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## **Theme Paper**

# **Sustainable Construction Policy and Market In Malaysia**



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## **EXECUTIVE SUMMARY**

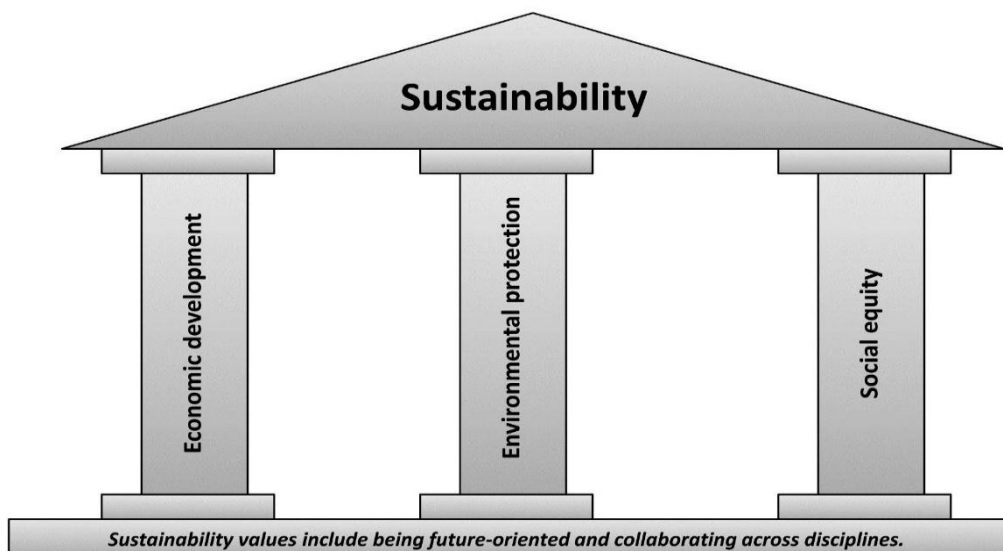
Sustainable construction addresses two major global challenges: the significant environmental impact of the construction industry and balanced against the industry's economic and social benefits. To ensure the achievability of these challenges in a successful manner, various types of sustainable-related initiatives, techniques and rating tools have been developed for the construction industry worldwide. This paper aims to identify sustainability construction policy and market, available in Malaysia by looking thoroughly into current issues that are being highlighted in the industry practice as well as current efforts made according to the surrounding conditions and future development related to sustainable construction policy and market in Malaysia. Thus, numerous sustainability construction-related initiatives and policies have been made available in the Malaysian construction industry market over the years, from the Industrialised Building System (IBS) Roadmap 2003-2010 to the most recent environmental sustainability tool known as Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST), which prioritises carbon emission reduction. The Construction Industry Transformation Programme (CITP) has also been developed to prepare Malaysia's construction industry towards a robust competition at the global level where an extensive emphasis being placed on environmental sustainability as one of its key thrusts.

## **INTRODUCTION**

Sustainability focuses on living within the limitations, equitable distribution of resources and opportunities as well as understanding the interconnections between economy, society and the environment that includes areas like energy, transportation, water use, recycling, and natural resource life cycles. To be sustainable as an individual, an organization ought to manage resources in a responsible manner, with minimal impact on the natural surroundings and climate. A sustainable way of living can be assessed in many forms from controlling living conditions and sustainable cities to green building and sustainable technologies that able minimize the consumption of resources. Sustainable construction is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It comprises of 2 key concepts, namely the concept of needs, the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. Sustainable construction, which is also known as green construction or sustainable building, refers to a structure, the construction process and occupancy processes that are environmentally responsible and resource efficient throughout a building's life-cycle from location to design, construction, operation, maintenance, renovation, and demolition. Sustainable construction should also enhance living; working and leisure environments for

individuals and communities; consume minimum energy over its life cycle; generate minimum waste over its life cycle; and integrate with the natural environment as well as utilizing renewable resources where possible.

Figure 1 The Key Pillars for Sustainability Development



Source: Turner, 2014

Table 1 Key Attributes of Sustainability

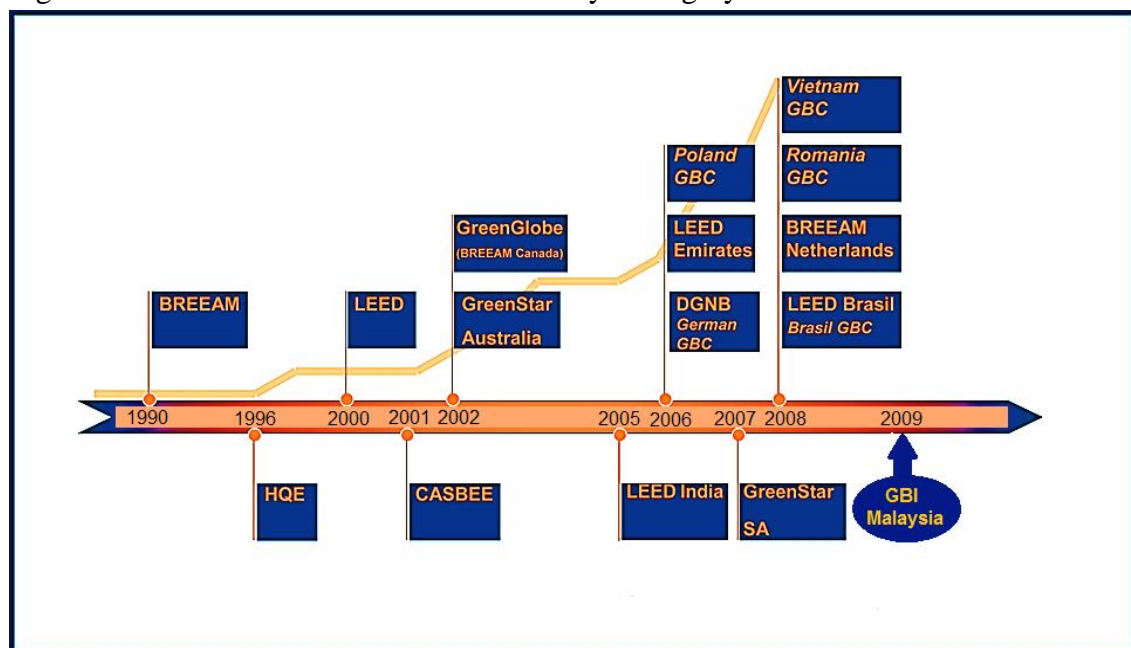
<b>Environment Sustainability</b>	<b>Economic Sustainability</b>	<b>Social Sustainability</b>
Protect the diversity of life and earth	Create new markets and business opportunities	Provide basic social need i.e. education and cultural activities on long-term basis (strategically)
Conservation of life-supports systems	Cost reduction via energy efficiency and minimal resource input in production	Enhance quality of life
Sustainable usage of renewable resources	Extensive provision of added value	Integrate disabled community into society
Protect cultural and historical environments		Protects the rights of future generation

The 3 key pillars for sustainability development, namely economic development, environmental protection and social equity as shown in Figure 1. The modern concept underlying economic sustainability seeks to maximize the flow of income that could

be generated while at least maintaining the stock of assets (or capital) which yield this income. The interpretation of environmental sustainability focuses on the overall viability and health of living systems, which being defined in terms of a comprehensive, multi-scale, dynamic, hierarchical measure of resilience, vigor and organization. Social sustainability reflects improvements related to individual well-being or the overall social welfare, which resulted from an increase in social capital that involve people such as leadership, public relations and human resources. Table 1 summarizes the findings on key attributes required within these 3 key pillars for sustainability development.

It was identified that there is an increasing focus on providing a ‘business case’ for sustainable development as a result of the emergence of planning policies and EU directives i.e. Energy Performance of Buildings Directive. This type of business case is typically associated with internal corporate drivers such as the demand for improved risk management and better governance structures to deal with environmental risk in the real estate sector. The characteristics and attributes of sustainability assessment tools available for built environment professionals, which enable them to provide relevant support advice to their respective clients are different based on the needs of the host country. Typically, a sustainability rating tool/system is developed based on the individual characteristics of each country, such as the climate and type of building stock, necessitate an individual sustainability rating tool for that country. Thus, there are approximately 600 assessment tools that measured or evaluated the social, environmental, and economic dimensions of sustainability available around the world currently as shown in Figure 2.

Figure 2 The Evolution of Sustainability Rating System



The Malaysian construction industry has taken a major step towards embracing sustainable and green development particularly in building projects by propelling its own 'Green Building Index' (GBI), which was established jointly by the Malaysian Institute of Architects and Association of Consulting Engineers Malaysia (ACEM) in 2009. The GBI rating tool focuses on expanding the productivity of asset utilization in terms of energy, water, and materials while lessening building effect on human wellbeing. Thus, the six distinctive criteria being evaluated under the GBI rating tool are energy efficiency, indoor environmental quality, reasonable site planning, management, material & resources, water efficiency and innovation.

## **MAIN ISSUES WITH CONSTRUCTION INDUSTRY AND MARKET**

The development of the construction industry in Malaysia started in 1970 when the government-of-the-day introduced a 20-year “New Economic Policy (NEP)” plan, which include extensive acceleration on infrastructure projects through public sector expenditure. The growth of the construction industry in Malaysia has been further enhanced through the introduction of “Vision 2020” in 1991 that resulted in extensive procurement of several large-scale infrastructure and building projects en route to achieving all the goals envisaged in the vision. Consequently, the rapid expansion on the construction activities has led towards excessive shortages in terms of building materials and labours, which also require appropriate machinery and equipment to be imported from outside Malaysia.

