skewed data

FIGURE 5 GREEN COST PREMIUM – CERTIFICATION LEVEL



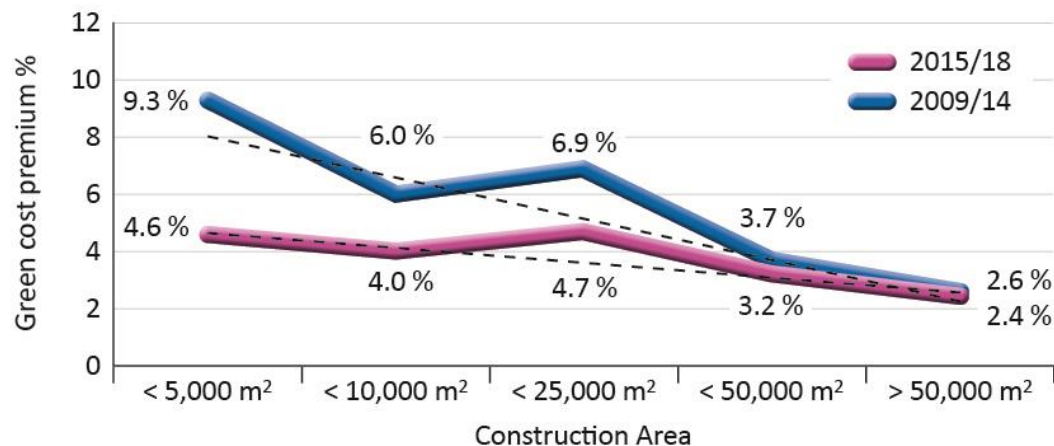
# STUDY RESULTS

## GREEN COST PREMIUM continued

### CONSTRUCTION AREA

The previous strong negative correlation between green cost premium and construction size was confirmed by 2015/18 data

FIGURE 9 GREEN COST PREMIUM – CONSTRUCTION AREA



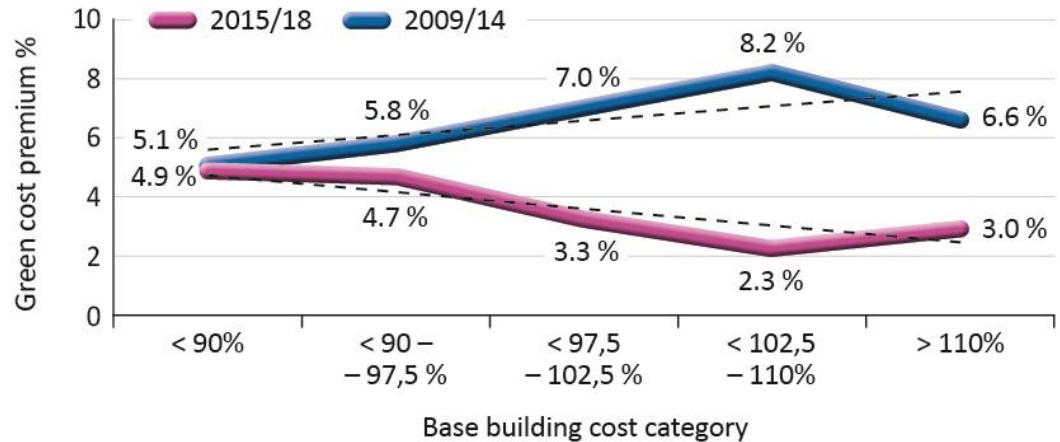
# STUDY RESULTS

## GREEN COST PREMIUM continued

### BASE BUILDING COST

- The 1st study found a marginally positive relationship between base building cost and green cost premium
- The 2015/18 data indicate a negative correlation between base building cost and green cost premium
- This was more in line with the original hypotheses

