A preliminary exploration of the barriers of sustainable refurbishment for commercial building projects in Malaysia

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Abstract

Malaysia is one of the developing countries that faced frequent and serious floods in recent years. Sustainable refurbishment seems to play an important role to fight against the climate change. Additionally, sustainable refurbishment approach is the greatest potential ways for reducing carbon dioxide emissions. Existing commercial buildings in Malaysia have been found for one-third of the total electricity consumption. However, the amounts of sustainable refurbished buildings listed in the Green Building Index (GBI) certified are still considerably lower and not fully explored. That is, this research aims to identify the potential barriers that hinder commercial building owners to implement sustainable refurbishment and to determine the drivers that could improve sustainable refurbishment implementation in Malaysia. The qualitative data were collected through semi-structured interview with an experienced commercial building manager in Kuala Lumpur. The content analysis used in utilizing the entire dataset to identify underlying themes presented through the data. The result indicated that the key barriers of sustainable refurbishment are the higher cost of sustainable refurbishment than traditional methods and lacking of sustainable awareness among Malaysian. This preliminary research also found that the drivers that could improve sustainable refurbishment implementation are able to enhance their corporate image and to reduce the environmental impact. The findings of ongoing research can be beneficial for building owners to deliver their refurbishment projects with a green awareness and environmental considerations in the future.

Keywords: Sustainable refurbishment; commercial building; Malaysia; sustainability; barriers; and drivers.
1. Introduction

Issues on climate change and global warming have been received a wide concern in Malaysia. Transformation existing commercial building to enhance energy efficiency objectives is one the solution ways. Additionally, refurbishment of the existing building becomes more significant with many aged buildings now become less efficient and ready to be upgraded. By considering this scenario, sustainable refurbishment is needed and it plays as an important role in solving climate change. The approach seemed to hold the greatest potential for reducing $CO_2$ emissions in the short to medium term. There are several countries consider sustainable refurbishment to be an effective approach to reducing the carbon dioxide emissions from the existing buildings.

In the year of 2009, Malaysia launched the National Green Technology policy. The objective is to minimize the growth of energy consumption while enhancing economic development[1]. In spite of all the efforts that have done by the government, commercial buildings are still accounted for 39 terawatt hours ($10^{12}$Wh) of electricity, which also equivalent to one-third of the total electricity consumption in Malaysia[2]. Electricity consumption is considerably related to the economic activity and hence as the electricity consumption will continue to grow as the country continuing to develop. This will also be translated into a continuous increase in $CO_2$ emission if there is no further action taken. Hence, this paper focuses on examining barriers and drivers in undertaking sustainable refurbishment project, particularly for a commercial building in Malaysia that retrieved through preliminary interviews. The findings of this research will contribute to the construction industry, which could helpful to promote sustainable refurbishment implementation in developing countries such as Malaysia. Besides, this paper also significant to the industry players as it determines barriers and drivers in enhancing sustainable refurbishment, particularly for commercial buildings that are still not fully discovered yet.

2. Relevant literature review on sustainable refurbishments development

This section explains briefly sustainable refurbishment concept, barriers, and drivers of sustainable refurbishment projects. Additionally, a definition of each main terms used throughout the study is also discussed in this section in order to highlight research gaps.

Climate change has become one of the most significant effects and it has been receiving a wide concern in Malaysia. The sustainable refurbishment is one of the ways that can prevent climate change by creating a positive effect on the environment [3]. According to the World Commission on Environment and Development (1987), sustainability is the capacity to meet the needs of the present without compromising the ability of future generations to meet their own needs. The concept of sustainable development has received a major concern in many countries including Malaysia. Furthermore, since 2009, Malaysia construction industry has been focusing and moving towards sustainable construction. However, this approach seems to suffer as it only focused on developing new green buildings, but the sustainable refurbishment of the existing buildings are still not extensively explored. The GBI certified summary data supported that only 9 existing buildings that are certified after sustainable refurbishment [4], although there are at least 1000 refurbishment projects each year for the last 3 years [5].

There are several studies to define the meaning of sustainable refurbishment. The refurbishment is defined as the extending the usefulness of existing building through the adaptation of their basic forms in providing a new or updated version of the original structure [6]. Similarly, previous research added that refurbishment as the extensive renew or modification of secondary elements of a building that may be required to adapt the structure to a new purpose [7]. Besides, there are several other terms that similar to define refurbishment such as conversion, retrofit, rehabilitation, adaptation, renovation, and restoration. As for this study, sustainable refurbishment is referred as upgrading works for existing building by considering sustainable factors namely economic, social and environmental.

Although there is a large amount of refurbishment projects in Malaysia every year, yet there are only a few projects that employ sustainable way in upgrading the existing buildings. This result number of barriers that hinder commercial building owners from implementing the sustainable refurbishment in the projects. The barriers of sustainable refurbishment are including financial, technical, and social to country regulation on sustainable development. Previous studies determined that several barriers of sustainable refurbishment as shown in Table 1. It indicates that limited budget is the key barriers in undertaking sustainable refurbishment for the most of the countries regardless in developed or developing countries.
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