Green buildings in Malaysia towards greener environment: challenges for policy makers

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Abstract. The launch of the National Green Technology Policy (NGTP) in 2009 is a manifesto of the government’s seriousness in implementing “green” initiatives for the country. Specifically for buildings, the government promotes the application of renewable energy (RE) and energy efficiency (EE) and the application of green building index. With the introduction of Low Carbon Cities Framework, Green Pass, Green Neighbourhood, Green Building Index by various agencies and organisations in Malaysia, it is time to look back and see how all these tools could come together. This paper attempts to identify the challenges in harmonising the green initiatives for policy makers toward greener environment for sustainability.

1. Introduction
Green building initiatives in Malaysia is a concern that has received bigger attentions from government agencies, private organizations and the public at large for almost a decade now. With the launch of National Green Technology Policy (NGTP) in 2009, focus on green buildings has intensified with the promotion of application of renewable energy (RE) and energy efficiency (EE), as well as the green building index.

2. Policies and programmes
The launch of the National Green Technology Policy (NGTP) in 2009 is a manifesto of the government’s seriousness in implementing “green” initiatives for the country. These include among others intensification of green technology research and innovation towards commercialization, promotion and public awareness of green technology. Specifically for buildings, the government promotes the application of renewable energy (RE) and energy efficiency (EE) in buildings such as solar photovoltaic (PV), rainwater harvesting, phasing out of incandescent lights, and the application of green building index [1].

The National Policy on Climate Change (2009) through the Strategic Thrust for RE and EE champions the energy efficiency through promotion of green buildings in commercial / institutional, industrial and residential sector. This is achievable through application of low or zero energy concept in the design and construction of new buildings; retrofitting of efficient ventilation and cooling systems as well as lighting systems; energy conservation practice in buildings; retrofitting existing buildings to include EE features and generate “RE; and development of a green building index.

The government of Malaysia has taken several pro-active actions in promoting energy efficiency through demonstration buildings including the Energy Commission’s Diamond Building that could encourage private sector to also construct and design low energy buildings [2].
In summary, Table 1 shows the various building related policies and initiatives championed by the government together with various stakeholders.

| YEAR | POLICIES/ PROGRAMMES | AGENCY |
|------|-----------------------|--------|
| FUTURE | • Green PASS (Green Performance Assessment System In Construction)  
• In consultation phase with stakeholders  
• Developed by Construction Industry Development Board of Malaysia (CIDB)  
• Covers construction phase and operational phase of the building.  
  - Construction phase 5 elements - assessment of the construction site, building materials, energy, water and waste.  
  - Operational phase 5 elements - building indoor environmental quality (IEQ), energy and water | CIDB |
| 2012 | • PWD Green Rating Scheme (pH JKR Malaysia)  
• Rating tool for government buildings  
• 5 criteria - Energy efficiency, Indoor environmental quality, Sustainable site planning & management, Materials & resources, Water efficiency | PWD |
| 2011 | • Low Carbon Cities Framework & Assessment System  
• Covers four aspect of township – Environment, Infrastructure, Transportation & Building  
• Low Carbon Building: 5 criteria – Energy (EE+RE), indoor environment quality, site construction management, materials, water management  
• PILOT projects – Miri City Council, University of Malaya, Pulau Sahbesar in Kenyir, Port Dickson Municipal Council and Hang Tuah Jaya in Melaka  
• Green Township – Putrajaya & Cyberjaya  
• Green Neighbourhood Guidelines  
• Promoted by Ministry of Housing and Local Government (MHLG)  
• for local council enforcement use in evaluating plan submission  
• in line with LCCF with 4 criteria - Smart Location, Neighbourhood Pattern & Design, Green Infrastructure, Green Communities Network  
• Building Sector Energy Efficiency Project (BSEEP)  
• 5-year project - collaboration between United Nations Development Program (UNDP), Global Environmental Facility (GEF) and the government (Public Work Department (PWD) as the implementer) | MEGTW/MHLG/PWD |
| 2010 | • National Energy Efficiency Master Plan Study 2010  
• Replacing Incandescent to Compact Florescent Lamp (CFL)  
• Replacing Inefficient Refrigerators with 5-star Refrigerators,  
• Raising Air Conditioner Temperature to 25°C,  
• Replacing T8 to T5 lamp for Government Offices  
• Energy Auditing for Commercial Buildings  
• Economic Transformation Programme  
• Energy Performance Management System (EPMS) for government entities | MEGTW |
| 2009 | • National Green Technology Policy  
• National Energy Centre (PTM) restructuring to Malaysian Green Technology Corporation (MGTC).  
• Green Technology Financing Scheme (GTFS) (2010 -2015)  
  - Approved GT Value for Financing (RM): 1,118,895,495.00  
  - Balance of GT Value for Financing (RM): 2,381,104,505.00  
• Green Township in Putrajaya and Cyberjaya,  
• International Greentech and Eco Products Exhibition and conference Malaysia (IGEM)  
• National Policy on Climate Change  
• Green Building Index (GBI)  
• Developed by Malaysian Institute of Architects (PAM) and the Association of Consulting Engineers Malaysia (ACEM) supported by Malaysia Green Building Confederation (MGBC). Separates between Residential & Non-residential – the non-residential rating tools are customised by nature of whether they are commercial, industrial or institutional - including the Industrial Rating Tool  
• 6 criteria measuring energy efficiency (EE) – indoor environment quality, sustainable site and management, materials and resources, water efficiency, and innovation | MEGTW/MNRE/ private initiative |
3. Green Building Ratings
A UNEP expert, Dr Arab Hoballah has said in one of many climate change related venues in 2009, “…almost no country in the world can hope to achieve carbon dioxide-reduction targets without including the building sector into their plan of action.”[1]. Improving energy efficiency in buildings is one of the most cost-effective measures for reducing carbon dioxide (CO2) emission.