FIGURE 10 GREEN COST PREMIUM – BASE BUILDING COST



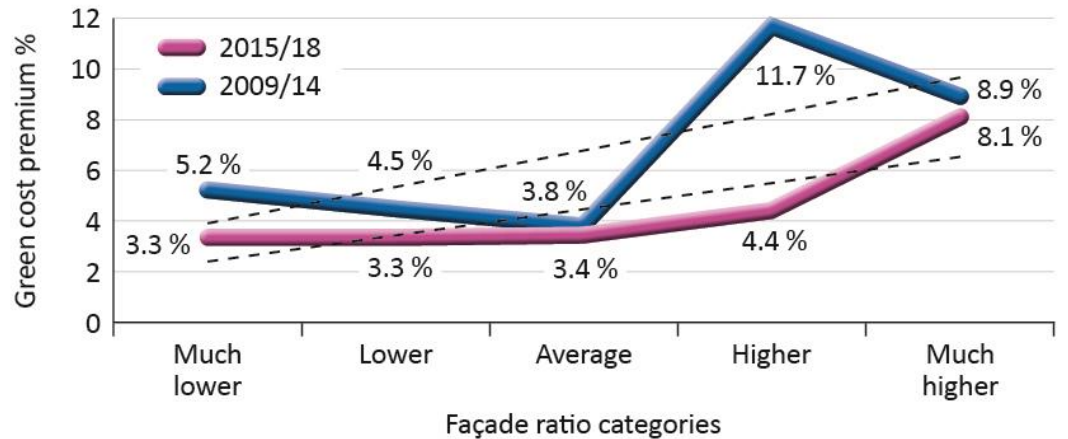
# STUDY RESULTS

## GREEN COST PREMIUM continued

### VERTICAL FAÇADE RATIO

The 2nd study confirmed that buildings with an above average vertical façade: construction area ratio also tend to have a much higher green cost premium

FIGURE 11 GREEN COST PREMIUM – VERTICAL FAÇADE RATIO



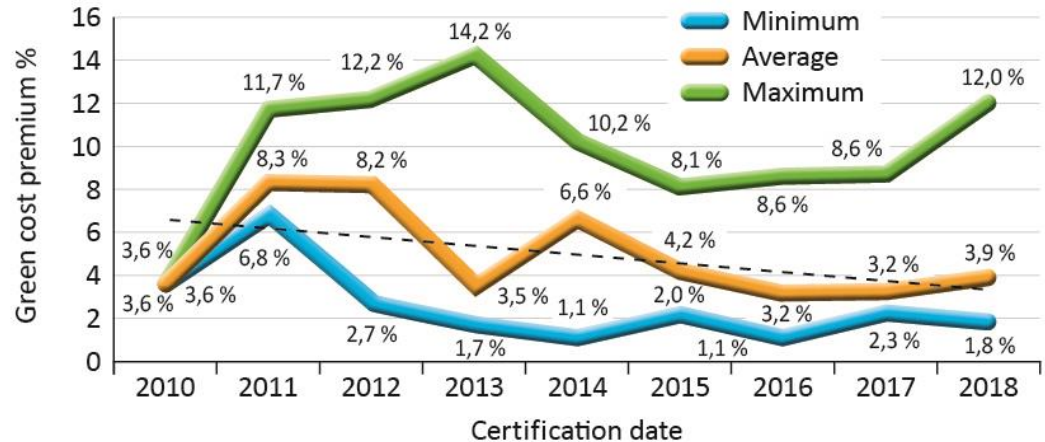
# STUDY RESULTS

## GREEN COST PREMIUM continued

### CERTIFICATION DATE

- The declining green cost premiums identified from 2011 – 2014 has continued and strengthened from 2015 – 2018
- Confirms a maturing of the South African green industry over time

