Motivation for Green Buildings

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Introduction

It is interesting to note that Greenpeace activists and vegans who previously lived in small communities on the fringe of conventional society are now joined by hybrid driving film stars who actively practice and support the green movement. Similarly, the perception that green buildings require walls of earth construction has been replaced by the realisation that corporate headquarters can achieve green building status, while simultaneously projecting an image of sophistication.

A measure of the trend towards the design and construction of green buildings in South Africa is the number of certified green buildings which have been built following the introduction of South Africa’s green building certification system.

The Green Building Council of South Africa (GBCSA) uses the Green Star system (an adaptation of the Australian green building certification system of the same name) to evaluate and rate the green credentials of buildings. Buildings are rated on a scale from 4 to 6 with buildings scoring below 4 stars not considered eligible.

The Green Star rating system was introduced by the GBCSA in 2008. The increase in the number of certified green buildings in SA over the last 3 years is illustrated in the table below:

<table>
<thead>
<tr>
<th>Year</th>
<th>Design Rating</th>
<th>As Built Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2011</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>2012</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: ‘design’ ratings are awarded to incomplete projects, once completed projects can then target ‘as built’ ratings.
Why build green?

Green buildings form an important part of the generation of sustainable built environments which includes the infrastructure, services, buildings and networks which make up our cities and towns. These are the spaces in which an increasing majority of the world’s population lives, works and recreates. The notion of sustainable built environments is a broad one and does not address specific motivations for the construction of green buildings.
Motivation for Green Buildings

The carrot and the stick

Motivations for building green are many and diverse but can be divided into ‘stick’ and ‘carrot’ categories.

Stick elements require compliance by the building owners through provincial or local legislation such as building codes, governance requirements or financial penalties in the form of higher utility bills and emissions off-sets. The South African National Building Regulations were revised in 2011 to include a section which addresses energy efficiency through restrictions and guidance on the design of building envelopes, water heating and natural / artificial lighting.

Carrot elements are less easily defined but typically take the form of improved property values and improved interior environments which lead to longer tenant occupancies and green branding opportunities. One of the most interesting benefits of green office buildings is the reductions which can be achieved in absenteeism through providing a healthier working environment.

The relationship between green buildings and user wellbeing is difficult to pin down. Prof. Andrew Thatcher of the University of Witwatersrand provides the following indicators:

- Productivity (absenteeism, employee retention)
- Human resource development (physical health, psychological wellbeing)
- Stakeholder relations (improved public image).

Vivian Loftness of the Carnegie Mellon University Centre for Building Performance & Diagnostics uses a number of case studies to illustrate the effect of indoor environments on their occupants such as the following:

- In a 2004 multiple building study of professional middle-aged women in France, Preziosi et al identified a 57.1% reduction in sickness absence, a 16.7% reduction in medical services (doctor visits), and a 34.8% reduction in hospital stays among subjects with natural ventilation in their workplace, as compared to those with air conditioning.

- In a 1996 multiple building study of 80 homes in Victoria, Australia, Garrett et al identified a 60% reduction in the prevalence of asthma and a 63% reduction in the prevalence of allergies among children whose homes contain formaldehyde-free composite wood products, as compared to those exposed to formaldehyde from furnishings and products in their home.

While some organisations are forced to implement sustainable initiatives within their organisations through local or international compliance requirements, others choose to do so in order to achieve a better green profile or because such practices are deeply entrenched in their decision making processes. In many cases the buildings occupied by companies, institutions, civil services and individual entities act as a physical manifestation of their values and ethos. Aurecon a global engineering, management and specialist technical services company, which provides services to public and private sector clients, took occupation of their new 5 Star rated Green Star SA office building in Century City, Cape Town in August 2011.

Hannes Kritzinger, Aurecon’s office manager notes: ‘By using [our expertise in engineering and sustainable buildings] we put our money where our mouth is. We not only offer these services to our clients but do it for ourselves too.’ Albert Geldenhuys, Aurecon’s general manager for South Africa comments that, they ‘looked at it not only from a tenant point of view, but also as investors. A sustainable building will hold it’s value longer. Sustainability is not only about water and energy, but about a building that makes sense in the longer term.’

Since the emergence of a green building on the South African building scene, there have been many misconceptions about the costs associated with this type of building when compared with conventional construction costs. It is noteworthy that until the start of this century South Africa enjoyed some of the lowest energy, water and construction costs in the world.

Although this supported positive growth in the building industry it also supported inefficient construction methods and excessive resource consumption by the built environment. Nicola Milne, founding CEO of the GBCSA and author of ‘The Rands and Sense of Green Building’ reveals that the South African property industry can expect cost premiums of a new commercial green building to be between 3% - 10%.

The developers of the 40 on Oak development (a 4 Star rated Green Star SA residential development in the Melrose Arch precinct in Johannesburg) said that the construction value was affected by less than 1% to achieve Green Star certification.

The capital cost premium to green the Absa Towers West office building (5 Star rated Green Star SA office building) in central Johannesburg is reported to be less than 2%, including the costs related to the Green Star SA certification.
More work is required in researching the costs and benefits of green building in South Africa – especially in terms of productivity benefits associated with the improved indoor environment quality. But even at this early stage, the business case for green building is very strong. This is particularly relevant when one considers the realignment of South Africa’s utility costs with worldwide trends. The era of cheap and abundant resources has come to an abrupt end.

Construction of Ernst & Young’s new Johannesburg office, a stone’s throw away from the Sandton Gautrain station is currently underway. As part of the firm’s intention to integrate technical and physical work environments which support the way its people work, the new building has been registered for Green Star certification. The final outcomes of the project will only become clear on completion of the project but Ernst & Young staff and clients await the completion of the project with great anticipation.

How to build green?

When making the decision about what type of building investment to make clients would do well to consider the difference between a full blown, certified green building and a resource efficient building. A Green Star rated building is required to comply with multiple credits within 9 different categories which include energy, water, emissions, land use and ecology, amongst others. Closely managed design and construction processes are required to achieve these targets. A clear vision of the project outcomes is required from the start.

A resource efficient building, on the other hand, is designed and built to conserve energy, water and waste with the primary benefits being cost savings and a reduction in direct environmental impact*.

The South African property industry has struggled to legitimise any form of green building which has not been certified by the GBCSA. This has occurred largely as a result of poor quality products and incorrect installations by unscrupulous contractors who have capitalised on the rapid increase in electricity tariffs.

Recent economic crises have helped to weed out the weaker service providers but many property owners and developers remain uncertain of the returns on capital investment and the best solutions for resource security.

The first item for consideration when building green is your organisations or (in the case of developers) projects goals. The question: which combination of cost reduction, reduced negative environmental impact, green credentials, carbon strategy and compliance serves your organisation best? Once this has been established the most appropriate building type can be identified. Engaging the right team is the final step in preparing for the implementation of your green building project. Case studies have repeatedly shown that an integrated approach towards the design and construction of buildings (and this is especially true of green buildings where decisions have knock-on consequences) produces the best results.

*Close proximity to public transport (a Green Star SA credit) would be an indirect environmental impact of a green building