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Soft Cost Elements That Affect Developers' Decision to Build Green

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***Abstract*—**Despite all the hype about green building, many developers are still resistant to the idea of building green due to the common perception that green building construction is expensive. This contradicts with scholarly findings that identify only a marginal cost premium or none at all given that green design is considered during the design process and planning stage. Nevertheless, cost implications continue to become an issue when deciding to build green. The planning stage is of strategic importance as decisions made at this early stage would influence the project cost thereafter. Using analysis of existing literature, the paper identifies six elements of soft cost that are considered in the planning stage. The elements include consultants, green building consultant, certification, commissioning, market, and tax. Out of the six elements, commissioning represents the bulk of soft cost for buildings seeking green certification. The study concluded that, although hard cost may have a bigger impact on the project cost, but soft cost is the hidden cost which people tend to ignore. Poor consideration of soft cost during planning stage may lead to over-realistic expectations and ultimately, overlooked cost additions.

***Keywords*—**Green building, cost element, soft cost, developer decision.

I. Introduction

ENVIRONMENTAL enthusiasts have long argued on environmental issues resulting from the rapid growth of the building industry. Following this, green building concept was introduced to help minimize the impact of construction on its environmental surrounding and promote a sustainable environment for the future generation. There have been many interpretations of what a green building is. The most popular definition of green building came from the United Nations (UN) World Commission on Environment and Development's 1987 Brundtland Report, which defined green building as a "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The definition was endorsed by the UN World Summit on Social Development in Rio de Janiero in 1992, who affirmed that "economic development, social development and environmental protection are interdependent and mutually reinforcing components". In 2002, the World Summit on Sustainable Development established three key objectives of sustainable development, which are to eradicate poverty, protect natural resources, and amend unsustainable productions and consumption patterns [1].

The Governor's Green Government Council [2] described green building as "a building whose construction and lifetime operation assure the healthiest possible environment while representing the most efficient and least disruptive use of land, water, energy and resources." The U.S. Environmental Protection Agency [3] explained green buildings as "the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from sitting to design, construction, operation, maintenance, renovation and deconstruction." Source [4] classified green building as a structure put together from healthy materials that minimizes waste and environmental impact, while maximizing functionality and efficiency. It takes into consideration the place, design, process and lifespan of the building. In Malaysia, the GBI Organisation [5] defined green buildings as a building that optimizes the efficient use of resources while reducing building impact on human health and environment during the building's lifecycle.

Generally, green buildings are intended to address three major issues i.e. people's entitlement to justice and rights; elimination of environmental degradation; and protecting future generations from impoverishment as a consequence of today's actions [6], [7]. In a nutshell, green buildings offer a better balance between the built environment and natural environment to meet the needs of present and future generations. Hence, this concept has been widely accepted across the globe in support of safeguarding Earth's natural resources with buildings that are environmentally friendly.

In line with the phenomena of promoting green construction, green enthusiasts have pushed green buildings as the way forward to a sustainable future. However, many developers are found to hesitate from entering the new market due to the higher initial costs and extra risks. Seeing that the cost factor seemed to be the main obstacle in tapping the green market, researchers have thus conducted various studies on green building cost but were mostly found to focus on hard cost elements using IRR and NPV calculations to justify life cycle costs. Although this works, an important factor i.e. soft cost element is neglected in the analysis of green building cost and its relationship with developers' decision to build green.

A study is being conducted to investigate the perspective of building stakeholders, namely developers, and depicts the role of soft cost elements in the consideration of green building

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implementation. In line with this study, this paper discusses the elements of soft cost, and explores the factors that affect market considerations for green building investment. It is essential to study these often-overlooked considerations of cost to understand the business opportunities of green building and pave a better way for green building development.

II. Green building cost

The subject of green building cost is repeatedly argued by scholars and industry practitioners alike. Many scholars have reported a cost premium, albeit small, within 1 to 4 percent of green building construction cost [8]-[12], while some argue that green buildings offer no cost difference at all if green design was well considered in the early design process and planning stage [13]-[15]. Sources [16]-[18] asserted that decisions made during the planning and design stage would influence the construction project activities and cost thereafter, making early commitment to going green imperative so that decisions are made to the best interest of the client and subsequent activities are planned in line with this aim [19]. In contrast, industry practitioners continue to identify expensive cost premiums and a long payback period to compensate their initial investment [8]. The belief that green design is something that gets added to a project continues to support the widespread perception that green design is substantially more expensive than conventional design [9].