FIGURE 12 GREEN COST PREMIUM – CERTIFICATION DATE



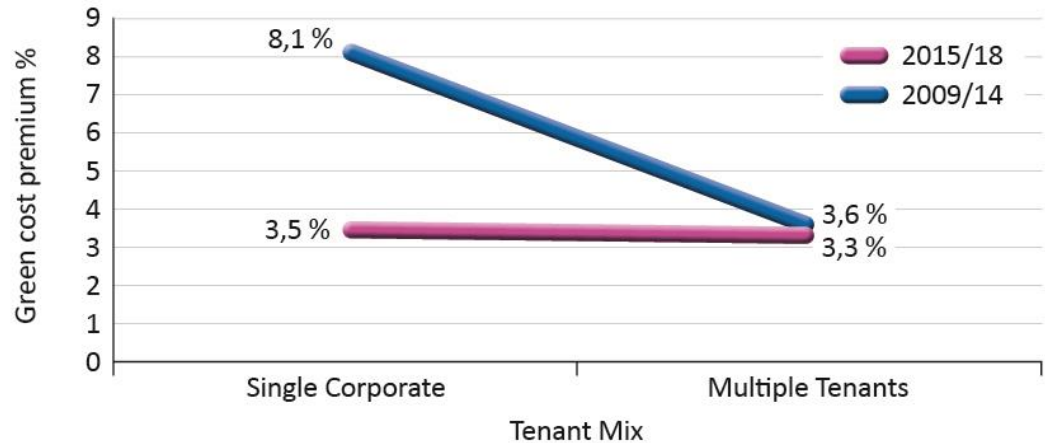
# STUDY RESULTS

## GREEN COST PREMIUM continued

### TENANT MIX

Projects for single, corporate tenants still carried a higher green cost premium, but was much closer to the premium for buildings developed for multiple tenants

FIGURE 13 GREEN COST PREMIUM – TENANT MIX

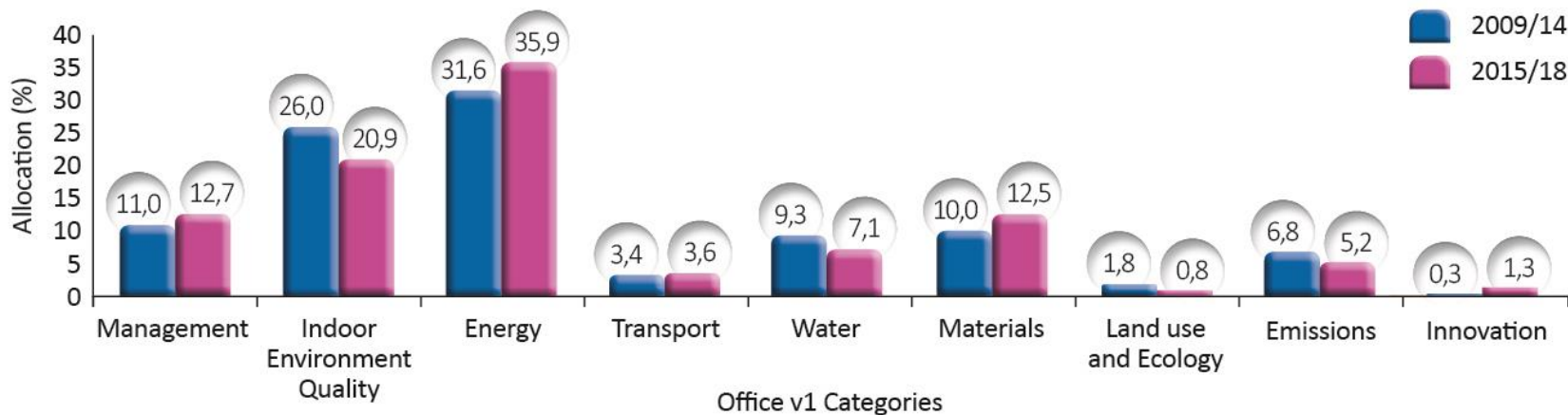


# STUDY RESULTS

## GREEN COST PREMIUM continued

### RATING TOOL CATEGORIES

FIGURE 15 GREEN COST PREMIUM – RATING TOOL CATEGORIES



# ACKNOWLEDGEMENTS



**All Participating Projects**

**Green Building Council South Africa**

**University of Pretoria, Department of Construction Economics**

**The Association of South African Quantity Surveyors**

# QUESTIONS?



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