

Business Sense for Green Buildings

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Abstract—It is predicted that the population of our global cities is projected to double by 2050. This presents a great challenge before the property industry. The property industry has a key role to play in creating more sustainable places in which future generations will want to live, work and play. The property industry has to be brave and innovative to create and manage buildings, communities and cities which are not only efficient in environmental terms, but also promote a high quality of life for all who pass through them. Green building is now a global movement and sustainability delivers benefits that are well beyond environment. This paper discusses benefits of Green buildings and presents that green buildings are necessary not only to safeguard environment but they also present business sense.

Keywords: sustainable development, productivity, occupancy, risk mitigation,

1. INTRODUCTION

Climate change and the need to reduce GHG emissions, in particular CO₂, is probably the most important and urgent issue facing mankind. Because buildings contribute about 23% of total emissions they should be at the frontline of the fight against global warming [1]. The strain on our environment has become more evident as buildings and cities continue to grow in parallel with global populations. It is imperative that each country should have their own agenda on sustainable development. On a global scale, everyone needs to be involved and consciously contributing to the cause. Today 'Green' is no longer considered marginal or niche, in fact nongreen buildings now occupy this space. The industry has come to understand the reality of climate change and the need and urgency to create a sustainable future by adopting 'green' principles in all stages of the building life cycle [2].

In recent years, a wide range of studies and reports points to an increasingly compelling 'business case' for green buildings which is much more than just about saving the planet [1]. There is a strong evidence that going green is good business – sometimes even for unexpected reasons. Perhaps the best indicator of the rapidly changing level of acceptance and adoption of green building practices is the increase in the numbers of buildings registered with and certified by the organisations like Green Building Council of Australia under the Green Star environmental rating system for buildings and by Griha[2][3][4].

2. THEORETICAL BACKGROUND

The global trends are in favour of green buildings. The global green building market grew in 2013 to \$260 billion, including an estimated 20 percent of all new U.S. commercial real estate construction. This trend is expected to intensify in the coming years, both in the US and internationally [5]. A recently published global survey of construction firms found that 63% of construction firms had new green commercial projects planned between 2013 and 2015. 45% have plans for new green institutional projects, and 50% have plans for green renovation work [6]. The top two reasons for building green: client demand (35%) and market demand (33%)[7]

The report[1] investigates the business costs and benefits of green building in five vital categories: design and construction cost, asset value, operating cost, workplace productivity and health, risk mitigation. In his book, *The Green Building Revolution* Jerry Yudelson [3] has opined that business case for green buildings is a framework of benefits: economic (reduced operating costs, reduced maintenance cost, increased building value), productivity, risk management, health, public relations and marketing (stakeholder relation and occupants satisfaction, environmental stewardship, more competitive products in market place, recruitment and retention and funding.

A green building depletes the natural resources to a minimum during its construction and operation. The aim of a green building design is to minimize the demand on non-renewable resources, maximize the utilization efficiency of these resources when in use, and maximize the reuse, recycling, and utilization of renewable resources[4].

The McGraw Hill survey [7] found that the market advantages of green are: Market differentiation - over 50% Operating cost benefits - 58% Creation of innovative culture - 57% Bottom line improvement - over 33%. The Green Building Council of Australia defines a green building[2] as one that incorporates design, construction and operational practices that significantly reduce or eliminate the negative impact of development on the environment and occupants with strategies for addressing: 1. energy efficiency; 2. greenhouse gas emission abatement; 3. water conservation; 4. waste avoidance, reuse and recycling; 5. pollution prevention - noise,

water, air, soil and light; 6. enhanced biodiversity; 7. reduced natural resource consumption; 8. productive and healthier environments; and 9. flexible and adaptable spaces.

“Green building” is a term used to describe a building that is more energy and resource efficient, releases less pollution into the air, soil and water, and is healthier for occupants than standard buildings [8].

3. BUSINESS SENSE OF GREEN BUILDING

On the basis of literature review provided above following arguments are provided in support of Business case for Green Buildings:

3.1. Design and Construction Cost

Research shows that building green do not necessarily cost more. A study by Davis Langdon, published in 2007[9] finds that “...there is no significant difference in average cost for green buildings as compared to non-green buildings”. It is an achievable target [10], particularly when cost management, program management and environmental strategies are integrated right from the project planning phase [9]. Hiring experienced design and construction team [11] and using an Integrated Design Process (IDP) from pre-design phase to post occupancy plays an important role.