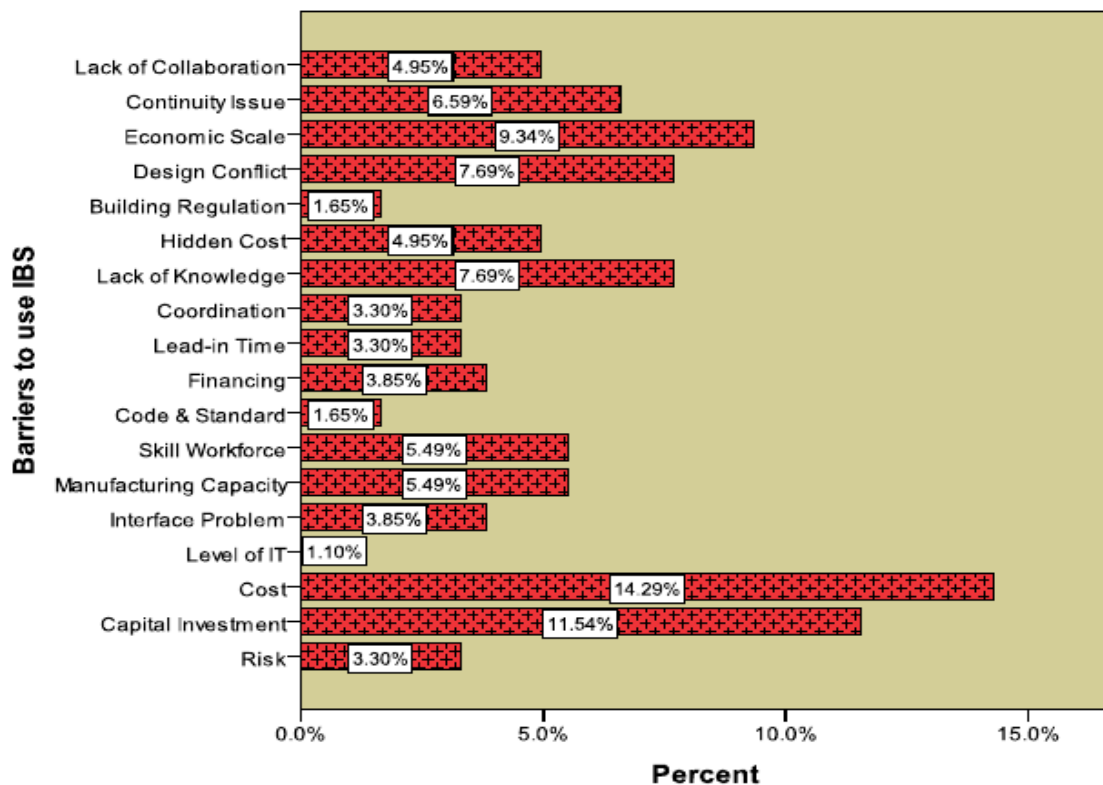
Issues related to sustainable development and green construction have surfaced as early as in the year 2000 where the Malaysian government started to realize the importance of sustainable construction that able to utilize resources to meet the needs is the present without compromising the future generation’s ability to meet their own needs. Hence sustainable development and green construction have been included as among the top issues addressed in the 8<sup>th</sup> Malaysia Plan (2001-2005). The plan also states that concerted efforts are needed in the construction planning processes to improve energy efficiency as well as waste and environmental management. The Malaysian government continues to address the issue on sustainable development and green construction in the 10<sup>th</sup> Malaysia Plan (2011–2015) to ensure that the future generation of Malaysia is not compromised as the country remains to develop promptly in the construction industry. In the 10<sup>th</sup> Malaysia Plan (2011–2015), the construction sector has recorded an annual average growth rate of 11.1%, which is even higher than the national GDP of 6.3%.

However, the paradigm shift to adopt new sustainable development and green construction in Malaysia is still at a slower pace compared to other advanced countries due to several reasons. Amongst them, include issues such as financial constraints of private practitioners as well as their ignorance towards the importance of sustainable

construction and insufficient level of consciousness from government implementing agencies.

Figure 3 outlines the example of barriers that have hindered a full implementation of sustainable development and green construction through Industrialised Building System (IBS) in the construction industry in Malaysia. Even though IBS offers a significant guarantee in terms of quality and productivity from efficient factory-made products, cost has been identified as the key barrier particularly for Malaysian contractors, which has restricted them from a full implementation of the IBS in their building projects. Relatively high capital overhead and transportation costs required from IBS implementation would virtually eliminate their potential gain achieved through industrialisation. Heavy capital cost involves in IBS would lead towards insufficiency in terms capacity for contractors to secure projects. Also, lack of experience, lack of technical knowledge and lack of skilled labour are among other barriers that have hindered a successful IBS adoption by the Malaysian contractors.

Figure 3 Barriers to use Industrialised Building System (IBS) by Malaysian Contractor



Source: Kamar et.al (2012)

## **Financial Constraints of Key Practitioners**

Implementing sustainable practices need significant amount of time and cost investment. Subsequently these requirements would significantly decrease the interests of contractors and developers in doing so. There is a common perception that the cost required for sustainable and green alternatives are always higher than the conventional construction method, which mainly due to the cost of a building is often measured in terms of the construction cost instead of the life cycle cost. It has been stated that the cost efficient would ultimately benefit the owner and not the developer. The financial capability of a developer depends on its size; large-sized developers have greater financial capacity to pursue for sustainable practices. Thus, large-sized companies are more aware of the sustainable issues and requirements through proper execution of construction process particularly those activities related to planning, design and allocation of budget.

In Malaysia, contractors and developers are mainly made up of medium and small-sized companies, which are mostly financially constrained even though they are fully aware of issues pertaining sustainability. It is their preference to build to just meet the regulatory criteria and to gain optimum profit rather than putting effort in giving more consideration to environmental and social aspects. For this reason, unless there is an increase of market demand for green buildings; most of the construction stakeholders will be reluctant to transform the industry towards sustainability.

## **Ignorance of Private Practitioners on the Importance of Sustainable Construction**

The deficiency of knowledge and awareness among practitioners in the industry practice could be an obstacle in achieving sustainable construction, as it would lead towards a potential failure in reaching a consensus among experienced developers and possibly clients. Thus, it is important that all general stakeholders in the construction industry such as developers, contractors, consultants and clients are fully aware about the importance of sustainable construction, which would cultivate interest between and further serves as a motivation to pursue appropriate knowledge and awareness on sustainability development and green construction as a result. Having due diligence helps in their decision making which benefits every party while contributing the least damage to the environment.

In the Malaysia context, the request for sustainability is recognized as “always there” particularly through various government programmes and initiatives but the implementation is very poor because of insufficient knowledge and awareness among client, consultants and contractors. Even though it may be a major hindrance towards a comprehensive implementation, having a substantial knowledge and awareness on this matter also does not necessarily guarantee a successful delivery of sustainable



development and green construction in the construction industry in Malaysia at the desired level. The level of knowledge and awareness on the sustainability concept among the developers and contractors is still moderate where there is still a huge knowledge and awareness gaps between well-established big companies with the small-medium ones.

### **Insufficient Level of Consciousness from Government Implementing Agencies**

The intervention from relevant government implementing agencies is necessary to ensure a comprehensive adoption of sustainable and green construction practices in the construction industry. Majority of the stakeholders in the construction industry around the world believe that sustainable development and green construction can be promoted only if the government and its relevant implementing agencies are committed of doing so. This can be achieved by introducing appropriate standards related to sustainability and green construction practices, which then should be enforced as compulsory for any project development in Malaysia. If the government enforces standards for the environment and green buildings in the construction industry then its implementation is likely to progress quickly to overcome a typical behaviour of practitioners, which pay little attention or even ignore anything that is not a mandatory requirement for implementation. The government could even offer incentives and rewards for construction industries and consumers for constructing sustainable energy and cost efficient green buildings.

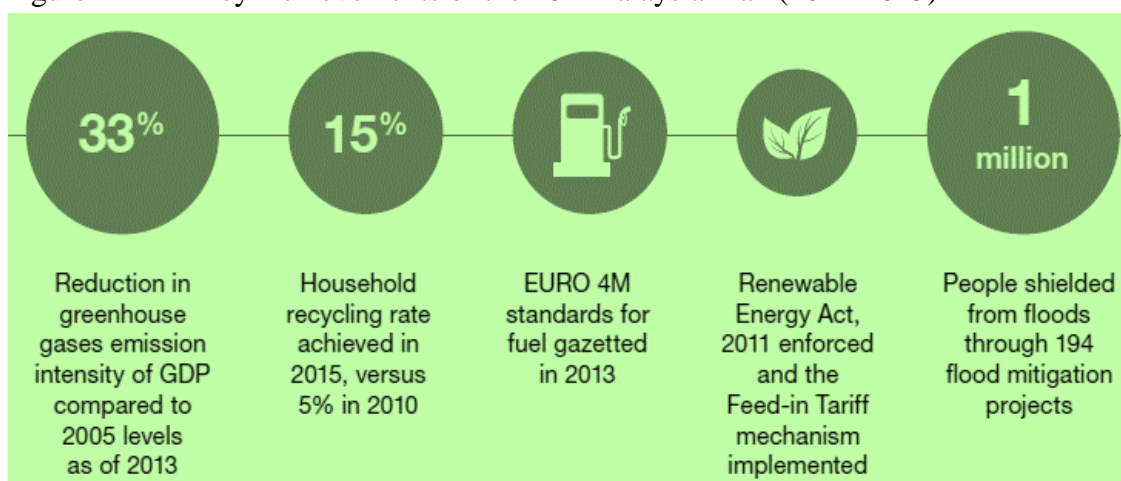
In Malaysia, it is a common for contractors to comply exactly with the statement of needs and project specification as issued by clients through explicit detail briefing. This has somehow restricted contractors from the flexibility to innovate through sustainable and green construction in the real project practice. Even though the Malaysian government have introduced various programmes and initiatives related to sustainability in construction, the insufficient level of consciousness of some government implementing agencies has become an issue in the construction industry in Malaysia. It has surfaced as a result from lack of understanding on the significance of sustainable construction due to inadequate training on the related matter. Subsequently there is minimal emphasis have been imposed by some government implementing agencies towards the implementation of a comprehensive sustainable construction practice in Malaysia.

## EFFORTS MADE ACCORDING TO THE SURROUNDING CONDITIONS OF CONSTRUCTION INDUSTRY

Malaysia has set a target to become an advanced economy by 2020. However, if restricted available natural resources have not been used efficiently, it will result in irretrievable loss and hence putting the nation's development at risk particularly on socio-economic, which is vital in raising the quality of lives of the Malaysians. This long-term national target can be achieved through a resilient, low-carbon, resource-efficient, and socially-inclusive manner. In the 10<sup>th</sup> Malaysia Plan (2011-2015), the Malaysian government prioritised the importance of environmental sustainability as part of a comprehensive socio-economic development plan where relevant measures that addressed all the issues related to climate change, environmental degradation and sustainable utilisation of Malaysia's natural endowment have been highlighted as national agenda in the plan.

In 2009, Malaysia set a voluntary target of reducing the greenhouse gases (GHGs) emission intensity of its Gross Domestic Product (GDP) by up to 40% by 2020. Under the 10<sup>th</sup> Malaysia Plan (2011-2015), Malaysia has managed to achieve 33% reduction in terms of greenhouse gas emission that is just slightly off the target set for 2020. In adapting to climate change, it is understood that almost a million people have been shielded from the detrimental impact of floods via an extensive implementation of 194 flood mitigation projects throughout the five-year national plan. Figure 4 summarizes the key achievements of the 10<sup>th</sup> Malaysia Plan 2011-2015 in general.

Figure 4 Key Achievements of the 10<sup>th</sup> Malaysia Plan (2011-2015)



Following are the 6 strategic thrusts being emphasised in the 11<sup>th</sup> Malaysia Plan (2016-2020):

- i. Enhancing inclusiveness towards an equitable society;
- ii. Improving wellbeing for all;
- iii. Accelerating human capital development for an advanced nation;
- iv. Pursuing green growth for sustainability and resilience;
- v. Strengthening infrastructure to support economic expansion; and
- vi. Re-engineering economic growth for greater prosperity.

