CONSTRUCTION INDUSTRY TRANSFORMATION PROGRAMME
2016 - 2020

Driving Construction Excellence Together
CONSTRUCTION INDUSTRY TRANSFORMATION PROGRAMME 2016-2020

Driving Construction Excellence Together
The importance of the construction industry to Malaysia’s economy cannot be overstated. Construction in Malaysia has traditionally been a substantial driver of growth, and looking to the future, we expect this trend to continue and expand.

Dato’ Sri Mohd Najib bin Tun Haji Abdul Razak
Prime Minister of Malaysia
The Eleventh Malaysia Plan (RMK11) and the Economic Transformation Programme (ETP) are at the core of our nation’s aspirations towards a robust and dynamic economy. A vibrant construction industry is vital to RMK11 and ETP, as both of these plans call for significant physical infrastructure developments with which we look to literally build our future, and realise our shared dreams.

The Construction Industry Transformation Programme (CITP) represents a major step forward in streamlining the construction industry and preparing it for a major leap forward. Building on the success of the Construction Industry Master Plan (CIMP), CITP is poised to lay the groundwork for an era of unprecedented progress and growth in the industry.

The CITP envisions an advanced, highly productive construction industry that will be a major contributor towards Malaysia’s ambition of becoming a high-income nation by 2020. A modernised construction industry will create prosperity at all levels of society, and provide a steady flow of high-income employment for Malaysians.

A key feature of the CITP is to prepare Malaysia’s construction industry for competition at the global level. We anticipate that home-grown Malaysian companies will be successful in bidding for projects from all around the world. The government fully supports this push towards fostering global competitiveness and building up an international profile for Malaysian companies.

I would like to thank and congratulate all who have worked together in developing the CITP. Hand in hand, we will work together towards achieving our shared goals, and making our dreams of prosperity for all a reality. God willing, we will have the courage and determination to build the future we envision.
The construction industry, which is one of Malaysia’s fastest growing industries, has recorded double digit growth over the last few years. This is expected to continue being an important driver for the economy and a key generator of skilled jobs for Malaysians as we progress towards a high income nation.

Dato’ Sri Haji Fadillah Haji Yusof
Minister of Works
Recognising the need to support our national imperatives, the Ministry of Works, through the Construction Industry Development Board (CIDB) has proactively developed the Construction Industry Transformation Programme (CITP) to empower and strengthen the construction industry as espoused in the thrusts of the Eleventh Malaysia Plan (RMK11). The CITP, which is the culmination of a series of engagements with the various government agencies, research institutions and industry players, is critical as we position the nation for global competitiveness.

The CITP, which sets important strategic goals and milestones to bring Malaysia’s construction industry to the next level, aims to transform the construction industry encompassing four strategic thrusts: 1. raising the overall productivity level of the industry 2. environmental sustainability being incorporated in the design, construction, and subsequent maintenance of our building and infrastructure 3. focusing on improving competitiveness in the capability and capacity of our industry players to foray internationally 4. improving the overall quality, safety and professionalism of the industry.

As such, the Government and private sector need to work synergistically in ensuring the success of the CITP. Thus, the leadership position taken by the Ministry of Works in spearheading this collaboration is timely and vital as the outcomes derived from and within each sector of the industry will guarantee the socio-economic wellbeing of the nation. Moving forward, I am hopeful this synergy will continue to grow and flourish for all stakeholders within the construction industry in ensuring the successful implementation of the CITP.
The construction industry touches the lives of practically everyone on a daily basis and occupies a fundamental position in our economy.

Dato’ Sri Zohari bin Haji Akob
Secretary General, Ministry of Works
The industry is often regarded as the bellwether of economic growth, and Malaysia has done well by posting strong growth here over the past decade. In anticipation of further growth upcoming with the Eleventh Malaysia Plan (RMK11), we will need to secure sustainable growth in the construction industry in our outlook for the future. For that we need a strategy that builds on our progress in the past decade, while steering an industry transformation befitting our High Income status aspirations. That is the philosophy behind the Construction Industry Transformation Programme (CITP).

Transformation of an entire industry is never easy. There is no one-size-fits-all methodology to follow, and the CITP therefore takes a bespoke, multi-pronged approach to address the industry holistically. To make transformation stick, there will be an emphasis on ingraining quality, safety and professionalism within the industry culture. Initiatives will be in place to take environmental sustainability more seriously, in line with our responsibility to build for the future. There will be a concerted effort to raise productivity across the sector, raising at once the skills levels and technology, while raising the uptake of mechanisation and modern construction methods. We will also prepare our Malaysian champions in the construction industry to prevail globally in this era of globalisation and free movement of factors.

CITP is an ambitious plan but one that is very much achievable with the joint commitment and support of the many critical stakeholders that comprise the industry ecosystem, both government and private. Many of you across the ecosystem have already come forward with your Pledges of Support for CITP. The Ministry of Works invites more of you to join us as we march ahead on this collaborative journey. Together we are resolute, ready, willing and able to overcome the challenges that may stand in our way to reach our goals.

