ECONOMIC ISSUES ON GREEN OFFICE BUILDINGS IN MALAYSIA

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ABSTRACT

This research project produces results on economic issues on green office buildings in Malaysia. There are four main objectives in this paper which are to investigate the incremental construction cost, rental benefits, operating cost saving and increased in sale and value of green office buildings in Malaysia. Since the green building in Malaysia is an emerging market, the best approach is by using the qualitative approach which is multiple case studies. This research is using simple descriptive analysis to analyse the data. This research has found that there is the incremental construction cost for the green office building to be developed in Malaysia and it varies according to the level of certification which is around 5% to 15%. In terms of rental benefits, the green office buildings fetch higher rental rates around RM0.50 to RM2.25 per sq.ft. and higher rental growth around RM0.50 to RM1.00 per sq. ft. compare with the conventional buildings. The green office building also gives an advantage in term of operating cost saving around RM0.164 per sq.ft compare with the conventional building in the first year of operation. While in terms of increased of sales prices and valuation was not being proven yet since green office building is still an emerging markets.

Keywords: Green Building, Sustainable Building, Economic

1. INTRODUCTION

Nowadays, greenhouse gasses and ozone depletion have become one of the most important issues in the world. The buildings and built environment contribute significantly to greenhouse gas emissions and thus it needs to be re-designed to reduce the negative impact on the environment (KYOTO Protocol). The launch of National Green Technology Policy in 2009 reflects the government's eagerness to act as a catalyst for the development of green technology in Malaysia. Instead, the government also provides incentive through Budget 2010 in the form of tax exemption for building owners and stamp duty exemptions for buyers of properties that achieved GBI certification.

The previous studies on economic of green buildings in the mature market like United States, United Kingdom and Australia have found that the green buildings can achieve higher sales values, fetch higher rents and enjoy higher occupancy rates compared with non-green buildings. The studies also found that the industry has confirmed that 'green value' is starting to have an impact on property valuations through lower building operating costs, ease of sale and rent, tenant retention and improved overall occupancy rates (Green Building Council Australia, 2008; CB Richard Ellis, 2009; Pits and Jackson, 2008).

The question arises does the green building in Malaysia facing the same economic scenario like others countries? In Malaysia the green building is an area where there has been little research and analysis to date. This research paper intended to advance the debate on economic issues of green office buildings in Malaysia.

2. OBJECTIVES

The objectives of this study are:

(1) To investigate incremental construction cost of green office buildings
(2) To study rental benefit of green office buildings
(3) To examine operating cost saving of green office building
(4) To identified whether there is an increase in sale price and value of green office building in Malaysia

3. LITERATURE REVIEW ON GREEN BUILDINGS

Green building normally focuses on increasing the efficiency of resource use like energy, water, and materials while reducing building impact on human health and the environment during the building's lifecycle, through better sitting, design, construction, operation, maintenance, and removal. Green buildings should be designed and operated to reduce the overall impact of the built environment on its surroundings (Green Building Index, 2010).

Previous research shows that green rating tools were conceived to be able to assist architects, designers, builders, government bodies, building owners, developers and end users to understand the impact of each design choice and solution. Green rating tools by its nature and role is very dependent upon location and environment and thus climate (Pits and Jackson (2008); Bowman et al(2008); Eichholtz et al (2009); Miller et al (2008); Buttimer and Ott (2010); Lowe (2007)). The famous green rating tools across the world are as follows;

- Building Research Establishment Environmental Assessment Method (BREEAM), United Kingdom
- Leadership in Energy and Environmental Design (LEED), United State of America
- Green Star, Australia/ New Zealand
- Green Mark, Singapore
- Green Building Index (GBI), Malaysia

Malaysia's Green Building Index or GBI will be the only rating tool for the tropical zones other than Singapore Government's GREEN MARK. According to CBRE (2009), for commercial buildings, there are two ratings most commonly used at the design stage which are BREEAM (Building Research Establishment Environmental Assessment Method) and LEED (Leadership in Energy and Environmental Design). The assessment criteria and rating level for each rating tools were mostly quite similar in term of energy and water efficiency as well as environmental criteria. Regina (2009) compared the assessment criteria and the score of commercial property certified by LEED, Green Mark and Green Building Index (GBI). It shows that the weightage for each assessment criteria was slightly different.

3.1 Economic Issues on Green Buildings

There are several economic issues arise on green buildings such as the incremental construction cost, rental benefit, operating cost saving, increased on value or sales and others.