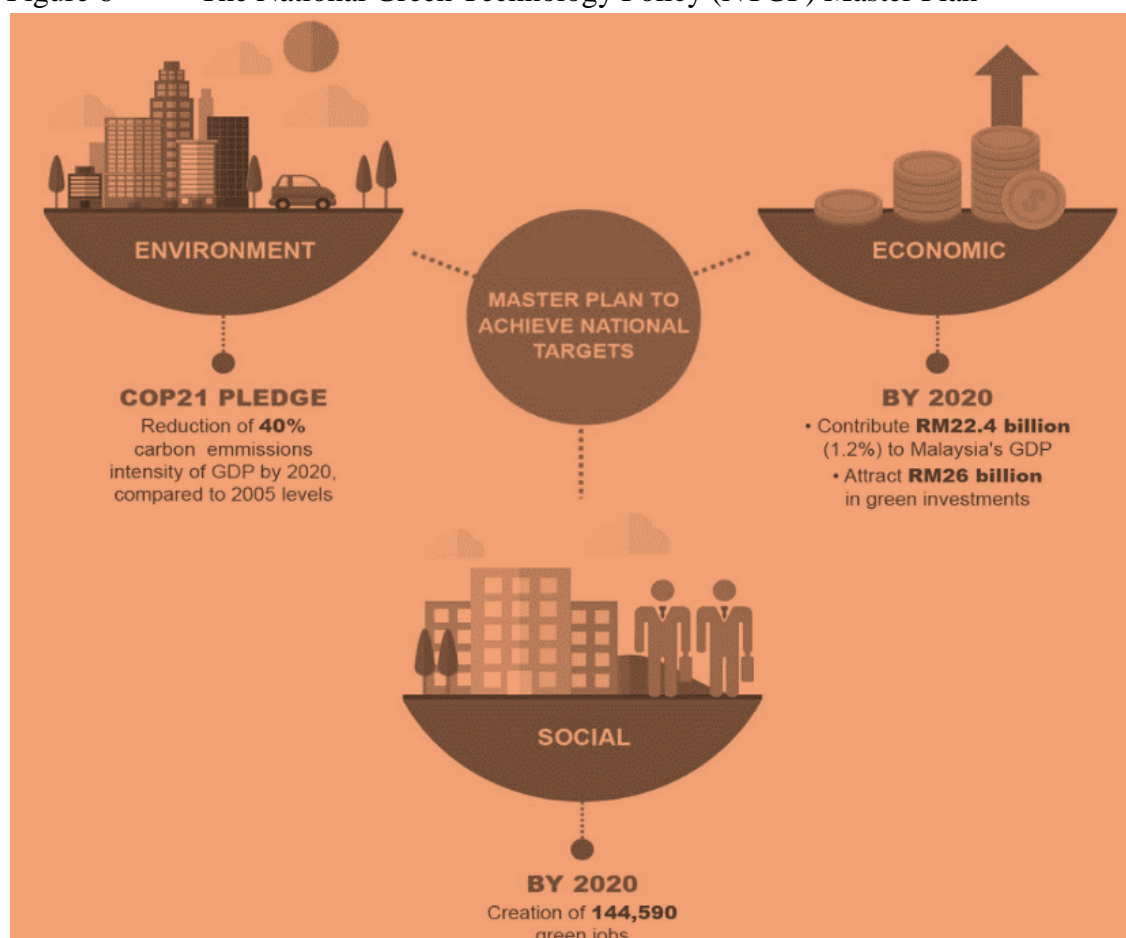
As one of the key strategic thrusts outlined in the 11<sup>th</sup> Malaysia Plan (2016-2020), green growth is a fundamental shift that addresses how Malaysia sees the role of natural resources and the environment in its socio-economic development, protecting both development gains and biodiversity concurrently. In order to pursue with green growth, there is a need to strengthen the enabling environment from the perspective of policy and regulatory framework, human capital, green technology investment and also financial instruments. Figure 5 portrays the key focus areas under the green growth for sustainability and resilience thrusts in the 11th Malaysia Plan (2016-2020), namely strengthening both environment for green growth and resilience against climate change/natural disaster as well as adopting sustainable consumption concept and conserving natural resources for future generations.

Figure 5 Key Focus Areas under Green Growth Thrust in the 11<sup>th</sup> Malaysia Plan 2016-2020



The National Green Technology Policy (NGTP) has been launched as one of the key initiatives of the Malaysian government to address green technology issues in order to support the “green growth for sustainability and resilience” thrust by thoroughly looking into the four main areas of concern, namely energy, environment, economy and social that are more or less identical to the three key pillars emphasized in sustainability. A new Ministry known as the Ministry of Energy, Green Technology and Water (KeTTHA) has been established in 2009 with the intention to promote high impact research and development (R&D) related to green technologies in Malaysia. Figure 6 summarises the green technology targets set in the NGTP, which is to reduce 40% of the carbon emission intensity by 2020. In regards to social matters, the NGTP has targeted the creation of approximately 150,000 green-related jobs to the Malaysian by the year 2020. As for the economic, the master plan structured for the NGTP has targeted to contribute at least 1.2% of Malaysia’s GDP from an estimated RM26 billion of green investments by 2020. This prediction is being made mainly based on the ability of the country to attract RM12 billion of investments in the photovoltaic solar industry from several top companies around the world in 2010 i.e. First Solar.

Figure 6 The National Green Technology Policy (NTGP) Master Plan



The construction industry in Malaysia is expected to undergo a full transformation from conventional into a modern, highly productive and sustainable industry under the Construction Industry Transformation Programme (CITP) blueprint. The CITP blueprint, which forms part of the 11th Malaysia Plan (2016–2020), comprises of 18 initiatives from four key strategic thrusts: quality, safety and professionalism; environment sustainability; productivity; and internalisation. Besides ensuring the Malaysian construction industry as a low carbon, sustainable building and infrastructure model country especially to ASEAN counterparts through the implementation of sustainable construction systems and practices via CIDB’s centre of excellence, the CITP blueprint also considers initiatives that able to inspire faster adoption of the IBS construction technique via the establishment of appropriate economic mechanisms and modern practices.

### **Construction Industry Transformation Programme (CITP) 2016 - 2020**

Despite many initiatives and programmes being implemented over the years, real and substantial issues persist in the construction industry. In line to the national agenda set in the 11<sup>th</sup> Malaysia Plan (2016-2020), which acts as the core of our nation’s aspirations towards a robust and dynamic economy, the Construction Industry Development Board (CIDB) Malaysia has launched the Construction Industry Transformation Programme (CITP) (2016–2020) to contribute to and align with these national transformation strategies, to ensure continuity and consistency with the national agenda. The implementation of the CITP is expected to address all the 6 strategic thrusts outlined in the 11<sup>th</sup> Malaysia Plan (2016-2020). The CITP has been developed mainly based on persistent issues and problems that continue to take place in the construction industry practice in Malaysia despite the implementation of relevant initiatives and programmes over the years such as limited emphasis on quality in workmanship and quality assessments resilience of construction works to natural disasters, high carbon emissions and energy use coupled with high contribution of construction waste to landfills. Thus, the CITP comprises of 4 key strategic thrusts;

- CITP Strategic Thrust 1: Quality, safety & professionalism;
- CITP Strategic Thrust 2: Environmental sustainability;
- CITP Strategic Thrust 3: Productivity; and
- CITP Strategic Thrust 4: Internationalisation.

Figure 7 indicates all the outcomes expected from each of the CITP strategic thrusts by year 2020.

Figure 7 Expected Outcomes from the Four Strategic Thrusts of the CITP

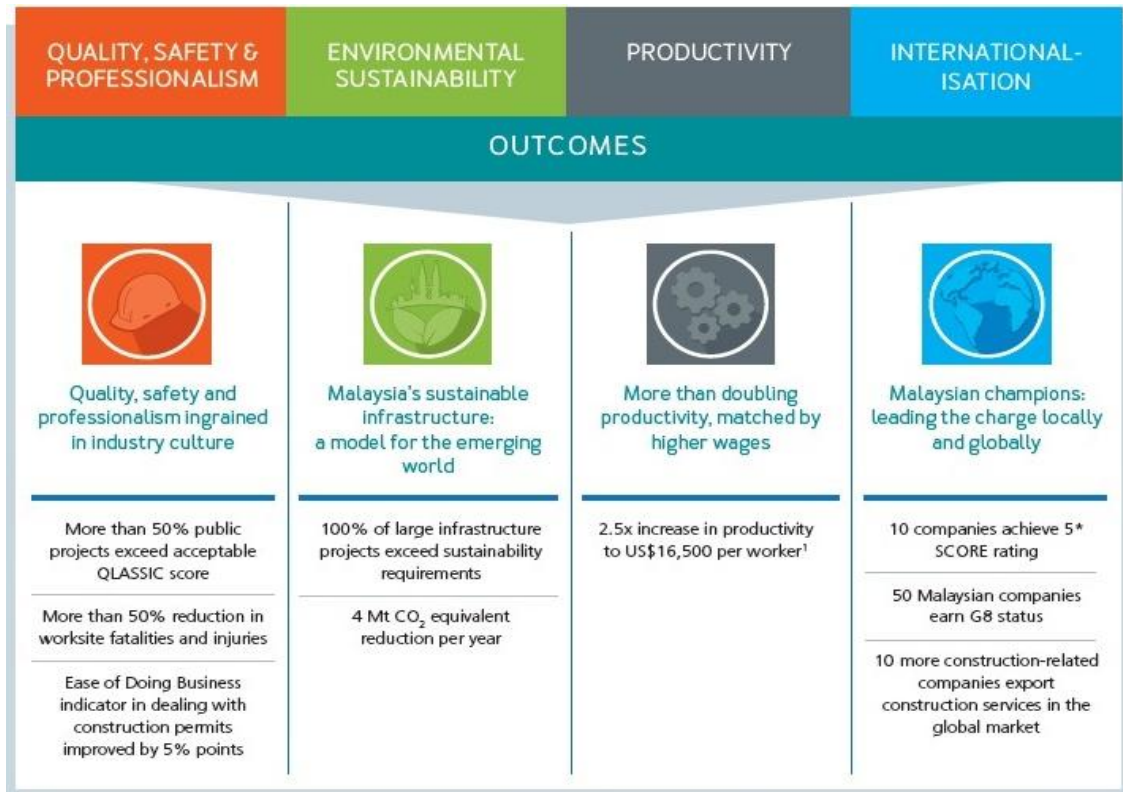
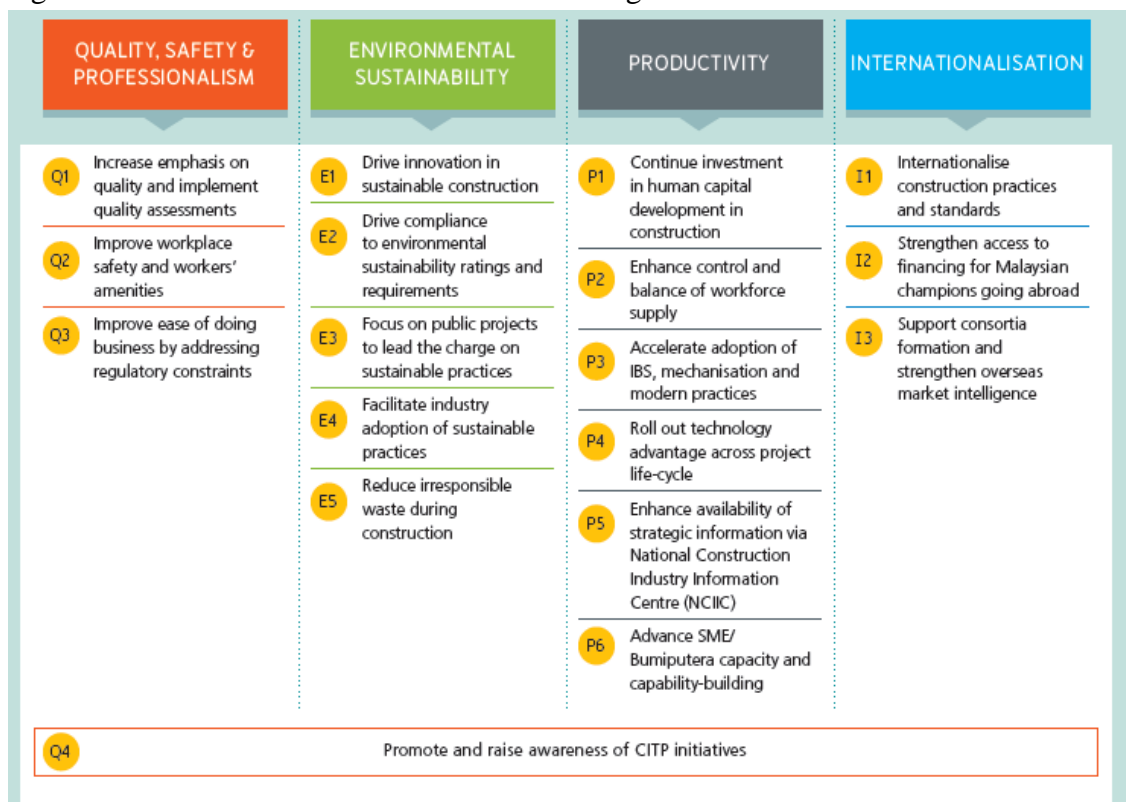


