

**STRATEGIES TO ENHANCE APPLICATION OF SIRIM
ECO-LABEL PRODUCTS IN CONSTRUCTION INDUSTRY**

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STRATEGIES TO ENHANCE APPLICATION OF SIRIM
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DEDICATION

*Dedicated to my beloved family for their love, support and
encouragement*

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In the name of Allah, the Beneficent, the Merciful

This project would not have been possible without the guidance and the help of several individuals who in one way or another contributed and extended their valuable assistance in the preparation and completion of this study. All thanks to the Almighty for His grace, I have completed this project successfully.

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ABSTRACT

Environmentally product appears growing steadily around the developed world and also some developing countries. The Malaysian government also has responded very positively to this matter. In 1996, Standards and Industrial Research Institute of Malaysia (SIRIM) launched the national eco-labelling program verifying products according to environmental criteria as tools and initiatives to express concern and support to sustainable development. Taking into consideration the infancy stage of the Malaysia green marketing initiative, this study therefore conducted with the aim to suggest possible strategies to increase the application level of eco-label product in Malaysian construction industry. Survey were conducted via questionnaire and interview method with respondents from various construction companies among construction players that have involved and experienced with green project. Data obtained were analysed using Average Index method. The result shown that, the application and awareness level among construction players were relatively acceptable which still can be enhanced with most of the significant strategies proposed.

ABSTRAK

Produk alam sekitar sedang kian berkembang di seluruh negara maju di dunia dan juga beberapa negara-negara membangun. Kerajaan Malaysia juga telah bertindak secara amat positif kepada perkara ini. Pada tahun 1996, Institut Piawai dan Penyelidikan Perindustrian Malaysia (SIRIM) telah melancarkan program pelabelan eko negara untuk mengesahkan produk mengikut kriteria alam sekitar sebagai alat dan inisiatif untuk menunjukkan perhatian dan sokongan kepada pembangunan mampan. Dengan mengambil kira inisiatif pemasaran hijau Malaysia yang berada di peringkat awal, oleh itu kajian ini dijalankan dengan tujuan mencadangkan strategi yang mungkin boleh meningkatkan tahap aplikasi bahan eko-label di dalam industri pembinaan Malaysia. Kaji selidik telah dijalankan melalui kaedah soal selidik dan temu bual dengan responden daripada pelbagai syarikat pembinaan di kalangan peserta pembinaan yang terlibat dan berpengalaman dengan projek hijau. Data yang diperolehi dianalisis dengan menggunakan kaedah Indeks Purata. Hasil keputusan menunjukkan, tahap aplikasi dan kesedaran di kalangan peserta pembinaan berada di tahap yang boleh diterima di mana ia masih boleh ditingkatkan dengan sebahagian besar strategi yang dicadangkan.

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LIST OF ABBREVIATIONS

4FDP81	Four Fuel Diversification Policy 1981
5FP2000	Fifth Fuel Policy 2000
ACEM	Association of Construction Engineers Malaysia
BEEZ	Building for Environmental and Economic Sustainability
BOMA	Building Owners and Management Association
BREEAM	Building Research Establishment Environmental Assessment Method
CIMP	Construction Industry Master Plan
CIDB	Construction Industry Development Board
CREAM	Information, communication and technology
GBI	Green Building Index
GEN	Global Eco-labelling Network
GGCS	Green Globe Company Standard
GTFS	Green Technology Fund Scheme
GRA	Global Research Alliance
HKGLS	Hong Kong Green Label Scheme
IGEM	International Greentech & Eco-Products Exhibition & Conference Malaysia
ISO	International Socialist Organization
LEED	Leadership in Energy and Environmental Design
NGOs	Non-governmental Organizations
PWGSC	Public Works and Government Service of Canada
SB	Sustainable Building
SC	Sustainable Construction
SD	Sustainable Development

EPSM	Environmental Protection Society Malaysia
KeTTHA	Ministry of Energy, Green Technology and Water
MGBC	Malaysia Green Building Confederation
MTHPI	National Green Technology & Climate Change Council
NDP80	National Depletion Policy 1980
NEEMP	National Energy Renewable Energy Policy and Action Plan
NEEMP	National Energy Efficiency Master Plan
NEP79	National Energy Policy 1979
PAM	<i>Persatuan Arkitek Malaysia</i>
REMAP	Renewable Energy Resource Map of Malaysia
SCP	Sustainable Construction Pattern
SIRIM	National e-Tendering Initiative
SIRIM	Standards and Industrial Research Institute of Malaysia
SPSS	Statistical Package for the Social Science
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
USGBC	U.S. Green Building Council
VOCs	Volatile Organic Compound
SUSDEN	Sustainable Development Network Malaysia
UKGBC	United Kingdom Green Building Council
UNEP-SBCI	United Nations Environment Programme-Sustainable Buildings and Climate Initiative
WAITRO	World Association of Industrial and Technological Organisations
WSSD	The World Summit on Sustainable Development