3.1.1 Incremental Construction Cost

The crucial issue on green building that always being debated by the construction industry is about 'cost effectiveness'. The issues on what market will offer for incurring the cost of developing sustainable or green buildings become one of the most important issues. Developers, investors and tenant are always ensuring the profitability of the project. They will only build, buy or lease green buildings if the performance and value for money which at least comparable with and preferably superior to a conventional building. This raises the thorny issue of money on how much do green properties cost to be built?

Previous research revealed various degree of percentage on incremental construction cost. Even in some mature markets, green building can be built without any incremental construction cost.

BCA (2011) study in Singapore shows that the green premium is different according to certification level. The average green premium for gold is around (1 to 2%), while for platinum is 2 to 8. Similarly, CB Richard Ellis (2009) conclude that building a green building for basic certification need not cost significantly more than a standard building. However, for higher accreditation is likely to add between 5% and 7.5% to construction cost.

In Australia, Langdon (2007) report result shows that there is a 3% to 5% premium for a 5 Star building, with an additional of 5% for a 6 Star building. The report notes that standards in the country have been set so that reaching 4 Star

is usually achievable. Rawlinson and Langdon (2007) report concludes that a 6% premium is due to sustainable design features for the building.

In earlier research, in US, Kats and Capital (2003) assessed a number of constructed green buildings to determine financial benefits as well as initial costs. The report compares original budgets to completed budgets to calculate the green premium. Result revealed that green adds on average about 2% to the original cost of a building. LEED was used as the measurement of green. Similarly, US General Services Administration (2004) agreed that green cost premiums could range from about 1% to 8%, depending on the level of LEED achieved. Industry Canada (2005) research shows that green buildings have a higher first cost, due to longer design times and use of 'nonstandard' materials or systems, but that long term cost benefits (money saved on energy, water and etc) outweight this first cost premium.

Meanwhile, study by Matthiessen et. al (2004) shows the point-by-point assessment of the cost premiums associated with LEED. It shows there is no significant increase in construction cost. Next study by Mattiessen et al (2007) report concludes that project continues to achieve LEED standards within their established budgets, despite the recent dramatic rise in overall construction costs. It shows that there is no significant difference in average costs for green building as compared with non green building.

The previous studies therefore suggest that achieving basic certification may cause incremental construction cost of about 0% (no cost) to 2% especially if the green building started as early as the design stage. While, the higher standard of green certification building may increase the construction cost of between 5% to 8%.

This research decided to use case study approach to investigate the incremental construction cost of green from the original project budget or original anticipated cost of the project due to limited data of green office building in Malaysia.

3.1.2 Rental Benefit

Since the initial construction cost might be higher for a green building compared with the conventional one, the owner or developers might expect some reward on rental benefits. It proven by Cushman and Wakefield (2009) survey shows that there is increasing evidence that tenant view sustainability as a determining factor in their property decisions with large companies leading the way.

Chappel & Corps (2009) in US/Canadian investigate by using three different case studies. This article finds that green building benefit from enhanced occupancy rates and speed of leasing. However, in terms of lease terms the properties were competitive with local comparables.

Eichholtz et. al. (2009) used regression analysis of rents from a significant sample size of over 8000 properties. The results suggest a clear rental premium of 2% for building with green rating than those for comparable buildings located

nearby. It is also consistent with earlier indicators that green buildings command higher occupancy rates. Next study by Eichholtz et al (2009) study revealed that the evidence supported a rental differential for Energy Star certified buildings but no such premium for LEED rated buildings.

Conversely, Wiley et. al. (2008) found out that the modeling results provide evidence green-labeled building achieve higher rents (8% Energy Star & 16% LEED) and higher occupancy rates. Similarly, CoStar Group (2008) compared the 223 building rated using Energy Star compared with 2077 Non-Energy Star buildings. The analysis of the samples showed that; the more energy efficient green buildings attracted rents per sq. ft. that was around 6% higher than traditional buildings; over the fifteen months analysed, the average rent on the green building rose by 8.2%, compared with 7.6% growth in the traditional buildings. On similar note, DTZ Research Australia and New Zealand (2008) report looks at three case studies and the research estimated that the leasing campaign resulted in an additional 10 to 15% in rent.

Lynch (2005) study found that key to office performance are tenant retention, cost saving and employee productivity. While, Ellison and Sayce (2006) concluded that sustainability give an impact upon worth through five main conduits; rental growth, depreciation, cashflow, duration to let and duration to sell. Gottfried (2006) research in US market found that the green building increased occupancy ratio increased by 3.5% and rent ratio increased by 3%.

Meanwhile, CB Richard Ellis (2009) study concludes that in the percentage terms, the rent additionally is of the same order as the excess development cost for green buildings (2% to 6%), suggesting that some additional premium may need to accrue from yields paid in the investment market.