Most developers are found to be reluctant to practice green strategies due to the extra costs and risks of the new green systems [20]. This corresponds to [8] who analyzed that many practitioners tend to focus on minimizing short-term costs without considering the consequences in the long-term. Developers' decisions are always driven by profit hence, the idea of investing a large sum of money for a green building project often serve as disfavor. Many remain resistant to the idea of pooling a bigger capital for green building when a cheaper and easier alternative remains available. Due to this, many identify cost premiums as the primary barrier to invest in green buildings, and are unwilling to spend more money on upfront costs.

Previous scholar [8] discovered that 41 percent LEED points addressed energy efficiency and became the sole focus of most practitioners, when energy savings alone only accrue 11 percent of the whole life cost savings. On the contrary, 24 percent of LEED points addressed productivity and health issues when these costs make up 70 percent of all whole life cost savings. As this type of savings are difficult to measure and quantify, they tend to be ignored by practitioners. This is relevant to the principle of the Pareto Law which states that in any event, 80 percent of the effects come from 20 percent of the causes. Therefore, in the absence of this knowledge, practitioners tend to focus on the 80 percent of causes that only produce 20 percent of the effects, instead of the 20 percent of causes that produce 80 percent of effects. This becomes the root problem when deciding to invest in green.

Thus, the question persists, are these assumptions regarding green building construction cost true or merely perceived misconceptions? To date, no thorough research has been conducted to analyze green building cost elements. Most scholarly findings focus on green building life cycle cost, but do not analyze the breakdown of cost elements considered in the initial budget during the pre-construction stage.

Green building cost can be separated into hard cost and soft cost. Hard costs refer to those items required in the physical construction of a building, including architectural works, mechanical and electrical works, civil and structural works and others. Soft costs refer to items not directly related to the physical construction of the building, but are necessary in the administration of a building project [21]. Based on this principle, the author has revised the elements of soft cost into six elements, namely Consultants, Green Building Consultant, Certification, Commissioning, Market, and Tax. Refer to Fig. 1.

Although hard cost appears more prominent in the discussion of cost, soft cost is actually equally important as these are the additional costs elements unique to a green building. Despite being a comparatively smaller portion in the total cost amount, its actual value can be expensive and plays a significant role in the decision to build green. When we think about it, why would developers want to build a green building when the they know that they would have to pay more for consultants fee, an additional green building consultant, certification fee, and commissioning costs?

III. Six Elements of Soft Cost

A. Consultants

Since not many architects and engineers have the required knowledge to design green, green building design can be considered a specialized area. The need for longer design time and additional meetings to confirm design decisions impose additional fees to the design team. An intensive design exercise is also conducted to discuss issues pertaining to a particular green building rating system. Among the additional services of the design team include modeling the energy use characteristics of the building, and commissioning the HVAC system to make sure it functions according to design intent. As a result, design services for green building cost up to 10 percent extra than conventional buildings [15], [22], [23].

B. Green Building Consultant

When going green, an additional role of a green consultant becomes necessary to coordinate the design process and help the client make informed decisions to resolve conflicting priorities. This is apparent for all green rating systems and is engaged from qualified third party personnel from independent bodies. The fee for a green consultant is usually based on the number of hours needed to complete the project [24]. According to [25], their services include consultation on the business strategy and market penetration; consultation on realistic financial performance targets; advise green input and requirements; provide innovation and accreditation scoring; propose construction materials; provide internal scoring assessment; prepare necessary documentations, simulations and presentations for green building council submissions;

provide green building project management template; carry out periodical green building audit and feedback; and compile final documentation and presentation for accreditation.

