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Towards Sustainable Development in Malaysia: In the Perspective of Energy Security for Buildings

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Abstract

Malaysia's economy expansion has been powered by cheap oil making us too dependent and addicted on using fossil fuels. As a country that is primarily reliant on fossil fuels for generating its development, issues such as fossil fuel depletion and peak oil will threaten the development of this country. Oil depletion issue had risen rapidly throughout the globe and the quest for substitute fuels has never been as anxious as it is today. Energy security is in crucial perspective in order to prolong sustainable development in Malaysia. This paper will review the energy sources in Malaysia, the importance of energy security and prospective review of renewable energy towards sustainable development in Malaysia. It will show the impact of power blackouts to Malaysia and the importance of effective measure towards energy security for country's building stock. In order to achieve that, consideration on utilizing renewable energy as a backup energy for the nation is essential. At the moment, the highest potential of adaptable renewable energy for buildings in Malaysia can be gained from solar. Thus, it is important to value this natural energy which is environmental-friendly and abundant in Malaysia. The main objective is to acquire energy security for buildings in Malaysia.

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1. Introduction

Development in Malaysia has grow for the past 3 decades and spectacular landmarks, such as the Petronas Twin Tower, the Kuala Lumpur International Airport (KLIA), the Light Rail Transit (LRT), the SMART tunnel system and many more have been established admirably throughout the country. The gross domestic product (GDP) and Human Development Index (HDI) of Malaysia is also among the best in Asia. It has been proved that, GDP in Malaysia has improved after the implementation of National Economic Policy in 1971 by the former Prime Minister of Malaysia, Tun Abdul Razak [1]. Idrus [1] has reported that in 1975, Malaysia GDP per capita is USD1, 750 and had increased to USD 14,700 in 2009. Meanwhile, for HDI, Malaysia was ranked at 57th from 169 countries; with 38% increment from

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the year 1980 to 2000 [2]. This ranking is ahead from all other Asian countries.

Development in Malaysia started when the government enacted the Petroleum Development Act in mid-1974 [3]. Petroleum in Malaysia is controlled by Petroliaam Nasional Berhad (Petronas) and since the launch of the act, they has generated sufficient fuels supply for the whole country. This had led towards the development of Malaysia. Since the launching of Vision 2020 by Tun Dr Mahathir bin Mohamad in the year 1991 [4], Malaysia had gone through a process of rapid development. Buildings and infrastructures were built in larger scale throughout the country and the industries in property and real estate were expanded. Job opportunities grow and building stock increased throughout the country. High-raised buildings and housing sector were built tremendously through many cities in Malaysia, for instance Kuala Lumpur, Penang, Kuching and Johor Baharu. Due to this, the unemployment rate of people in Malaysia becomes low, which only averaged within 3.43% from 1998 until 2010 [5]. These scenarios are all due to the respect of development that has been powered by abundant fuel supplies. The question now arises as to whether these developments can be sustained despite of inconsistent fuel market in the future.

2. Literature Review

2.1 Buildings in Malaysia

Building sector in Malaysia has been expanded since 1970s, with the first skyscraper topped the Penang city, which is the 65-storeys of Komtar Tower building. The construction started at 1974 and completed in 1986 being among tallest building in Asia [6]. Since then, many high-rise buildings were built, for instance Maybank Tower Kuala Lumpur (50-storeys), Dayabumi Tower Kuala Lumpur (39-storeys), Menara Tun Mustapha Kota Kinabalu (30-storeys) and Malaysian proudest skyscrapers, Petronas Twin Tower Kuala Lumpur (88-storeys).

As the economic growth increases, the government of Malaysia has helped many local contractors to gain interaction with foreign firms. By late 1980s, local firms has started to operate tentatively with international linkages and by the early 1990s, these firms had progressed rapidly [7]. This has helped to cater the demand on housing for people and influenced the housing sectors to be increasingly prosperous for the local population in Malaysia. Since then, numerous residential areas had been introduced and developed in many states with various types of houses. As a result, these developments had required high consumption of energy especially on electric power supplies.

2.2 Energy Sector in Malaysia

As one of the supplier of oil and natural gas in the world, Malaysia is constantly tries to meet the huge demands of domestic and international energy sector. It was a bit setback for the government when Malaysia's oil reserves have declined, from 771 billion barrels/day in 2000 to 703.92 billion barrels/day in 2007 [8]. As energy costs remain to increase from year to year whilst fossil fuels depleting, sustaining a stable development for Malaysia is getting very expensive and this can also affect the building industry in Malaysia. Thus, it is important for the government to establish energy security in the most economic manner towards ensuring sustainability in development.

Malaysia being blessed with a good mix of energy resources; from conventional energy resources (oil, natural gas, coal) to renewable energies such as solar energy, hydro power electricity, biomass, and wind. There are discussions towards implementing other energy resources from ocean energy, geothermal and nuclear in order to generate power supply. The potential of each energy are varies based on different factors and criterion. As prices of fossil fuels are not stable and remain on increasing, government is required to focus on the establishment of energy mix in Malaysia based on different resources apart from conventional fuels [9,10,3]. Table 1 and 2 shows the potential of each energy resources in Malaysia in order to generate electricity.

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