As a conclusion on the above studies, the green building definitely fetches higher rents (2% to 16%, depending on the certification level), better speed of leasing, better tenant retention and higher occupancy rates in the investment market.

Due to limited data on multi-tenanted green office buildings in Malaysia, this research decided to use comparative study of the green office building with the conventional building nearby to further investigate on rental benefits.

3.1.3 Operating Cost Saving

The relationship between higher initial cost of construction and lower cost of running the green building through tenants' ability to pay higher rents is keys to understanding the viability of pursuing green developments. In typical office building, energy efficiency represents 30% of operating expenses that making it the single largest cost item and potentially at least a substantial element of manageable expenditure (Eichholtz et al, 2009; CB Richard Ellis, 2009).

As conclusion, the operating cost saving can be summarised as follows (Shiers (2000), Kansal and Kadambari (2010), Nalewaik et al (2009), Keeping and Shiers (1996), Heerwagen (2002), Mills et al (2003), Kozlowski (2010);

- Energy cost (electricity and fuel bills)
- Maintenance, Repairs, Reserves for replacement (maintenance cost)
- Water consumption (water and sewerage cost)
- Legal and Insurance cost
- Janitorial Expenses, trash collection, supplies costs

Kats (2003) report concludes that financial benefits of green design are between $50 and $70 per square foot in a LEED building, over 10 times the additional cost associated with building green. The financial benefits are lower energy saving, waste and water costs, lower environmental and emissions costs, lower operational and maintenance costs, increased productivity and health. Kats also conclude that data demonstrate that building green is cost-effective for the projects which start 'green' design early in the process. Gottfried (2006) also agreed that green buildings operating cost decreased by 8% to 9% in US market.

This research decided to use Kats (2003) approach by using comparative study of the green office building with the conventional building nearby to further investigate whether there is any operating cost saving.

3.1.4 Increased on Sale Price and Value

In a mature markets like United States, United Kingdom and Australia have found that the green buildings can achieve higher sales values and have an impact on property valuations (Green Building Council Australia, 2008; CB Richard Ellis, 2009; Pits and Jackson, 2008).

Gottfried (2006) research in US market found that the green building values increased by 7.5%. Meanwhile, CoStar Group (2008) study that based on database of office buildings shows some evidence that greener buildings are being valued more highly than conventional building. The analysis of the samples showed that; the green buildings appeared to secure a sale price premium of around 9% in 2005 and as much as 30% in 2006. Wiley et al (2008) examines the models CoStar data and estimates that sale premium of $30/sq.ft & $129/sq.ft respectively could be achieved.

Meanwhile, DTZ Research France (2009) analyse the presales of rated and non rated buildings. The findings show that rated buildings achieve higher level of value. Eichholtz et al (2009) research findings also showed a premium on the selling price of green buildings but from a much smaller sample.

This research decided to use the same approach used by the previous study which is by comparing the analysis of sales of green project with the conventional building nearby to identify the increase on sale price and value of green building

4. METHODOLOGY

This research employed as qualitative approach by using the case study analysis. In the first phase, the literature review from previous studies, technical papers, reports, property news was used to understand the subject matters. Then, attended the seminar and workshop in Green Building Index Sdn Bhd to further understand on the scenario of green building in Malaysia.

The data collection of certified green office buildings in Malaysia was conducted through certified organization such as Green Building Index (Malaysia), LEED (USA) dan Green Mark, BCA (Singapore). Form D submitted to NAPIC also being used to get the rental data. This research also incorporates the rental survey from Rahim & Co.

The instrument used in case study analysis is Data Collection Form divided according to 6 sections such as follows:

- Section 1: Respondent Profile
- Section 2: Building Profile
- Section 3: Construction Cost
- Section 4: Building Operating Cost
- Section 5: Rental Information
- Section 6: Interview Questions

Pilot test on 3 green office buildings have been conducted to test the instrument. The result of the pilot test was analysed and the amendment to the instrument was done. A semi-structured interview was used together with data collection form to get all the related information for this research. The respondents involved are GBI Facilitator, Quantity Surveyor, Project Manager and Project Engineer.

The detail case study analyses were conducted at 10 green office buildings in Malaysia. The data was analysed by using simple descriptive analysis through SPSS software and Microsoft Excel. The result was presented on chart and table.

5. RESULT AND DISCUSSION

5.1 Incremental Construction Cost

The first issue on how much do green office building cost to be build or percentage of incremental cost can be identified by using the certified calculation on green cost sum that can be collected from the owner of the building or organization who certified the building.

