# Green building costs in South Africa

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**A joint study on the cost of green building in South Africa has been conducted by the Green Building Council of South Africa (GBCSA), the Association of South African Quantity Surveyors (ASAQS) and the University of Pretoria. The purpose of the study was to provide certainty on the actual cost of South African green building and to specifically calculate the cost premium paid to achieve a Green Star South Africa (Green Star SA) certification rating from the GBCSA.**

The study also addressed a long-standing perception in the building industry that green building costs significantly more than conventional construction. Knowledge and awareness of global warming, and the need for a sustainable building industry in South Africa have been increasing steadily since the turn of the 21st century. The establishment of the GBCSA in 2007 significantly increased this awareness in the South African built environment.

To date, more than 180 buildings have been awarded a Green Star SA certification, and more than 7 000 professionals have enrolled for GBCSA training courses. However, the growing green building industry is also experiencing challenges. Locally and internationally, research has indicated that there is a widespread perception that green building attracts a cost premium as high as 15 to 25% compared to conventional construction. These perceptions hamper the progress of green building.

The vast majority of GBCSA certifications issued between 2009 (when the first certification was done) and 2014 (when this study was launched) were issued to new office buildings. To ensure the consistency and relevance of the findings, the study only focused on office buildings.

The research report included all of the 54 South African office buildings that had been certified by the GBCSA between 2009 and 2014. These buildings were awarded with 4-Star, 5-Star and 6-Star ratings by the GMCSA. All 34 companies that own these buildings agreed to participate in the study. The cost data was obtained from the professional consultants involved in the various construction projects that were included in the study sample.

The primary focus of the study was to describe the green cost premium or the additional cost of green building over and above the cost of conventional construction, expressed as a percentage of the project's total cost. The green design penetration was also evaluated. This expressed the extent to which green design aspects were introduced into the different elements of a project, and was expressed as a percentage of the total project cost.

The study used various generic building cost-related aspects to analyse and describe the findings in more detail. These aspects include the Green Star SA certification level awarded, the location, the relative size, the base building cost (R/m$^2$) or specification level, the vertical façade ratio, the certification date and the tenant mix. The study also evaluated the percentage of the green cost premium spent on each of the nine different categories of the Office v1 rating tool to describe the typical design strategies followed for the certified buildings.

All but one of the 54 sample projects are located in Gauteng (61%), the Western Cape (20%) and the Durban/Umhlanga area of KwaZulu-Natal (17%). Of these projects, 70% received a 4-Star rating, with 24% and 6% receiving 5-Star and 6-Star ratings respectively. The construction area of the sample projects varied from 858 to 74 244 m$^2$.

The certification date of the projects confirmed the exponential growth of the green industry in South Africa, as 81% of the projects had received certification in the last three years covered by the study compared to only 19% during the first three years. During the first three years covered by the study, almost 80% of the certified projects were designed for a single, corporate tenant, while

only 59% of the projects completed in the last three years had a single corporate tenant.

## Results

The data sample of the green cost premium was slightly right skewed (0,389). The median was therefore chosen as an indicator for the central tendency of the data, as it is less sensitive to skewed data than the arithmetic mean.

The major finding of the study was that the average green building cost premium achieved by the projects was 5% of the total project cost (see Table 1).

The study has therefore clearly indicated that the green building cost premium of 5% is relatively small, and much lower than the perceived cost premium of 15% and more. This study has also provided the South African property industry with the first set of cost parameters of good practice in green building, based on the achievements of actual projects.

Several other significant correlations were found between the green cost premium and aspects such as the construction size of green buildings, the vertical façade ratio, the certification date (maturity level) and the building's tenant mix. The study found that, on average, 42.7% of the project budgets of certified green office buildings now contained green design elements to adhere to the requirements set by the GBCSA (see Table 2). This confirmed that the GBCSA's certification process had resulted in a widespread effect on the design and construction of buildings certified by Green Star SA ratings.

The study revealed that almost 58% of the total green cost premium was allocated to only two of the nine categories of the Office v1 tool, namely Energy and Indoor Environment Quality (IEQ). Even though the two categories carry a combined weighting of 40% in the Office v1 tool, the study has revealed that design teams emphasise Energy and IEQ in their green design strategies.

## Future research

Further work to extend the study's findings through the inclusion of the cost data of the Green Star SA office projects certified in 2015 and 2016 is about to start. The local green industry is maturing and the patterns and trends identified will still evolve over time. It will be important to describe the development of South African green building cost trends as the industry further expands and matures. The trends identified in this study will therefore have to be continuously observed and documented.

Green building is also taking place in other major sectors of the real estate industry, such as the retail, industrial, residential and educational sectors. As cost trends of these sectors will not necessarily duplicate or follow the cost trends presented by the office sector, different cost parameters for each real estate sector will have to be established, which offers various opportunities for future research studies.

### Table 1: Green cost premium

| Certification level – green cost premium | Minimum | Average | Maximum |
|---|---|---|---|
| **Total** | 1.1% | 5.0% | 14.2% |

### Table 2: Green design penetration

| Location – green design penetration | Minimum | Average | Maximum |
|---|---|---|---|
| **Total** | 17.6% | 42.7% | 73.5% |


→ *The findings of the study were officially launched to the public at Gallagher Estate, Midrand, on 15 July 2016.*


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