Higher upfront capital cost for green buildings are proportional to increased level of environmental certification. For projects aiming for zero carbon building increase in design and construction cost is 12.5% higher but for majority of certified buildings the cost range from 0% to 4% high. These upfront costs are often offset by a decrease in long-term life cycle costs. There is also increasing awareness, acceptance and education around green building certification and assessment tools. More and more professionals are becoming well-equipped to design and certify green buildings. Clients (i.e., investors, owners and developers) are increasingly aware of sustainability and energy issues and demand more expertise from the industry. This increase in skills, tools and supply chain maturity have meant that the costs associated with achieving certification have decreased and will continue to decrease as green building becomes more mainstream[12]

CASE STUDY 1

Owner and master developer, Inmobiliaria Almahue, decided to build the 16-story Costanera Lyon I office building in Santiago, Chile, in late 2008, during the time of global financial crisis. Despite the reluctance of many developers to launch projects in this time of limited cash flow and risk aversion, which was further complicated by a recent 8.8 magnitude earthquake in the region, the owner pursued LEED certification to showcase the benefits of sustainable building practices. As a result, Inmobiliaria Almahue not only managed to design and build a LEED Silver building at zero additional cost but also to sell all of its 54 office units before the building was completed. While most of the prospective

buyers were not initially aware of the LEED certification process, the expected benefits of having low operating costs and the low environmental impact of the project became the owner’s most important sales pitch. The building is a perfect example of integrated design process(IDP)

3.2. Asset Value

Green building asset value has different connotation with different people. Owners, developers, investors and tenants have their own definition of asset value. Fig. 1 below summarizes the determinants of value as they relate to the different stakeholders. Studies reveal that green buildings have higher asset value than their conventional counterpart. The difference in asset value is due to difference in sales price which is related to following benefits:

3.2.1.Higher rental and lease rates

Green buildings are more attractive in terms of superior indoor environment lower operating costs and enhanced marketability. In some markets where green buildings are more mainstream, a slightly different concept is emerging: where buildings that are not green result in lower rental and lease rates, or ‘brown discounts’.

3.2.2.Lower operating costs:

Green buildings need less energy and water and henceforth are cheaper to own and operate [13]

3.2.3.Higher Occupancy rates

They have better performance in local market as compared to their non certified counterparts providing more assurance to developers and owners regarding rate of return[14]

3.2.4. Lower yields

They lead to higher transaction price at the time of sale.[15] higher levels of certification are linked to both higher build costs and generally higher asset values. The premium in market price is much higher than the build costs and they are able to command higher sales price and rent. The results from the study indicated an increase in occupancy rate and average 3% increase in rent for each increase in certification level.

CASE STUDY 2

When real estate fund manager PRUPIM sought new tenants for empty space in Hollywood House, a multi occupied office building located in Woking just outside of London, securing a strong tenant was a challenge for a building that was inefficient in terms of energy use and had high operating costs compared with current market standards. Construction and project development company Skanska approached PRUPIM with the requirement for an energy efficient building that worked for its employees and met its green commitment. PRUPIM recognised an opportunity to protect the value of its asset by retaining a major tenant on an extended lease and attracting further new tenants to a significantly upgraded,

greener building. Extensive refurbishments with significant green interventions were implemented including: Connection to district heating and power; Energy efficient lighting; Improved ventilation and energy management systems etc. This resulted in using 56% less energy than before the refurbishment, and 55% less water than standard. The cost of the green interventions is expected to be recovered in 13 years through energy savings alone.

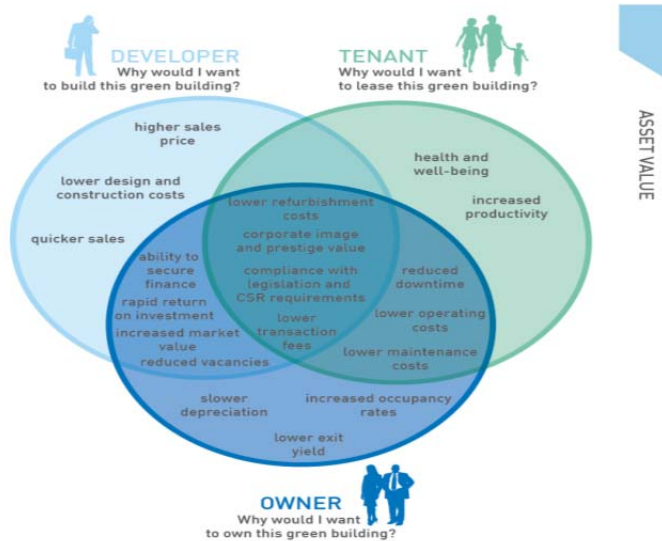


Fig. 1: The Business case of Green Buildings, A Review of cost and benefits for Developers, investors and occupants. , World Green Building Council

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3.3.7. Operating Costs

The true test of Green buildings lie in how well the designs operate once they are in occupancy phase. Occupancy related benefits can be realized in two areas: maintenance costs; and productivity and health benefits. Reduced energy consumption, and the consequent reduced energy costs, is one of the defining features of any green building. Energy efficiency also has a significant impact on the overall running costs of a property; as energy prices rise, operational energy efficiency will likely become one of the more important drivers for occupier demand. Energy efficiency retrofits such as thermal envelope improvements, heating and ventilation system upgrades, lighting upgrades, sub metering, improved controls, water saving fittings and fixtures, renewable energy installations are rapidly growing in importance. A study of buildings in Singapore reveals that the resulting energy savings of a sample of buildings is 17% post retrofit.