Table 1: Incremental Construction Cost

	LEED IIIIL(US)	GreenMark (Singapore)	GBI (Malaysia) – Not verified
Certied	*1 - 3*	*0.3 - 1*	5 – 8
Silver	*3 - 7*	*1 - 2*	8 – 12
Gold	*5 - 10*	*1 - 3*	12 – 15
Platinum	*8 - 15*	*2 - 8*	> 15 (Verified: 12%)

Source: Enermodal Engineering Denver (USA), BCA Singapore (2011) and GBI (2009).

In Malaysia, it can be identified through Green Building Index for building certified by this organization. GBI has being given the mandate to check and verified the green cost so that the owner or buyer can claim from the incentive provided by the government. The green cost also being evaluated twice which are during design stage and verification stage. This research agreed with Eang (2008), US General Services Administration (2004) and Kats and Capital (2003) studies that show the green premium is different according to certification level.

This research found that, the owner of the building normally claim incremental construction cost of 5% to 8% higher than certified by Green Building Index Sdn. Bhd. Further investigation from the interview with the GBI and owner revealed that it happen due to several reasons either to claim more incentives or to incorporate other cost like fees that was not considered in the incentive.

Meanwhile, interview with building owner in Malaysia certified by GreenMark found out that the incremental construction cost also slightly higher for gold certification at 2% more than estimated by GreenMark. It happens due to the differential in building design and features. This result supported the study by Rawlinson and Langdon (2007).

Interview session with GBI in 2011 also found that there is only one green building that has gone through verification stage and the incremental construction cost is slightly lower from estimation during design stage which is for platinum with more than 15% to 12% only. GBI expect that incremental construction cost will slowly reduce after more suppliers produced green technology materials for construction activities.

Through the interview with owner and GBI, the payback period from the construction of green building mostly less than 7 years for gold certification.

Table 2: Payback Period

	LEED	GreenMark
Certied	Under 3 yrs	2 - 5 yrs
Silver	3 - 5 yrs	2 - 6 yrs
Gold	5 - 10 yrs	2 - 6 yrs
Platinum	10 + yrs	2 - 8 yrs

Source: Enermodal Engineering Denver (USA) and BCA Singapore (2011)

This research also found that the incremental construction cost of green building varies according to the green building due to different green cost item per building. The comparison with other building might not be the best approach to get the green cost. The best way was actually based on the green cost of the building itself.

Detail case studies by this research on the incremental construction cost of the green office building with the same level of certification and certified by the same organization revealed the different. Building A in Kuala Lumpur revealed that energy efficiency criteria are the major factors influence the construction cost at 49% due to building materials like double glaze window, horizontal sun shading and wall with back pan insulation. While Building B in Selangor shows that 57% of the construction cost comes from innovation

criteria that involved thermal storage system and RC storage tank. The energy efficiency is the second higher cost after the innovation.

The results shown in this research is against the previous research done by a study by Matthiessen et al (2004/7) and CB Richard Ellis (2009) where there is no significant increase in construction cost to built green building.

This research has found that to build a building with green elements and go through the certification will definitely incur extra or incremental construction cost. It happens because of criteria set and green building in Malaysia is still new and as an emerging market in Malaysia, the suppliers of building material need to import some renewable/ recycle material from other countries.

5.2 Rental Benefit

The result shows that green office building in Malaysia enjoy rental benefits more than conventional buildings. The rental of green office building is higher RM0.50 to RM2.25 per sq. ft compared with conventional building and it varies according to the location. The findings contrary with Eichholtz et al (2009) study that found out no such rental premium for LEED rated buildings. This research result on rental benefit consistent with Wiley et al (2008), CoStar Group (2008) and other researches across the board except with different rate of rental premium.

The rental growth within a year increased around RM0.50 to RM1.00 per sq. ft.. This research supported the findings by Ellison and Sayce (2006) concluded that sustainability gives an impact upon worth through rental growth.

In certain area the occupancy rate of green office building is slightly higher compared with conventional building. However, this research also found that the area with oversupply of office space in certain areas in Kuala Lumpur, the occupancy rate was quite similar with the conventional building. It was not fully consistent with Chappel & Corps (2009) articles that revealed green building benefit from enhanced occupancy rates.

In terms of the duration of rent or speed of leasing, this research found out from the interview survey, the 'green' has become the best seller or marketing strategy for the office buildings and this package has successfully attract more tenants especially from an international company. The duration to rent is faster compared with conventional buildings. It was in line with the finding by Cushman and Wakefield (2009).