Figure 8 portrays all the potential initiatives that should be addressed by each of the four strategic thrusts in the CITP by 2020. The productivity thrust has the highest number of initiatives that must be achieved within the next 5 years including full adoption of the Industrialised Building System (IBS). In the Malaysian context, IBS is described as a construction technique in which components are manufactured in a controlled environment (on or off site), transported, positioned and assembled into a structure with minimal additional site work. Among the key national iconic landmarks that have been procured using the IBS technique include KL Tower (steel beams and columns for tower head), the Kuala Lumpur International Airport (steel roof structure) and the PETRONAS Twin Towers (steel beams and steel decking for the floor system). The IBS technique offers minimal wastage; fewer site materials; a cleaner and neater environment; controlled quality; and lower total construction costs. The CIDB, which is responsible to courage the standardisation and improvement of construction techniques and materials in Malaysia, has been given the priority to be the first champion of a coordinated national level programme to promote the IBS implementation policy in the construction industry in Malaysia through IBS Roadmap 2003-2010 and IBS Roadmap 2011-2015 master plans.

Figure 8 CITP Initiatives from the 4 Strategic Thrusts



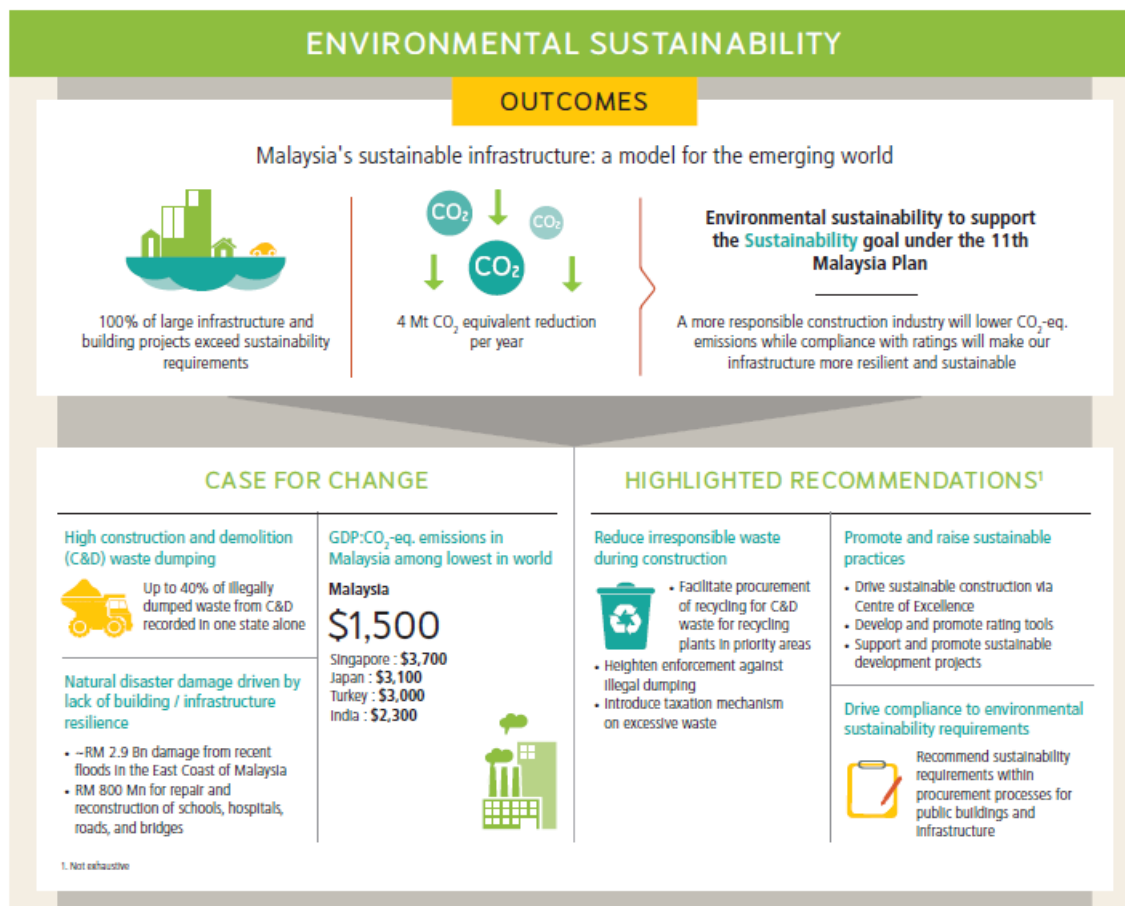
The IBS Roadmap 2003-2010 master plan is designed to prepare private contractors and developers towards a major change in their procurement process where all projects development is required to achieve minimal IBS buildability score before any development approval is being sanctioned. The IBS Roadmap 2003-2010 master plan has been developed based on the 5-M strategy that focuses on manpower, monetary and marketing as well as materials-components-machines and management-processes-methods with the target of having an industrialised construction industry and achieving an open building concept through full implementation of the IBS by the year 2010. The policy objectives set in the IBS Roadmap 2011-2015 master plans meanwhile are more focused on imposing high level of intended outcomes in four key areas, namely quality efficiency, competency and sustainability through comprehensive IBS implementation in construction projects in Malaysia. Among the main goals of the IBS roadmap 2011-2015 are to sustain the existing momentum of 70% IBS content for public sector projects as well as to increase 50% of IBS content for private sector projects in the construction industry in Malaysia by 2015.

### CITP Strategic Thrust 2: Environmental Sustainability

CITP aims for Malaysia's environmentally sustainable construction to be a model for the emerging world, and especially within the ASEAN countries. Among the key outcomes embedded under this thrust include 100% of large infrastructure projects to

exceed sustainability requirements with a 4 Mt CO<sub>2</sub>-equivalent reduction per year. Figure 9 addresses the outcomes, expected changes and recommendations that have been set as obligations for the environmental sustainability thrust in the CITP.

Figure 9 Expected Outcomes, Changes and Recommendations of the Environmental Sustainability Thrust



There are 3 specific issues that should be addressed under environmental sustainability, namely lack of sustainability-rated construction; buildings and infrastructure are not always resilient to natural calamities; high carbon emissions and energy usage of buildings; and high volume of construction and demolition waste dumping. Thus, following are the 5 core objectives that able to comply with all the environmental sustainability-issues highlighted:

Initiative E1: Drive innovation in sustainable construction

Initiative E2: Drive compliance to environmental sustainability ratings and requirements

Initiative E3: Focus on public projects to lead the charge on sustainable practices

Initiative E4: Facilitate industry adoption of sustainable practices

Initiative E5: Reduce irresponsible waste during construction



Initiative E1 focuses improving the three sustainability pillars on long-term basis including the preservation of required resources as well as protecting natural function and the ecosystem. Initiative E2 aims to ensure the availability of sustainability rating tool that suits with minimum sustainability standards in the Malaysian context prior to driving its full adoption into large-scale public projects. Initiative 3 mainly look into improving sustainability standards for construction particularly on procurement specifications, resource allocation, and resource performance. Initiative 4 meanwhile addresses all the important mechanisms and incentives that able to expedite the adoption of environmentally sustainable development by the private sector. Enhancing waste efficiency and waste management practices in the construction industry practice in Malaysia are the primary objectives of Initiative 5 embedded under environmental sustainability thrust in the CITP blueprint.

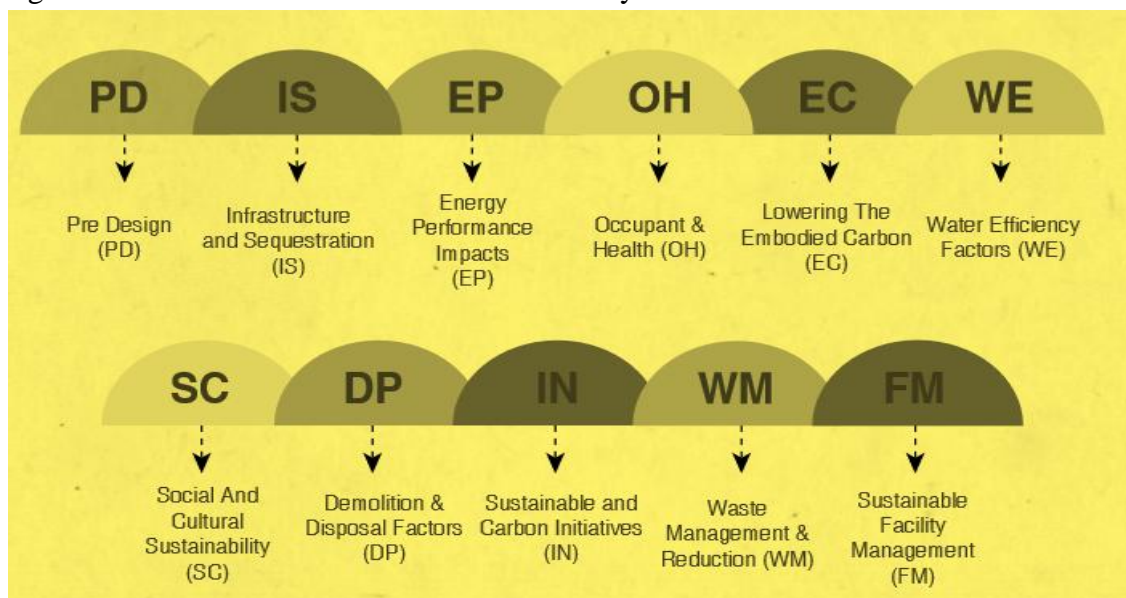
Initiatives E1 and E2 are expected to have a significant contribution towards achieving the fourth strategic thrust of 11<sup>th</sup> Malaysia Plan: ‘Pursuing green growth for sustainability and resilience’. The Centre of Excellence (CoE) for Sustainable Construction has been initiated as the “home” for driving sustainability in construction through a number of host of initiatives and functions. Apart from developing, promoting, and implementing sustainable construction systems and practices in Malaysia and beyond. Besides that, the CoE is responsible to enhance awareness to create shared accountability by setting up a platform for knowledge sharing and collaboration.