3.4. Workplace productivity and health

Research shows that green design attributes of green building and indoor environment improves workers productivity, occupant's health and well being and results in bottom line benefits for business. Investing in indoor environment can lead to better returns on company's greatest asset that is its employees. There are evidence that better indoor environment increases workers productivity by 18%, mental function and memory increases by 10-15%, students achieve 5-14% higher test scores, productivity increases 23% from better lightening, 11% from better ventilation, and 3% from individual temperature control. Heerwagen (1998) showed that workers exhibit reduced signs of stress, including reduced levels of frustration, increased patience and overall satisfaction, when they have views to nature through windows. So rather than thinking 'how much will green building cost my business' there should be a shift to 'how much will not investing in green building cost my business?'

3.5. Risk Mitigation

Sustainability risk has impact on rental income and future evaluation of the value of assets thus affecting return on investment. Today regulatory risk have become very important in most of the nations including mandatory disclosure, building codes and laws banning inefficient buildings. Apart from regulatory risk real estate investors should also evaluate how sustainability will have an impact

from marketing perspective- in terms of supply demand and associated factors.

There can be occupancy risk as more green buildings become available and occupiers become less willing to occupy non-green buildings, it will increase the speed of depreciation for non-green buildings at an exponential rather than linear rate. In order to help the investors to develop more environmentally efficient real estate portfolios a number of green property indices have been developed for example the FTSE Group in US and “Eco-Portfolio Analysis Service” (EcoPAS) in UK which seeks to enable investors to

understand potential environmental risks in their portfolios. All the other risks have been summarized in the risk radar in Fig. 2 below.

CASE STUDY 3

Historically Liverpool was an important shipping dock that faced slump in retail banking; unemployment increased leading to slow down in shipping industry. This was a sad state of affairs for previously magnificent city. However Liverpool City Council saw an opportunity in it .They converted 42 acres of inner city land that was heavily bomber during war and was derelict into The Liverpool ONE. It was an integrated effort of the developers who developed a ‘building in the city’ approach which converted the 26 buildings into certified BREEAM Good and Very Good category. Considering the sustainable travel holistically they created a new bus stand, new cycle and walking routes which resulted in 30% people using car which before was 100%.They developed innovative biodiesel plant that produces enough fuel to power all onsite vehicles from used cooking oil of nearby restaurants. The most exciting legacy of Liverpool ONE is the work being undertaken with local schools, colleges and universities. The project offers various employment opportunities to people in local communities.

4. MOVING FROM GREEN BUILDINGS TO GREEN CITIES

A city in its simplest form is a collection of buildings. Green buildings will unlock the potential of our built environment to deliver on macro social and economic priorities such as climate change mitigation, energy security, resource conservation and job creation, long-term resilience and quality of life. Addressing climate change can make our cities better, more liveable places. Henceforth the priority issue for the government around the world is ‘big picture’ benefits. The critical point is that green buildings are the future – the new generation.

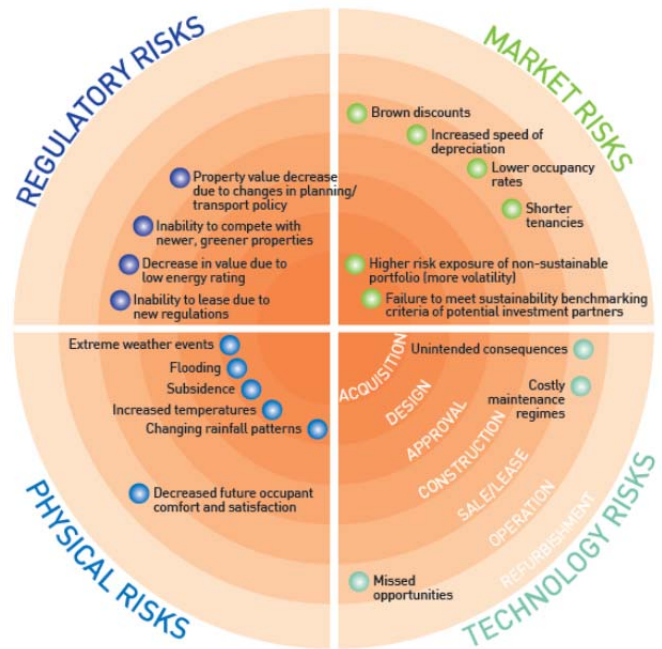


Fig. 2: The Business case of Green Buildings, A Review of cost and benefits for Developers, investors and occupants. , World Green Building Council)

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