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CHAPTER 1

INTRODUCTION

1.1 General Background

In 1987, Brundtland Report was introduced and the term of 'sustainable development' was used to express the following definition 'the development that meet the needs of current people without affecting the future generations' (Brundtland Report, 1987). In other words, it is a sustainable development when current development meet its objectives without jeopardizing the future generation. More conference were organised after that in support of sustainable development such as The Rio Earth Summit in 1992 and The World Summit on Sustainable Development (WSSD) in Johannesburg in 2002. Topic such as Agenda 21 has highlight the need to request the government to integrate sustainable development into their national strategies and highlight the importance involving of private and public bodies in the process.

Many support came from various organisations to support and promote sustainable development. For example, there are UK Green Building Council (UKGBC) in United Kingdom, Department of Sustainability, Environment and Water in Australia, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in Germany, Environment Canada in Canada, Norwegian Climate and

Pollution & Norwegian Directorate for Nature Management in Norway, and many more agencies, organisations, and government bodies all around the world especially in developed countries.

In Malaysia there are bodies such as Malaysia Green Building Confederation (MGBC), Green Purchasing Network Malaysia, National Green Technology & Climate Change Council (MTHPI), Sustainable Development Network Malaysia (SUSDEN) and Environmental Protection Society Malaysia (EPSM) to support the Ministry of Energy, Green Technology and Water (KeTTHA) in strengthen and ensure smooth implementation of sustainable activities in Malaysia. Several commitments and incentives were introduced and implemented such as Copenhagen Climate Change Summit in 2009 by where Dato' Sri Najib Tun Razak explained up to 40% of emissions could be reduced in the gross domestic product (GDP) by the year 2020 compared to 2005. Besides that there are also National Energy Efficiency Master Plan (NEEMP), National Green Technology Policy, National Renewable Energy Policy and Action Plan, and United Nations Development Program Malaysia (UNDP Malaysia) among of the sustainable development strategies and actions taken by the government to promote sustainable concept in Malaysia. Moreover, bodies such *Persatuan Arkitek Malaysia* (PAM) and Standards and Industrial Research Institute of Malaysia (SIRIM) introduced Green Building Index (GBI) and Eco-label product which focus more to the material and product use in construction.

According to United Nations Environment Programme-Sustainable Buildings and Climate Initiative (UNEP-SBCI), buildings affect all energy related to greenhouse gas (GHG) up to 30% and also accountable for 40% of annual energy consumption globally. Besides that, a building that has average life span of 50 years is estimated to consume about 80% of energy when it is occupied throughout the building's lifetime (Carol & Brad (2014). These are facts regarding energy consumption which generally consists of operational and embodied energy. Operational energy is energy used to heat and cool premises, light rooms and run appliances in the premises. On the other hand, embodied energy is the energy required to construct and maintain the premises. Take cement for example, the

embodied energy of cement will include the energy required to process the cement, transport them, maintain them and all works associated including demolition and recycling (Carol & Brad (2014). The amount of embodied energy should be reduced because it will effects the energy consumption thus contribute to greenhouse gas emissions. Therefore, in response to reduce embodied energy, implementation of eco-label material in construction is highly suggested.

Eco-label in Malaysia start when the National Advisory Committee on Eco-labelling was formed in year 1992 and managed by Standards and Industrial Research Institute of Malaysia. In 2004, SIRIM has launched eco-labelling scheme where it has 37 criteria of sustainable materials and products available (SIRIM Berhad, 2012). Then, in April 2009, Green Building Index was introduced as measuring tools as one of the government's action to promote eco-label material usage in Malaysia (Tan, 2008).

Therefore eco-labelling is a critical issue that should be addressed more seriously in order to minimise the impact to the environment. More strategies and incentives from government and private bodies are necessary in order to introduce more eco-label materials and products in the future. This is to enhance the implementation of eco-label material in Malaysia construction practice.

1.2 Problem Statement

The president of Malaysia Green Building Confederation (MGBC) in 2001 stated that the revision to the Uniform Building By Laws (UBBL) Malaysia has been approved and slowly be gazetted by to each state individually. Currently there mandatory rules such as thermal performance of the building envelope, roof areas and rainwater harvesting are some of the rules that have been gazetted in three states which is Perak, Selangor and Johor. The enforcement is not as good if compared to Singapore where the Green Mark certification is mandatory for all new construction projects and this action may reflect the growth of green building effectively.