### **Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST)**

In terms of environmental responsibility, buildings are one of the key sources to reduce carbon emissions around the world due to the fact that residential and commercial buildings are one of the largest consumers of energy and water as well as producers of emissions and waste. In Malaysia, residential and commercial buildings are estimated to consume 15% of the total energy and have been identified as key contributor towards the greenhouse gas emissions. Moreover, less than 2% of buildings in this country has been rated with a sustainability tool and many local construction businesses have yet to adopt more environmentally friendly practices of the kind that are already common in neighbouring countries like Singapore. The Ministry of Works through the Public Works Department (JKR) and CIDB introduced the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST) as a sustainability rating tool, which aims to quantify and reduce carbon emissions in the construction sector particularly on building projects. MyCREST would act as guidelines for industry players to incorporate greater environmentally sustainable practices in their projects

One of the key objectives of MyCREST is to ensure that the target set in the CITP for the construction industry to achieve a reduction of 4 mega tonnes (MT) of CO<sub>2</sub> (carbon dioxide) emissions per year can be achieved in line with the Malaysian government's commitment to reduce greenhouse emissions by 40% by 2020. As a result, all public projects that are worth RM50 million and above must be assessed via MyCREST as one of the initiatives by the Malaysian government in a bid to reduce carbon emissions in the construction industry. MyCREST considers 11 assessment criteria that range from the pre-design phase up to the stage of sustainable facility management where points are usually being awarded based on carbon emission reduction efforts by the projects assessed. Figure 10 portrays all the 11 criteria set for the assessment of MyCREST.

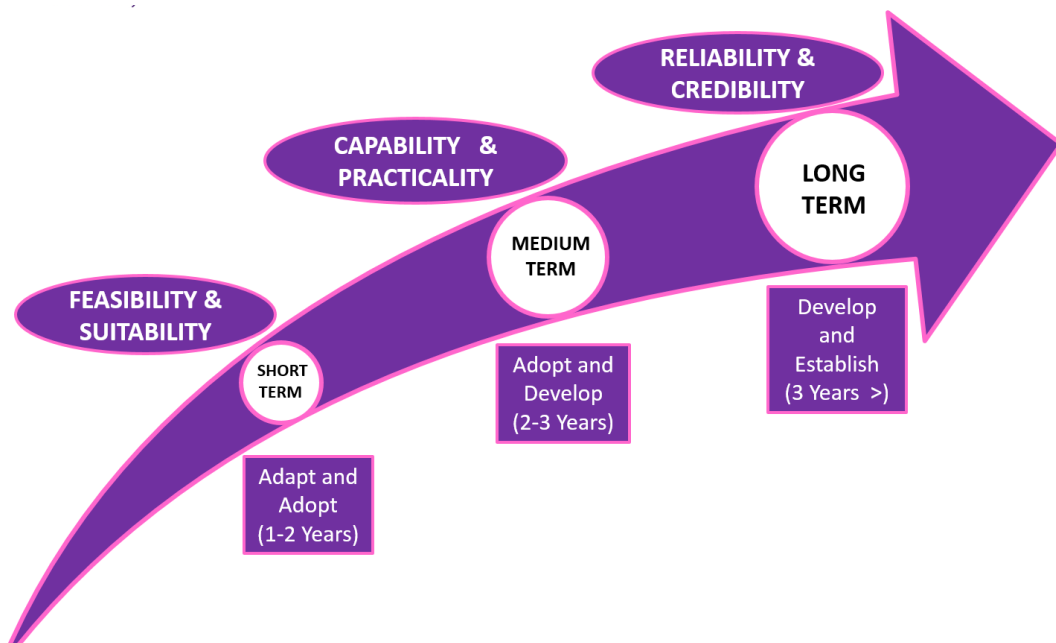
Figure 10 The 11 Assessment Criteria of MyCREST



## FUTURE DEVELOPMENT FOR CONSTRUCTION SUSTAINABLE POLICY AND MARKET

Currently in Malaysia, there is no sustainable infrastructure rating tool in Malaysia to assess and preclude usage of materials and practices that are not aligned with sustainability, unlike buildings where there are a few in use such as the Green Building Index (GBI) and most recently, MyCREST. Only less than 2% of buildings and infrastructure are rated for environmental sustainability. This is driven partly by the lack of overarching policies and regulations that require these ratings or assessments, and is exacerbated further by the perception that ‘green’ is more expensive. Wherever there are supporting green and sustainability-related policies, relatively inability to enforce contributes to a low take-up of sustainable practices.

Figure 11 The Development of Sustainable Infrastructure Rating Tool Proposed Planning



Development of a new sustainability rating tool is vital for Malaysia with the elements of institutionalising and customisation as the most important consideration to support the Malaysian CITP (2016-2020) under the strategic trust of environmental sustainability. It is expected that with the development of a new rating tool for Malaysia, it is evident that the tool developers will incorporate lessons learned from within our own projects and will extend the new tool to account for technical clarifications looking at the entire project life-cycle, broader sustainability scope and in many cases, the practicality and simplicity aspects across new infrastructure types and life cycle phases with a high degree of cost effectiveness.

The CIDB through its CoE is currently working collaboratively with Universiti Sains Malaysia as its local partner to develop a sustainable infrastructure rating tool for the construction industry. Figure 11 underlines the long-term planning between the CoE and USM towards the development and implementation of the sustainable infrastructure rating tool intended for the construction industry in Malaysia. The first stage of the rating tool development involves an “adapt and adopt” approach where the feasibility and suitability of existing infrastructure sustainability rating tools worldwide are going to be justified in order to choose the most appropriate one, which is compatible to the Malaysian construction industry context.

A desktop study has already been undertaken by both the CoE and USM to assess the feasibility and suitability of selected infrastructure sustainability rating tools available for construction industry worldwide. As a result, CEEQUAL UK and ENVISION US have been identified as the two most feasible and suitable. A thorough feasibility and

suitability assessment on both rating tools is currently underway through an extensive pilot project evaluation on selected highway projects in Malaysia. Once the most feasible and suitable infrastructure sustainability rating tool has been identified, the second stage of the Malaysian sustainable infrastructure rating tool will involve the assessment on the capability and practicality of the selected rating tool towards the construction industry practice in Malaysia. This is the stage where various types of infrastructure projects in Malaysia such as bridges and airports are going to be tested to determine the reliability and credibility of the proposed model prior to establishing a new sustainable infrastructure rating tool for construction industry in Malaysia by 2020.

## **CONCLUSION**

The government has initiated various ways to promote substantial implementation of green and sustainable construction in the industry practice in Malaysia through robust national plans over the years. The government has even shifted its main emphasis from the conventional and costly ‘grow first, clean-up later’ approach onto a greener course of “Green Growth” in the most recent Malaysia plan to ensure that most of the projects procured are environmentally sustainable. In line with the national agenda, several sustainable construction-related initiatives have been made available “by the industry and for the industry” such as the GBI for green buildings. The government has also strategized the ambition to transform the Malaysian construction industry into using modern and sustainable method of construction through the Construction Industry Master Plan (CIMP) 2006 – 2015. CIDB has been addressing issues on sustainable and green construction in line with the CIMP’s agenda through its IBS Roadmap.

The construction industry in Malaysia is expected to undergo a full transformation from conventional into a modern, highly productive and sustainable industry by 2020 under the Construction Industry Transformation Programme (CITP) blueprint. The CITP blueprint, which forms part of the 11th Malaysia Plan (2016–2020), comprises of 18 initiatives from four key strategic thrusts: quality, safety and professionalism; environment sustainability; productivity; and internalisation. Besides ensuring the Malaysian construction industry as a low carbon, sustainable building and infrastructure model country especially to ASEAN counterparts through the implementation of sustainable construction systems and practices via CIDB’s centre of excellence, the CITP blueprint also consider initiatives that able to inspire faster adoption of the IBS construction technique via the establishment of appropriate economic mechanisms and modern practices.

To ensure a successful delivery of the more recent transformation plan like the CITP and sustainability assessment tool such as MyCREST, a robust approach should be initiated to enhance understanding and awareness of the industry practitioners in regards to the importance of green and sustainable construction that able to increase the

efficiency of resources while sustaining natural resources for the future generation and also reduce impact on human for better tomorrow. Moreover, a sustainable infrastructure rating tool is currently under development by the CIDB to ensure that all building and infrastructure projects in the construction industry in Malaysia are sustainable and green by 2020.

# SUSTAINABILITY CONSTRUCTION POLICY AND MARKET IN MALAYSIA



**21<sup>st</sup> AsiaConstruct**  
24 November 2016

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Policy & Corporate Sector  
CIDB Malaysia

One of the  
best economic growth  
records in Asia

# ECONOMIC OVERVIEW

Achieved a STABLE real GDP

6.2%

per annum since 1970

transforming from

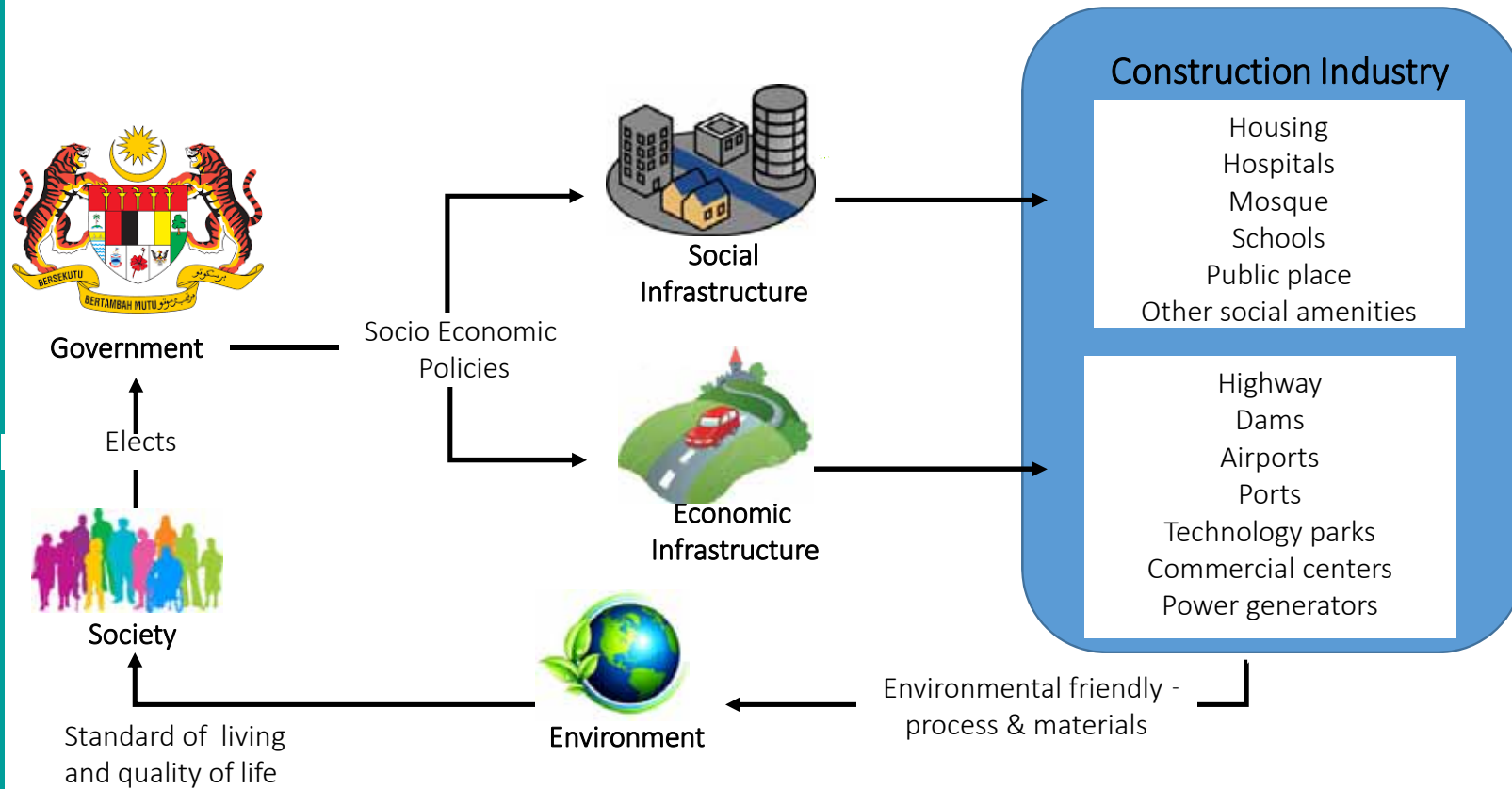
Agriculture  
Based  
1970s

Manufacturing  
1980s

Modern Services  
1990s



# CONSTRUCTION INDUSTRY IN MALAYSIA





A wide-angle photograph of a modern cable-stayed bridge with a prominent arch structure. The bridge spans a river, and in the background, a city skyline is visible under a blue sky with scattered white clouds. The bridge's design features a large, dark, curved arch supported by numerous cables. The river below has a concrete structure with a railing. The overall scene is bright and clear.