C. Certification

In order to achieve certification for a green building, the building must first be registered with the respective certifying institution and a registration fee applies. In United States, the registration fee costs USD 400 for USGBC members or USD 600 for non-members. Certification fees vary depending on the scale of the project but the average certification cost for LEED is USD 2,000 [26]. In Malaysia, the Green Building Index rating tool is used for green building certification. The registration fees start from RM 5,000 for new building single residence to RM 45,000 for new building extra-large projects which include the cost for Design Assessment (DA) and Completion and Verification Assessment (CVA) [27]. In Singapore, BCA Green Mark rating system is used to evaluate a building for its environmental impact and performance. The BCA Green Mark assessment fee starts at $12,080 for new building small projects and can reach up to $26,130 for new building extra-large projects [28].

D. Commissioning

Commissioning, as well as energy modeling and documentation fees represents the bulk of soft cost for buildings seeking green certification [15]. Commissioning is the process of engaging a team of independent third-party experts to ensure the performance of building systems and equipment comply with LEED standards. This is done during the design phase of the project and performed on features and systems, including HVAC systems, energy efficiency technologies, lighting controls, and others. LEED includes building commissioning as a requirement to attain green certification. The GBI rating system however, does not mandate commissioning, but encourages it to enhance building performance [29]. According to [30] the average commissioning cost for LEED projects were found at $0.55 per square foot. This coincides with [31] who estimated the range of commissioning costs between 0.5 and 1.5 percent of construction costs.

E. Market

Stellios Plainiotis, the managing director of environmental design and engineering firm, Neapoli Sdn Bhd, stated that the green building market is quickly gaining popularity around the world as increasing demands for green building products and technologies continue to drive the market. This is proven in a report by the Singaporean Responsible Research Pte Ltd which showed improvements in sale price of green buildings by 16 percent and rental yield by 6 percent. Similarly, the Malaysian National Property Information Centre, Finance Ministry reported a leap in rental rates for green office buildings compared to their conventional counterparts [32]. The Malaysian Institute of Architects President, Saifuddin Ahmad noted this increasing trend for green building development after the Prime Minister Datuk Seri Najib Razak announced the 100 percent tax exemption to owners of GBI certified buildings for additional expenditures incurred to achieve green certification The GBI certification process involves three steps, namely application and registration; design and assessment; and completion and verification [33].

F. Tax

Tax exemption is one of the benefits of going green provided by the Government of Malaysia to support green building development [34]. This initiative was made effective since October 24th, 2009 until late December 31st, 2004. Owners of GBI certified buildings are given 100 percent income tax exemption on additional capital expenditure to achieve GBI certification. This sets off the statutory income for each year of assessment and can be claimed once only upon receipt of the GBI certificate. Additionally, stamp duty exemption is given to buyers of green buildings and residential units with GBI certification as an inducement and reward for supporting green building [35], [36].

IV. Discussion

It was found that most scholars focused their research on hard cost when discussing cost of green building. This is due to the more significant cost impact from hard cost elements. Hence, it makes perfect commonsense to concentrate investigations of cost in hard elements. To date, limited studies have discussed on soft cost issues. However, although hard cost may have a bigger impact on the project cost, but soft cost is the hidden cost which people tend to ignore. Poor consideration of soft cost during planning stage may lead to over-realistic expectations and ultimately, unnecessary cost additions. Soft cost is important to understand the essentials of green building cost as these elements outline the difference between green building and conventional building.

This review paper revises the elements of soft cost from [21] and intends to investigate the direct relationship between soft cost elements and developers' decision to build green, as shown in Fig. 2. Developers' decision is profit-oriented; hence this study looks at the elements from a cost perspective to understand how these elements may influence the developers' decision during the early planning stage. Consultants fee for green buildings are relatively higher than conventional design due to the extra time and services required of the consultants.