In SIRIM eco-label, currently there are 37 eco-labelling criteria involving materials and products that are sustainable to the environment (SIRIM, 2012). This number however is considered small compared to other country such as Germany that has about 12,000 products in 120 product categories. The small amount of materials and products available has indicated just how much of materials and products can be supplied by local supplier. The limited number of material supply will create difficulties for developer to obtain the material especially when then project is big and requires lots of materials. Besides that it will affects the choice available for construction players to select the green products to be used in their project. When the material is not there due to lack of demand, supply, awareness, promotions, and encouragement this will impact the frequency of that particular item be used in Malaysia construction.

Furthermore, most of design team, construction players and developer in this developing country do not familiar with green construction concept as there is lack of guideline, information about the product, function, ability, price and also uncertainty of legislation contribute to the challenges in implementing the sustainable construction (Gunther, 2003). Taylor (2010) identified a major failure consequence of the development has been that the construction players are unaware skills in optimizing energy use, life-cycle cost and comfort benefits in the building.

Santamouris (2007) added, even though lot of initiatives has been brought by many body locally and internationally, construction players still unaware of the green initiative. Naturally, construction players persist in the old ways and are reluctant to make the first move to new territory. Developer, on the other hand, is afraid that the building will cost more and take a longer time (Taylor, 2010). It requires awareness and knowledge from all construction players to explore new territory in construction approach and prepares to adopt new products, ideas and practices. As stated by Ofari et al., (2001) the approach of sustainable construction and with its underlying principles provides a comprehensive guide to enable the construction players to be more responsible to the environmental protection needs without neglecting the social and economic needs in striving for better living (Yates, 2001).

Lack of above information has made them become unaware about the importance of implementing the green approach concept in their construction. Supposedly, the construction players whom play the most important role in construction should be fully aware about green construction as they are the one who will shape the construction pattern in this country. With this scenarios there will be potential where developer against to adapt eco-label material to be part of their construction without thinking about the consequences that could impact the environment. McMurray (2009) found that financial issues, lack of knowledge and top management commitment were the most significant barrier on sustainable practices in Malaysia.

1.3 Aim of Study

The aim of this study is to determine the strategies to enhance the application of SIRIM Eco-Label products among construction players in Malaysian construction industry.

1.4 Objectives of the Study

In establishing the aim of the study, several objectives need to be achieved and the objectives are listed below:

1. To identify the application of SIRIM Eco-Label products in construction industry.
2. To determine the awareness of construction players in response to SIRIM Eco-Label products.
3. To propose strategies to enhance the application of SIRIM Eco-Label materials and products among construction players in construction industry.

1.5 Scope of the Study

Throughout the entire process of this study, there were several limitations imposed. Firstly, this study only takes consideration of construction players associated in construction industry within Klang Valley only. This is because Klang Valley is the most develop area compared to any other places in Malaysia comprising Kuala Lumpur, as well as adjoining with biggest cities and towns in Malaysia. This is the densest area in Malaysia with approximately 7.2 million (about a quarter of total population in Malaysia) and will rise up to 20 million by 2030. Rapid development in Klang Valley means that there is higher possibility to have more reliable and experience respondents.

The construction players were limited to developers, and as for consultants it is limited to architects only regardless whether from private or public sector. Architects and developers are the main targets because they are the decision-makers about what types of materials to be used and procured from the early stage of construction to the end. Their awareness is also important as it will reflect their decision-making of selecting construction products to be purchased for their projects.

Besides that, only eco-label materials and products that approved by SIRIM will be studied in this research. The products will only be covered the general criteria and not in depth into specification and detail for each particular product. There are 37 criteria available in SIRIM Eco-Label Scheme, however only 12 products criteria will be studied as the other criteria are not for meant for construction use.

1.6 Outline of Chapters & Brief Research Methodology

Figure 1.1 below shows the outline for each chapter on how this study will be conducted in order to achieve the aim and objectives for this study.