# SUSTAINABLE CONSTRUCTION IN MALAYSIA



# INTRODUCTION

## DEFINITION OF SUSTAINABILITY

Meet the needs of present without compromising the ability of future generations to meet their own needs



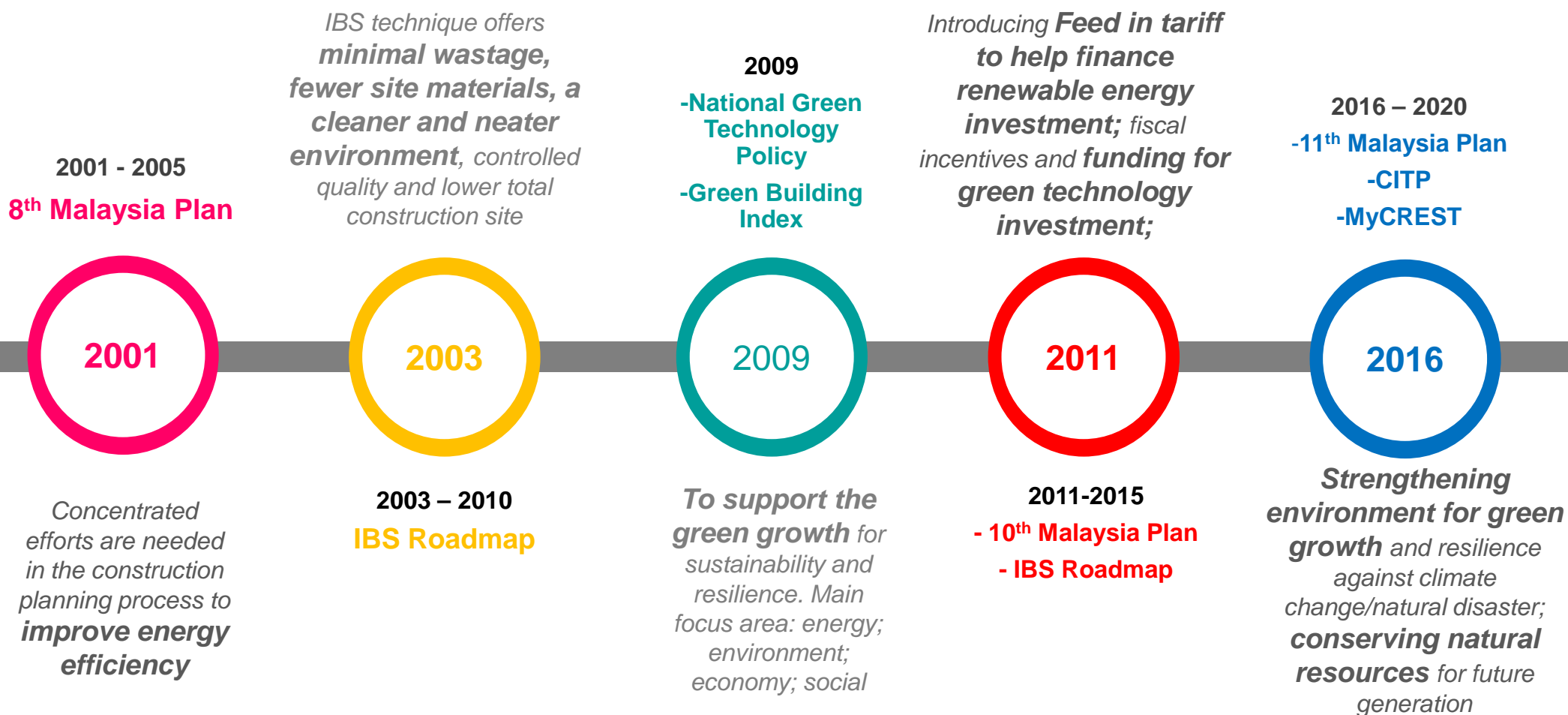
- Create new market & business opportunities
- Cost reduction
- Added Value



- Provide basic need (ie: education/ cultural activities)
- Enhance quality of life
- Integrate disable community
- Protect future generation's right

- Protect the diversity of life and earth
- Conservation of life support system
- Usage of renewable resources
- Protect cultural and historical environments

# MALAYSIA SUSTAINABILITY JOURNEY



IBS

## Barriers to IBS Implementation by Malaysian Contractor

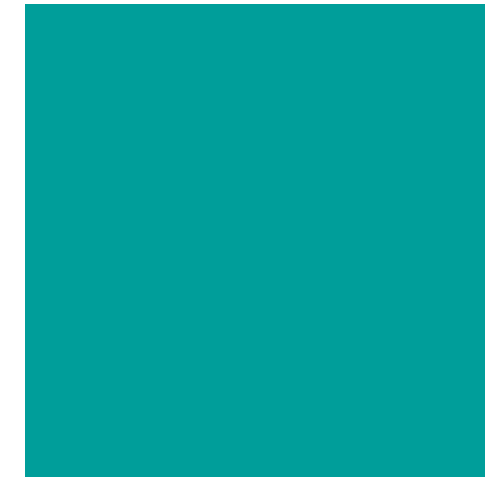
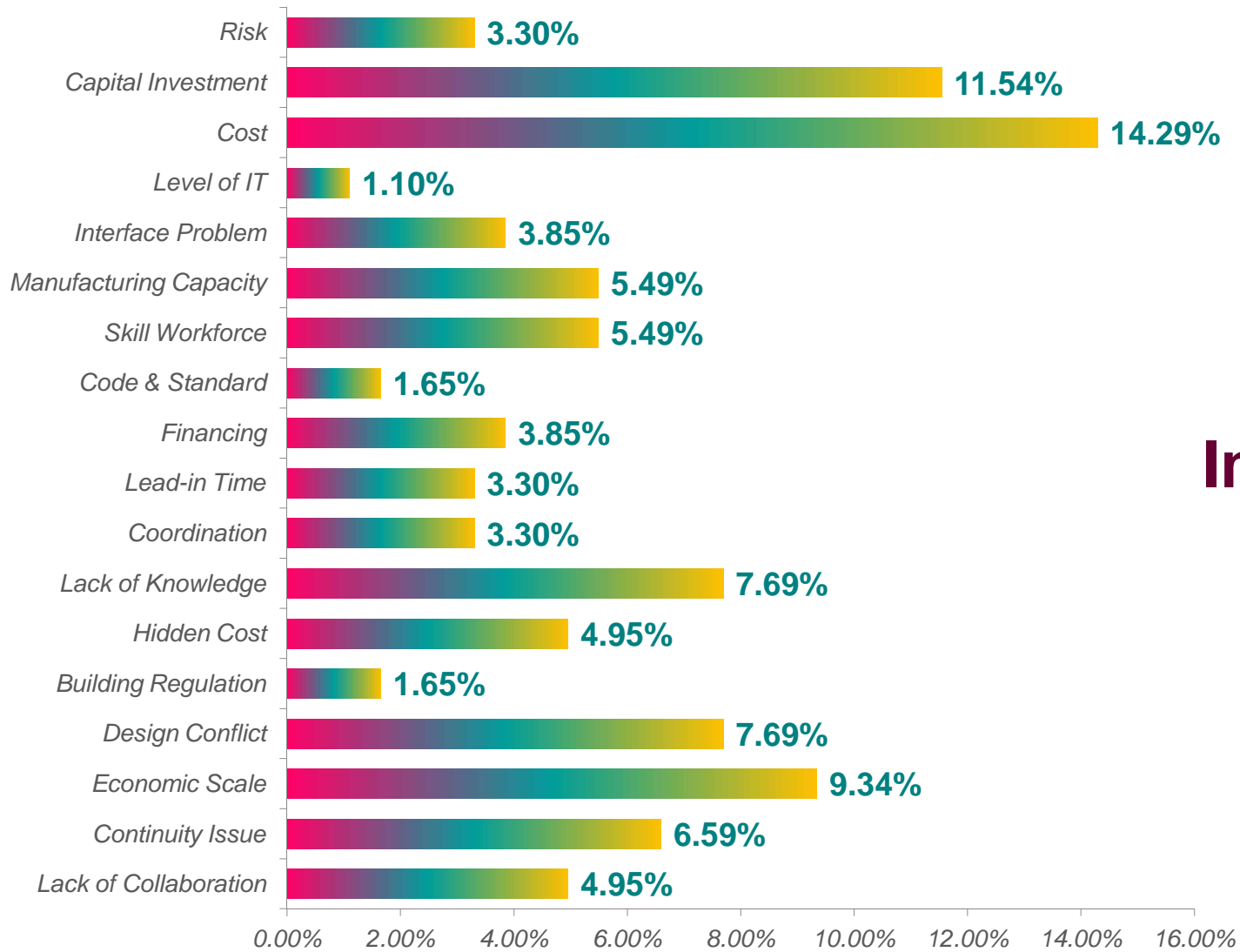
Financial  
Constraint of  
Key Practioners