To do just that, one must go back to basic, defining what green building is. According to U.S. Environmental Protection Agency, green building or sustainable building (sustainable building) refers to a structure and using process that is environmentally responsible and resource-efficient throughout a building’s life-cycle: from design, construction, operation, maintenance, renovation, and demolition [3]. To determine whether a building meets all the criteria of a green building, a rating system is applied. Another question arises, which rating system should one adopt? Are they all the same?

Generally, there are two approaches to measure the “greenness” of a building. First approach is by measuring the level of energy consumption and usage per square metre of the building. A building is then labelled as Low, Zero or Green Energy Buildings. The measurement uses the balance or equation between reducing energy demand for a building with its optimisation of renewable energy resources that could be exported into external grids. [4]. On the other hand, Low and Zero Carbon term uses carbon emission calculation for a building, which largely relates back to energy consumption.

Referring to the previous table, one will notice the issue, “Which one should be used for building in Malaysia?” The regulator is then posed with additional question, “to fully regulate or allow for self-regulation?

4. Conclusion and recommendations
With the aforementioned questions on hand, the policy makers in Malaysia should try harmonise the various rating or measurement systems for the building sector. Adopting a review by Lombard, et. al. (2009) on building energy labelling, rating for green building in Malaysia must have (1) definition of green building index, (2) development of green building calculation tool, (3) setting a threshold value for the performance index, (4) definition of the comparison scenario, (5) definition of the scale for green building rating, (6) identification of potential green building measures and (7) gathering information in the certification process.

Next consideration is to fully regulate the building sector or leave some space for self-regulation. This action could be implemented in stages based on the rate of awareness and acceptance by the stakeholders. Malaysia policy makers should (1) review all existing policies – to better fit to country’s needs & position, (2) assess policies implementation , i.e. programmes, incentives etc – must be based on problem-solving, potential, & dedicated resources, (3) focus on proven programmes –to have better yields, and (4) focus on major improvements in high potential and critical areas. Efficiency, effectiveness, and sustainability must be evaluated at the systemic and programmatic level. While one
particular program form may seem to be effective, there is potential for this program to have minimal or even negative consequences on a system’s design intent [6].

It is hoped that as Malaysia heads towards a more comprehensive implementation of green development in the country, the building sector could champion the cause, by maturing fast enough. However, the green initiative requires strong support from all the stakeholders. The awareness campaigns need to be intensified.

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