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**THE KEY CHALLENGES OF GREEN
RETROFITTING PROJECT (GRP)
FOR EXISTING OFFICE BUILDING
IN MALAYSIA**

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ABSTRACT

Built-environment is known as the largest provider of greenhouse gases (GHG), the culprit behind global warming and climate change. Countries worldwide have taken various measures to curb with the pressing matter by going green including new green buildings, renewable energy, sustainable resources and materials management and other countless measures. Nevertheless, the growth of new green building is only parallel to 1.5–2.0% of the existing building stocks or 50–100 years taken to replace the current existing building stock. The effort taken is not speedy and impactful enough though equally necessary as demolishing existing buildings for new green buildings is not financially and environmentally feasible. Ultimately, the most sensible way to reduce carbon footprint is through green retrofitting project (GRP) considering the large ratio between existing buildings and new green buildings stocks. Lamentably, the statistic showed that GRP globally is crawling slowly at 2.2% per year which is not helpful at all when Malaysia had aim to reduce the greenhouse gas emissions (GHG) intensity of GDP by 45% by 2030 relative to the emissions intensity of GDP in 2005. As for 2018, the number of Green Building Index (GBI) Non Residential Existing Building (NREB) certification in Malaysia stoop really low at only 13 numbers of certification. To top that, the lack of streamline and standardized process and tool had further threatened the effort to implement GRP. The closest voluntary mandate or GRP process at the moment is the MS1525:2007; Code of Practice on Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings with minimum requirements which does not serve the high standard of green building and not to mention that this standard is quiet general and only voluntary in nature. Therefore, in attempt to address the matter of the slow pace of GRP in Malaysia as well as the lacking in standard process for GRP in Malaysia, this research aim to explore the process of GRP, identify the challenges of GRP and determine the key challenges of GRP for existing office building in Malaysia. Primarily, this research employs quantitative method by means of survey questionnaire that were distributed among 847 GBI facilitators identified as the GRP stakeholders with response rate of 10.861%. Through desktop research mapping, this research was able to formulate five processes of GRP which is 1) GRP Setup, 2) GRP Audit, 3) Establish GRP Target, 4) Execute GRP and 5) Post GRP Assessment. Through desktop research mapping again, a total of fifteen (15) challenges from implementation view and twenty-nine (29) challenges from task view were able to be derived. These challenges were tested out in a questionnaire survey delivered through an online survey called Survey Monkey to the GBI facilitators. The results were analysed using mean scoring, to identify three key challenges of GRP from implementation view which is the complexity of existing building, lack of government support and unknowledgeable stakeholders. In terms of key challenges from task view for GRP are automatic monitoring system for atrium or windows, environmental sensitive management at sites, individual comfort control, green innovation, least chemical pesticides and building envelope to reduce OTTV. Further research recommended would be an in-depth study of green retrofitted existing building challenges by using case study method to capture and explore the challenges that a quantitative research could not identify.

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

It has been 2.5 decades since the Union of Concerned Scientist and more than 1700 independent scientist including the majority of living Nobel laureates in the sciences, dictated the 1992 “World Scientists’ Warning to Humanity” (Ripple et al, 2017). The purpose of the supplication is to call out for the humankind to curb with environmental destruction and cautioned that “a great change in our stewardship of the Earth and the life on it is required, if vast human misery is to be avoided.” (Ripple et al, 2017).

They were addressing in their manifesto that humans were on a collision course with the natural world that revolve around ozone depletion, the availability of freshwater, the depletion of marine life, the destruction of biodiversity, forest loss yet the ever growing human population (Ripple et al, 2017). Yet again in year 2017, the same notice was signed by more than 15,000 scientists from 184 countries to warn the humankind about the impending catastrophe and disaster that awaits humankind caused by their own hand. They had evaluate the human response pending to the 1992 warning and what had been found within the proximity of year 1992 to 2017 was far worse and devastating.

Though indirectly, being a part of the built-environment society, it is our duty to play a role in drawing attention to what we can do to play part in conserving our nature and environment. For the environmentally conscious industry players, proprietors, governments, developers and the rest of the stakeholders, green building is not a matter of choice or luxury but a necessity (Durmus-pedini & Ashuri, 2010).

There are two-folds in discussing the adverse impact of non-green existing buildings according to (Durmus-pedini & Ashuri 2010). The first impact would be in the form of pollutions from demolition waste if the existing building is to be replaced with new green building whilst the second impact is that the existing building would