Lack of Knowledge and  
Awareness



**MAIN ISSUES AND  
CHALLENGES IN  
SUSTAINABLE DEVELOPMENT**



# Barriers to IBS Implementation by MALAYSIAN CONTRACTOR

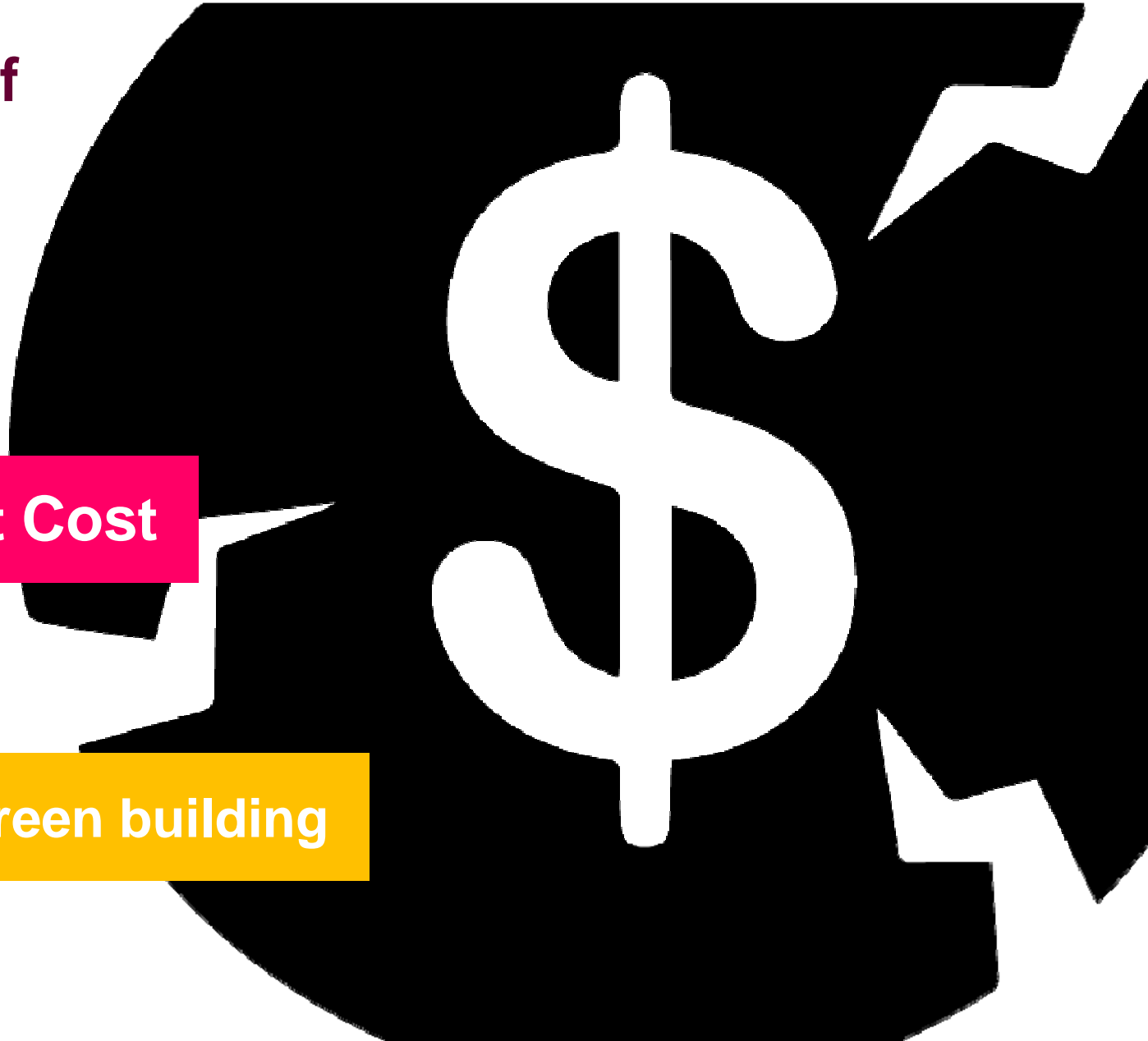
Source: Kamar et.al (2012)

# Financial Constraint of **KEY PRACTITIONERS**

**Higher investment Cost**

**Profit Driven**

**Low market demand on green building**





# SUSTAINABILITY INITIATIVES IN MALAYSIA CONSTRUCTION INDUSTRY

# Resilience and Sustainability in

# RMK 11





**1** Enhancing inclusiveness towards an equitable society

**2** Improving wellbeing for all

**3** Accelerating human capital development for an advanced nation

**4** Pursuing green growth for sustainability and resilience

**5** Strengthening infrastructure to support economic expansion

**6** Re-engineering economic growth for greater prosperity

# RMK-11

## 6 Strategic Thrusts

*Green growth refers to growth that is resource-efficient, clean and resilient. It is a commitment to pursue development in a more sustainable manner from the start, rather than a more conventional and costly model of 'Grow first, clean up later'. A reinforced commitment to green growth will ensure that Malaysia's precious environment and natural endowment are conserved and protected for present and future generations.*



**Strengthening the enabling environment for green growth**



**Adopting the sustainable consumption and production concept**



**Conserving natural resources for present and future generations**

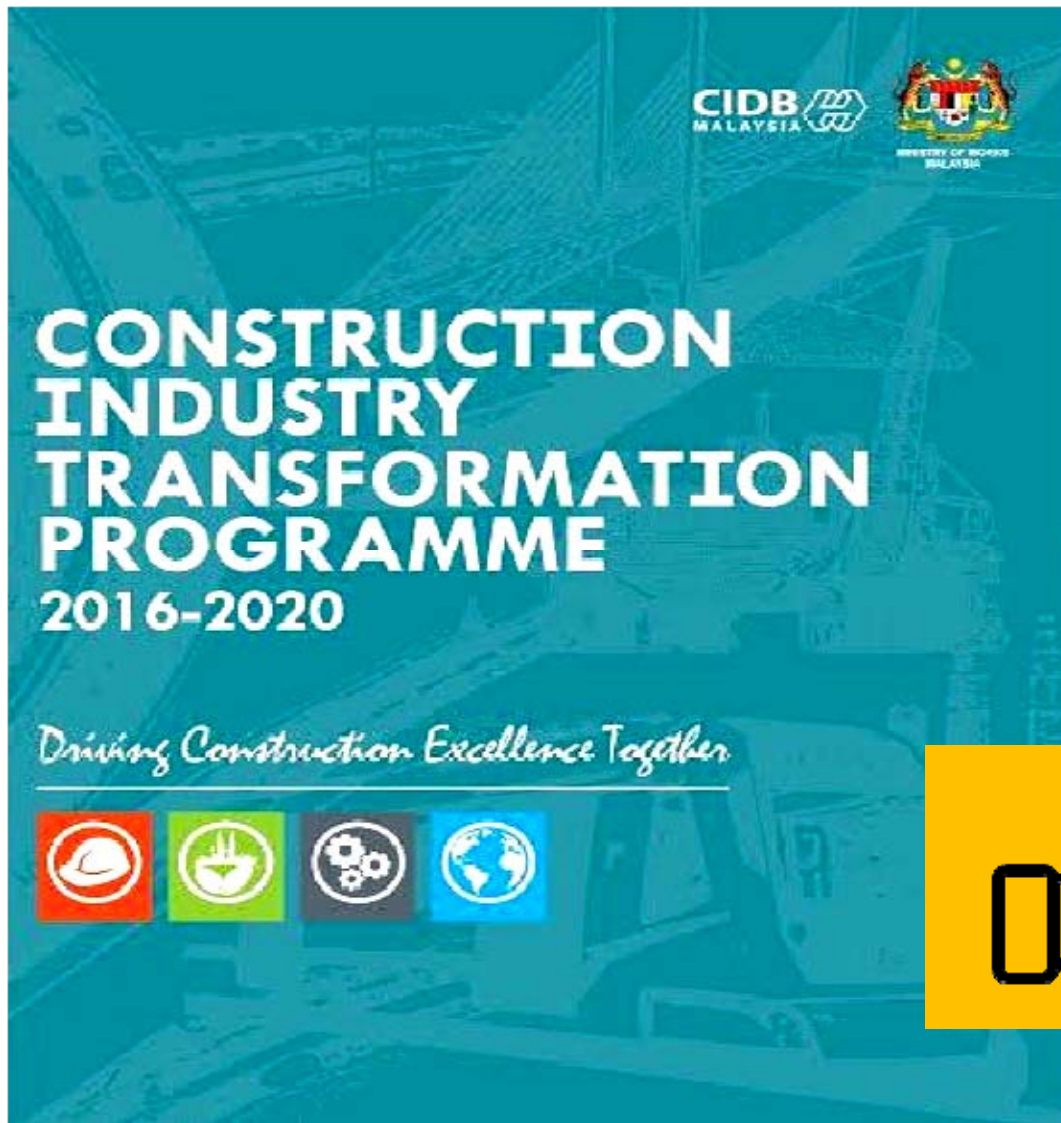


**Strengthening resilience against climate change and natural disaster**



**CONSTRUCTION  
INDUSTRY  
TRANSFORMATION  
PROGRAMME  
2016-2020**  
*Driving Construction Excellence Together*

CITP 2016 - 2020



# CITP

Is Malaysia national agenda to transform the construction industry towards becoming highly productive, **environmentally sustainable** with globally competitive players and a focus on safety & quality standards



**QUALITY, SAFETY  
& PROFESSIONALISM**

Quality, safety and professionalism to be ingrained in industry culture



**ENVIRONMENTAL  
SUSTAINABILITY**

**Malaysia's sustainable construction to be a model for the emerging world**



**PRODUCTIVITY**

More than doubling productivity, matched by higher wages



**INTERNATIONALISATION**

Malaysian champions to lead the charge locally and globally

# Expected Outcomes from 4 STRATEGIC THRUSTS OF THE CITP

Quality, Safety & Professionalism



Quality, safety and professionalism ingrained in industry culture

More than **50%** public projects exceed acceptable QCLASSIC score



More than **50%** reduction in worksite fatalities and injuries

Ease of Doing Business indicator in dealing with construction permits improved by 5% points

Environmental Sustainability



Malaysian sustainable infrastructure: a model for the emerging world

**100%** of large infrastructure projects exceed sustainability requirements



**4 Mt CO<sub>2</sub>** equivalent reduction per year

Productivity



More than doubling productivity, matched by higher wages



**2.5x increase** in productivity to US\$16,500 per worker

Internationalisation



Malaysian Champions: Leading the charge locally and globally

**10** companies achieve 5\* SCORE rating

**50** Malaysian companies earn G8 Status

**10** more constructions-related companies export construction services in the global market

# CITP INITIATIVES FROM THE 4 STRATEGIC THRUSTS

## Quality, Safety & Professionalism



- Q1 Increase emphasis on quality and implement quality assessments
- Q2 Improve workplace safety and workers' amenities
- Q3 Improve ease of doing business by addressing regulatory constraints
- Q4 Promote and raise awareness of CITP initiatives
- Q5 Enhance integrity and increase governance (NEW)

## Environmental Sustainability



- E1 Drive innovation in sustainable construction
- E2 Drive compliance to environmental sustainability ratings and requirements
- E3 Focus on public projects to lead the charge on sustainable practices
- E4 Roll out technology Facilitate industry adoption of sustainable practices
- E5 Reduce irresponsible waste during construction

## Productivity



- P1 Continue investment in human capital development in construction
- P2 Enhance control and balance of workforce supply
- P3 Accelerate adoption of IBS, mechanisation and modern practices
- P4 Roll out technology advantage across project life-cycle
- P5 Enhance availability of strategic information via NCIC
- P6 Advance SME / Bumiputera capacity and capability-building

## Internationalisation



- I1 Internationalise construction practices and standards
- I2 Strengthen access to financing for Malaysian champions going abroad
- I3 Support consortia formation and strengthen overseas market intelligence
- I4 Intensify contractor's capacity and capability building

# Case for change: Low climate resilience of Malaysian infrastructure and construction

## MY infrastructure and construction industry lack emphasis on Sustainability...

Natural disasters point to limits on sustainability of infrastructure to weather damage

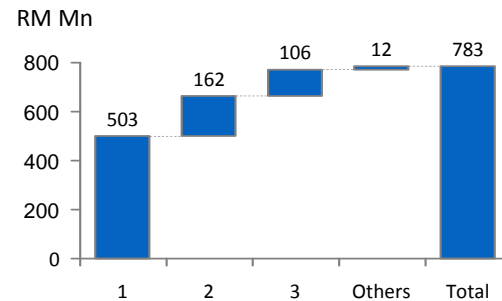
Floods from December 2014 to January 2015 affected lives of many Malaysians:

- **21** people dead
- Nearly **400,000** people affected
- Damage to infrastructure ~**RM 2.9Bn**
- **RM 893Mn** government budget provided for mitigation projects
- 3.5% of palm oil plantation area affected, dropping output by **20%**



## ... investment in sustainable design and construction can mitigate effects of natural disasters

~RM 783 Mn value expected for 2016 and beyond<sup>1</sup>



1. Reduced cost of annual flood damage / emergency flood relief
2. Reduced operation and maintenance costs
3. Increased competitiveness and faster growth of construction industry
4. Other benefits

## Target: Centre of Excellence for Sustainable Construction to promote sustainability

Malaysia as a leader in sustainability in ASEAN and beyond

Increased competitiveness of construction industry

Cost savings across infrastructure projects

Inculcate sustainability as top of mind for future MY leaders

### Increase infrastructure climate resiliency and sustainability

- Adoption of MyEnvision rating by 100% Public infrastructure projects > RM 100 Mn

1.. Benefits modeled based on value creation levers between 2016-2020, only select levers shown above. Note. all figures in RM unless otherwise stated, discounted by 10% to get present value. Source: CIDB report, BCG-MIT Sustainability and Innovation Survey (2,136 responses), The Global Economy, Code for Sustainable Home study, DSM report, Stanford University report, Royal Academy of Engineers Report, BCG

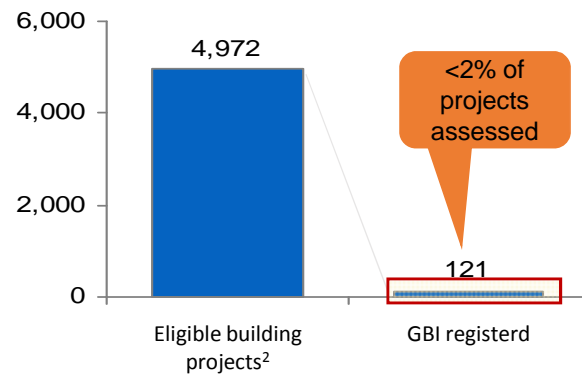


# Case for change: Low level of sustainability measurement assessment, rating and certification

## Lack of sustainability assessment practices ...

Low adoption of sustainability rating

Local projects registered for GBI rating



"There is no baseline of how Malaysian construction is doing in environmental sustainability agenda. We don't know where we lack and where to start from"

-Director of RISM

## ... due to lack of strategic push of standard system

Too many building sustainability rating systems in the market ..



...while no infrastructure rating system in the market

limited coverage by:



"It is confusing which rating system we should use for buildings. There is just way too many out there, while there is none for infrastructure"

-Deputy CEO of MBAM

## Target: Require use of std. rating and certification

Mandate sustainability assessment on large-scale public projects

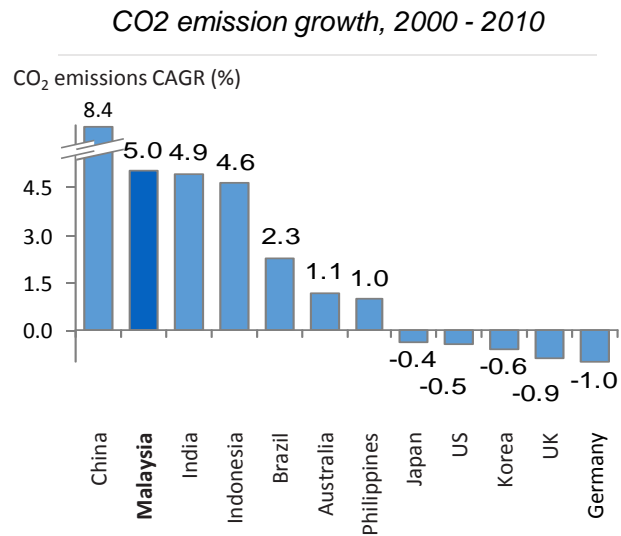
Mandate ISO 14001 certification for mega projects / G8 contractors

Sustainability rating assessed for **100%** of projects valued over RM 100Mn

**100%** of G8 or G7 contractors w/ projects valued over 500Mn have ISO 14001 certifications

# Case for change: Environ. sust. of Malaysian construction projects considered low and CO<sub>2</sub> emissions are growing

## Malaysia committed to reverse its rapid CO<sub>2</sub> emission growth ...

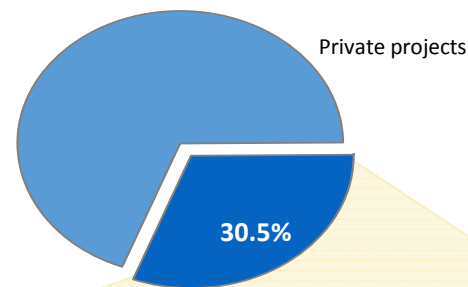


"Target to achieve 40% voluntary reduction in carbon emission...by 2020"

-PM of Malaysia

## ... Public projects to play vital role in creating a momentum

% public project value in MY construction



### Public projects

- 1) Raise market demand for sustainable buildings by popularising
- 2) Provide opportunity for contractors to gain experience and expertise
- 3) Develop ecosystem for sustainability (e.g., suppliers)

## Target: Mandate sust. req't in public projects



All new public building projects to include sustainability requirement

20% reduction in CO<sub>2</sub> emission by public buildings



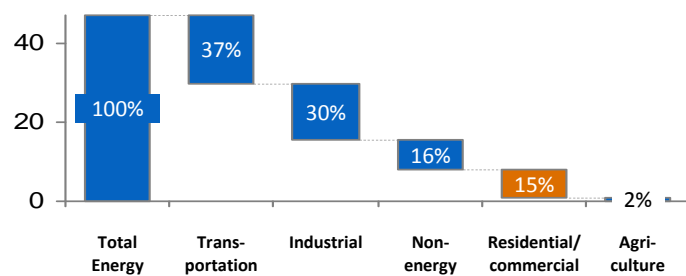
# Case for change: Lack of incentives to developers resulting in low level of environmentally sustainable developments

## Construction is a key energy consumer and emission contributor

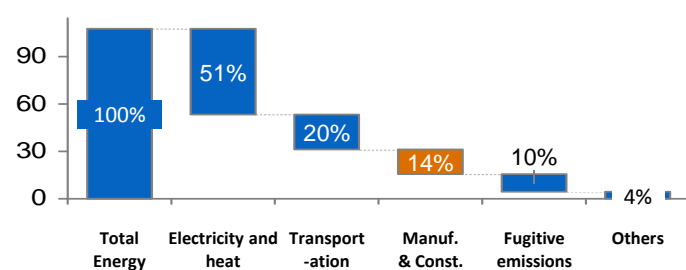
...

### Energy consumption / emission, 2011

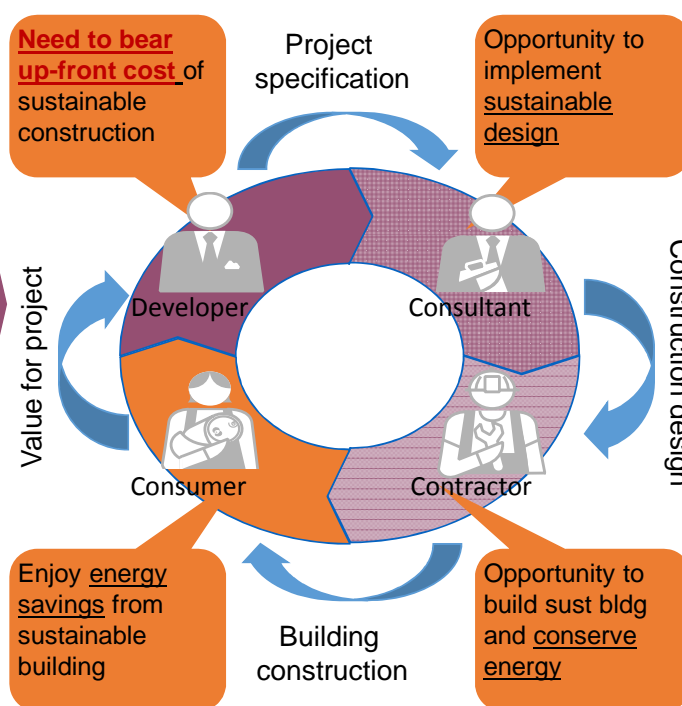
#### Energy consumption by sector (mtoe)



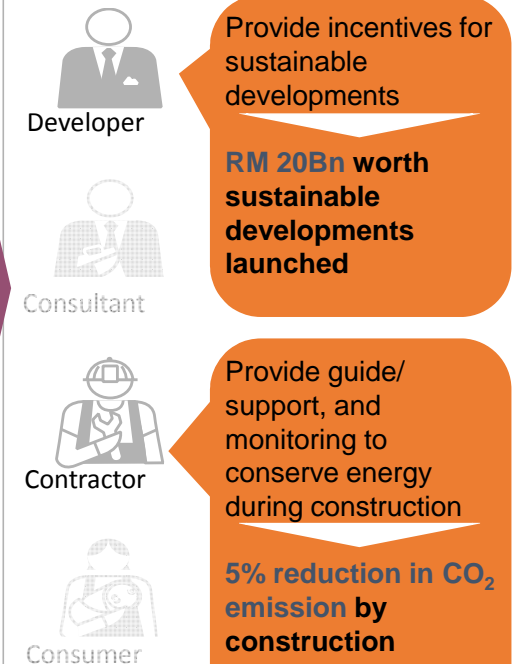
#### CO<sub>2</sub> emissions by sector (mt)



## ... but sustainability is difficult to inculcate in construction due to split incentive



## Target: Facilitate sustainable construction via incentives



# Recommendation: Need to heighten enforcement against illegal dumping and improve recycling infrastructure

## Recommendations

### 1 Reduce waste generation at source

- Develop and provide Site Waste Management Plan (SWMP) templates to industry players
- Mandate ISO EMS 14001 certification for G7/ G8 contractors and projects valued over RM 500Mn
- Install land-fill mechanism to penalise excessive waste generation

### 2 Heighten enforcement against illegal dumping

- Mandate SWMP submission for projects valued >RM 20Mn
- Develop and launch licensing scheme for waste transporter

### Facilitate recycling of construction and demolition wastes

- ### 3
- Build government recycling centres for C&D<sup>1</sup> waste
  - Facilitate private sector recycling centre participation
    - i.e., partner with existing centres to recycle C&D waste
    - i.e., financial incentives to build C&D recycle centre
  - Amend MOF policies to encourage/ mandate use of recycled construction materials

## Supplementary information

- Landfill-tax mechanism
  - Develop waste intensity for different project types and values
  - Higher tax rate on waste over adequate tonnage for the project
- Waste transport licensing scheme
  - Only licensed businesses to transport C&D wastes
  - Increases JPSPN ability to track waste generation by each construction project
- C&D waste recycling programme
  - Identify construction components to allow recycled materials
  - Develop recycled material quality certification mechanism



## FUTURE DIRECTION FOR SUSTAINABLE CONSTRUCTION IN MALAYSIA

Sustainability ratings measured for all new development projects valued > RM100Mn **100%**

Sustainable specification mandated in procurement of common public buildings/ infrastructure

Construction/ demolition waste (tonnage) to landfills reduced by 20% from 2016 baseline by 2020

thank you!