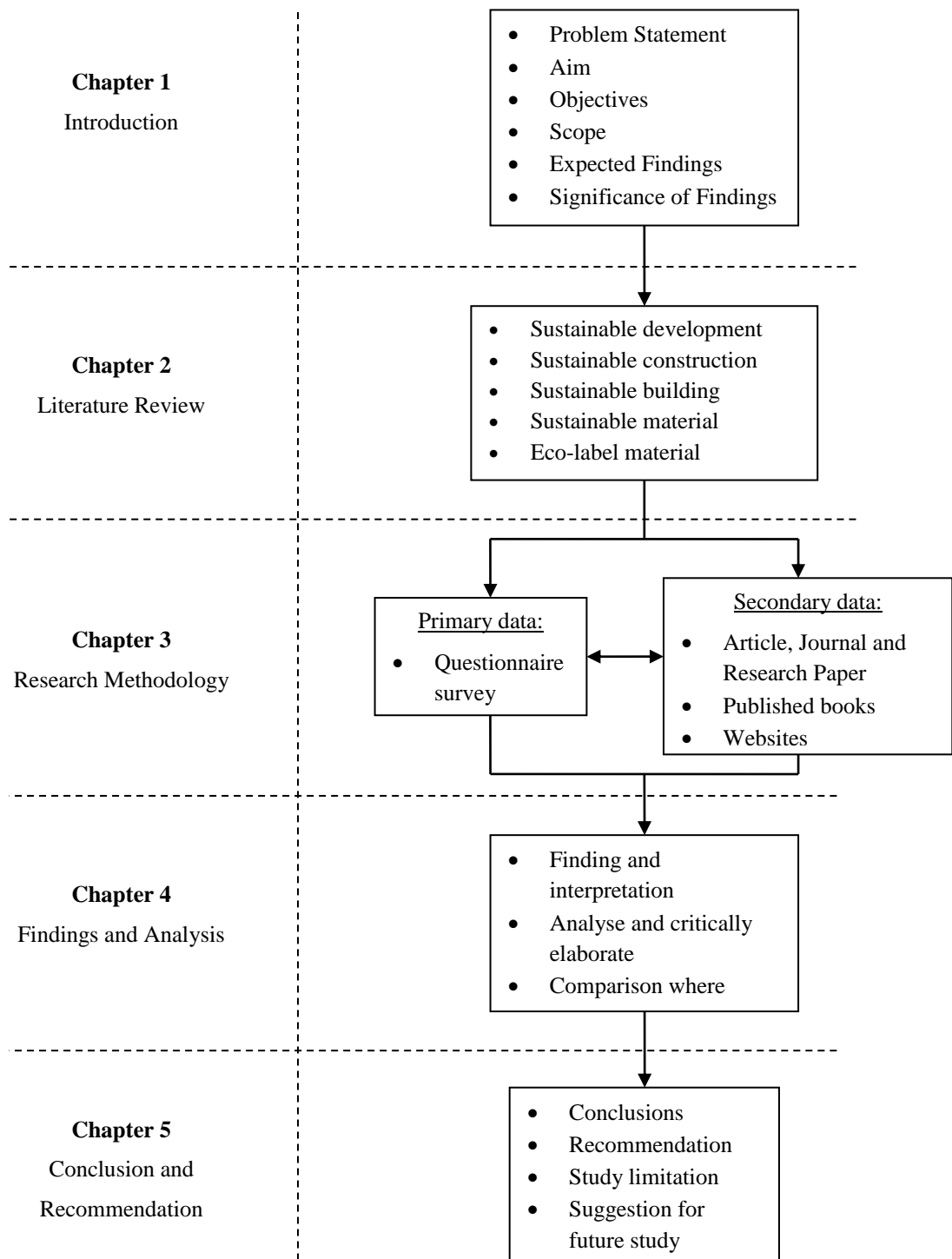


Figure 1.1 Chapters outline

1.7 Expected Findings

Prior to this study, several anticipations from respondents were expected and this will help for better analysis in this study. The first expected finding determine the frequency level of procuring eco-label products in construction industry. Therefore, the result give a basic idea of which criteria of eco-label products often used by construction players in sustainable building project in order to measure the application level of eco-labels products in construction industry.

The second expected finding provide an understanding about the awareness of construction players towards eco-label products in construction. As stated before, the scheme is still new in this country and construction players' awareness about eco-label products need to be distinguish. The result indicate better understanding regarding their interest, knowledge, and understanding about eco-label products thus reflecting the acceptance and preference of the construction players. Obviously, construction in Malaysia is in need of good awareness among the construction players in order to make sure more sustainable buildings be built in future.

The last expected findings determine how the construction players might change their decision-making upon procuring construction products. With proper way to educate and proposing strategies to them, the construction players might change the way of their thinking about the importance of procuring green certified products as part of their construction in the future.

1.8 Significance of Study

This study assist the application of eco-label product usage in construction industry by suggesting various strategies to enhance its application with good understanding of the current application and awareness level of construction players. It is vital for the future of the industry as the natural resources to produce construction material and product are depleting and the environment is degenerating due to the impact of rapid unsustainable development. Besides that, a better quality and healthier construction practice can be achieved by using eco-label product as part of construction material for the building so that it benefit in the aspects of social, economy and especially the environment of the development.

1.9 Conclusion

In construction, using eco-labels certified products in building will produce high quality building, safe to the environment, and healthy to end user. The concept of green building can be said to be greener if the building is made up certified green products. However, without true understanding about eco-labels especially from key players of construction team, the benefits of eco-label products cannot be fully utilised in construction. Therefore, awareness, knowledge, skills and experience are needed among construction players in order to plan how to fully utilised green products in buildings for greater effectiveness and result towards achieving better and healthier buildings for current and future development without jeopardizing the future generations.

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