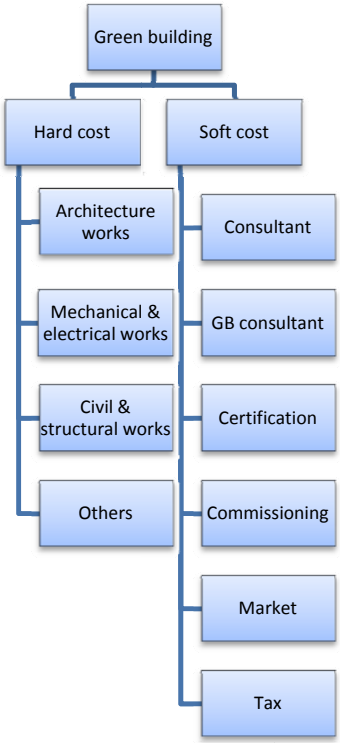

Fig. 1 Breakdown of green building cost elements Source: Author (2013)

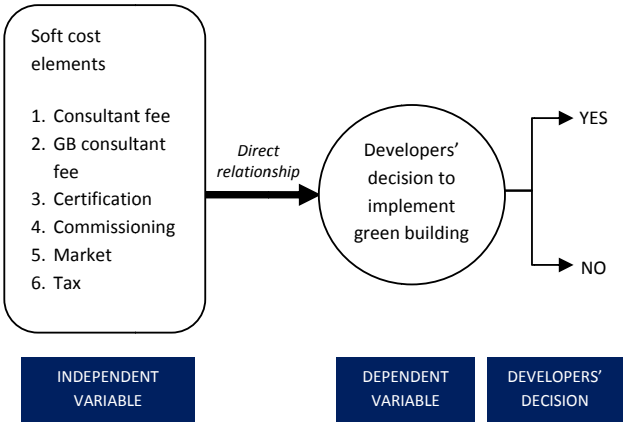

Fig. 2 Relationship between soft cost elements and developers' decision Source: Author (2013)

The consultants also need to be experienced in green design or possess adequate green design knowledge so as to be able to deliver the design intent to the best interest of the client. Due to this, limited numbers of architects and engineers are able to take on green building projects, making them high in demand and thus, expensive. This may discourage developers from building green.

Green building consultant is an additional requirement and therefore, additional cost to green building cost. Their fee depends on the number of hours they expect to provide their services for the project. Hence the bigger the project scale, the more expensive the green consultant fee. Their role is to provide consultancy and assist in the delivery of the green building so that developers make informed decisions and comply with green building standards. Since this imposes additional cost and obligations to the developer, developers may be dissuaded from deciding to invest in green.

To be certified green building, developers or owners are required to register the building with a selected green rating system upon which, a registration fee is charged. The registration fee includes the accreditation process and is charged according to the building category. In case the building does not achieve certification and would like to appeal, additional charges apply. Developers may be put off with this certification process in which buys in more time and capital cost.

Commissioning imposes the highest amount of soft cost to green buildings and is also charged according to the size of the project. Independent green commissioning bodies need to be engaged for the purpose of ensuring the green features and green technologies installed perform to the expected standard. Depending on rating systems, this process may be mandatory or optional. However, this process has proven to be cost beneficial and therefore highly encouraged for securing successful performance of the building. Non-green buildings may also engage this process.

The market for green buildings has gained widespread popularity around the globe as more people begin to realize the importance of green buildings. Hence, this serves to developers favor as sales for green properties are automatically stimulated. The various incentives provided for green building owners help to create a healthy trend in green building market. Despite the additional costs imposed on developers as mentioned previously, the payback period for redeeming their initial investment should be shortened with the positive sale opportunities.

Lastly, tax incentives provided by the Government of Malaysia are aimed to support owners of GBI certified buildings as well as buyers of green properties. This heightens green building market and encourages more sale opportunities, as well as compensates the developers' high initial investment.

Many factors are considered in the decision making process of building green. However, by neglecting to consider these soft cost elements in decision making, an impaired justification to build is concluded based on insufficient information. Often, this is caused by inaccurate cost estimations as developers fail to consider important cost elements. Many times, these soft cost elements are the cause of cost additions because developers do not consider their cost impact prior to construction. Consequentially, this results to cost overruns and budget bursts. In conclusion, soft costs are the fine elements of costs that need to be attended to during early decision stage so that developers may make clear justifications to build and are not startled with unforeseen costs.

V. Further Study

Upon identifying the soft cost elements discussed above, the author intends to measure each element's influence level on the developers' decision. The next stage of the study would be to investigate the validity of the relationship model via structured interviews with practicing developers. Ultimately, the study intends to propose a framework for managing soft costs so that decision to build green is made easier.

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