However, this research cannot conclude on tenant retention or duration to let since the green building is still emerging in Malaysia.

5.3 Operating Cost Saving

Operating cost saving was the famous issue discussed by most of the owner or investor of the green office building. This research is using the comparative study of the green office building with the conventional building nearby. This research only capable of getting one sample case study since it is very confidential and difficult to compare. This research is comparing Building C with Building D at Bandar Utama, Selangor. Both of

this building was operated by the same company. However, Building C was completed in 2010 while Building D was completed in 2009. So, the comparison of the costing is based on the first year operation.

The result shows that green office building enjoys more operating and maintenance cost saving compared with conventional buildings. The operating cost saving of green building is RM0.164 per sq. ft for first year operation. Eventhough it looks small in per sq. ft but when it comes to total floor area, it can save RM105,206.16. The result also shows the most of the percentage of operating and maintenance cost can be saved through utilities that include electrical, sewerage and water bill.

Most of the literature analyse the operating cost saving after more than 10 years operate because their market have mature enough. Here in Malaysia, this green building is still an emerging market.

5.4 Increased of Sales Prices and Value

In terms of this issues, this research is comparing the analysis of sales of green building with the conventional building nearby. The transaction of green building in Malaysia is limited. So, this transaction was collected from one of the developers that involved in the big scale of green project development located in Bangsar, Kuala Lumpur. These involved transaction of the five green office buildings to a different buyer.

The green office buildings were transacted around RM713 to RM938 per sq. ft. Similarly, the conventional office building nearby was transacted around RM713 to RM958 per sq. ft according to the location. This transaction proved that there is no much difference between transactions of green buildings compared with the conventional one. It happens because of the green building is still new in the market. This result against all the findings from the previous studies that have found it can achieve higher sales values (Green Building Council Australia, 2008; CB Richard Ellis, 2009; Pits and Jackson, 2008). In the mature market, the green building secured a sale price premium of around 9% in 2005 and as much as 30% in 2006 (CoStar Group, 2008).

On positive note, the interview with the buyer of the green office buildings at that area found out that the benefit of green building have attracted them to buy those buildings.

In terms of valuation, the interview with several private valuers agreed that green is one of the building elements that need to be considered in the valuation. Due to limited data to proof on the increased in value, the valuer estimate around 5% increase in value for green buildings. It is in line with Gottfried (2006) research in US market found that the green building values increased by 7.5%.

6. CONCLUSION AND RECOMMENDATION

The first objective of this research paper is to identify incremental construction cost of green office buildings in Malaysia. The issue on how much do green office building cost to be build or percentage of incremental cost can be identified by using the certified calculation on green cost sum that can be collected from the owner of the building or organization who certified the building. This research also concludes that the incremental construction cost varies according

to the building. So, the comparison with other building might not be the best approach to get the green cost. The best way was actually based on the green cost of the building itself. The incremental construction cost was different according to the certification level which is from 5% to 15% maximum. There are also other cost involved in certification process such as professional fees to facilitator, commissioning and testing specialist and application, appeal and renewal fees. The payback period for the construction cost was less than 7 years.

Next, this research revealed that office building in Malaysia enjoyed rental benefits more than conventional buildings. The rental of green office building is higher RM0.50 to RM2.25 per sq.ft and the rental growth within a year is increase around RM0.50 to RM1.00 per sq.ft. In certain area, the occupancy rate of green office building is slightly higher compared with conventional building. In term of the duration to rent or speed of leasing, this research found out that the duration to rent is faster compared with conventional buildings. In terms of the duration to rent or speed of leasing, this research found out that 'green' has become the best marketing strategy for the green office buildings and it successfully attract more tenants especially from the international company.

While, in terms of operating and maintenance cost saving when compared with conventional buildings are around RM0.164 per sq. ft. This was the result of the first year analysis since green office buildings in Malaysia were just completed in 2010. The major cost that can be saved is utility cost.

Lastly, the transaction of green office building in Malaysia proof that there is no much different compared with the conventional building. It happens because of the green building is still new in the market. However, the buyer of the green office buildings agreed that the benefit of green buildings have attracted them to buy those buildings. In term of valuation, valuers agreed that green is one of the building elements that need to be considered in the valuation. At this moment, the valuer estimate about 5% increased in value for green building.

At this moment, the valuation may consider all the economic issues affect the green office building and the available information in the market. The suitable methods to be used for valuation are either by investment method or cost method. Comparable may not be the best method to be used since there are no much transactions or evidences in the market.

The result of this research is only on preliminary stage, since green office building is an emerging market in Malaysia, further research needs to be done to review and to get better result.

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