The CITP will be a necessary means toward reaching our shared goals by 2020. I am optimistic that this programme will truly transform the Malaysian construction industry and future-proof it. I take this opportunity to extend my sincere thanks to everyone who have invested time and energy in developing the CITP. I eagerly anticipate just how much we can achieve together going forward.
The Construction Industry Development Board (CIDB)’s primary mission is to develop our construction industry into a world-class industry that is able to compete locally and abroad.

Tan Sri Dr. Ahmad Tajuddin Ali FASc, PEng
Chairman
Construction Industry Development Board (CIDB) Malaysia
With a broad objective in mind, CIDB has over the years implemented wide ranging programmes, initiatives and activities to enable the industry and enhance the capacity and capability of industry players and the workforce. This includes emphasis on key aspects such as quality, safety, professionalism as well as the continuous adoption of modern construction practices and technology.

We have witnessed the industry grow over the years and attract significant investments as well as nurture a number of local players that are able to grow and compete both in Malaysia and abroad. Nevertheless, we still need to do more.

The demand for construction in Malaysia is expected to grow further, especially as our economy continues to expand. The expected growth is evident in the Eleventh Malaysia Plan (RMK11) that estimates the construction industry to expand by 10.3 per cent per annum over the next five year period. The growth will come from the increasing demand for housing, especially for the middle income group as well as continued investments into large-scale projects such as new power plants, highways, urban transportation systems, ports and airports. These demands will translate into the need to supply better quality homes, more efficient buildings as well as more sophisticated infrastructure especially for our towns and cities.

We will see a greater number of foreign investors, construction players, professionals and consultants interested in Malaysia – bringing along with them specialised skills and technology. We will see the marketplace becoming even more competitive for both local and foreign players.

Taking cognisance of the challenges ahead, CIDB, with the guidance of the Ministry of Works, in collaboration with key stakeholders and the industry as a whole, has embarked on a programme to further strengthen the foundations of the industry. The Construction Industry Transformation Programme (CITP) encapsulates the national collaborative efforts required for the continued growth and success of the Malaysian construction industry.

Together we will forge ahead to realise this future.
The construction industry will continue to evolve and become increasingly critical as Malaysia transitions to a developed nation.
Four Strategic Thrusts

4.1 Quality, Safety & Professionalism
- Case for change 64
- Initiatives 67

4.2 Environmental Sustainability
- Case for change 86
- Initiatives 89

4.3 Productivity
- Case for change 108
- Initiatives 117

4.4 Internationalisation
- Case for change 144
- Initiatives 148

Enablers

Robust governance 166
Strong coordinating body 167
Effective industry collaborations 167

Moving Forward

Glossary

Acknowledgements
LIST OF CASE STUDIES AND BENCHMARKS

Case Studies

1. Take up of QLASSIC by large developers in Malaysia
2. Housing workers in the MRT Project
4. Leading environmental sustainability efforts through SP Setia’s Flagship projects
5. IJM-Sunway-Zelan-LFE consortium in Abu Dhabi, United Arab Emirates

Benchmarks

1. Singapore government plays a critical role in driving better worker living conditions
2. UK Public-Private Partnership Model for Construction Permit Approvals
3. Australian Administrative Appeals Tribunal (AAT)
4. Public works in the UK to raise sustainability
5. Expedited approvals of sustainable projects in San Diego
6. Brownfield tax in the United States
7. Green Deal in the United Kingdom
8. Guidance and penalties on poor waste management in the United Kingdom
9. Construction Industry Advisory Committee ensures development of training standards in Australia
10. Implementation of apprenticeship programmes in Australia
11. Strengthening of buildability legislative framework by increasing mandatory requirements in Singapore
12. A set of guidelines for BIM published by the UK Building Information Modelling (BIM) Task Group
13. BCA Singapore project pipeline
14. UK government publishes upcoming public sector projects
15. Enforcement of material standards in South Korea, Germany and China
16. Cost-sharing feasibility study grant in South Africa
17. Project bundling by the Swedish government
EXECUTIVE SUMMARY

Overview of the Malaysian Construction Industry

The construction industry is crucial to the Malaysian economy and its growth. The construction industry currently contributes 4 per cent to the Malaysian Gross Domestic Product (GDP)\(^1\) and is expected to contribute 5.5 per cent to the Malaysian GDP up to 2020\(^2\).

The industry has a two-times multiplier effect, with more than 120 other industries relying on construction for their growth and sustainability. For example, construction consumes 15 per cent of total manufacturing output.

The industry provides significant employment opportunities with a registered workforce of 1.2 million, representing 9.5 per cent of Malaysia’s total workforce\(^3\). 75 per cent of the workforce in the construction industry are resident Malaysians. Employees in the industry include professionals such as engineers, architects, planners, and surveyors, in addition to skilled and non-skilled construction workers. Each year, thousands of young Malaysians enrol in technical and vocational institutes as well as universities to undertake courses relevant to the construction industry. The significance of the industry will continue to evolve and it will become increasingly critical as Malaysia becomes a developed nation. Malaysians will require more energy-efficient and higher quality buildings, infrastructure and cities. Today, we are already seeing intense demand for infrastructure development such as in Sabah and Sarawak with the Pan-Borneo Highway as well as for more efficient urban transportation, such as the Mass Rapid Transit (MRT) project in the Klang Valley. This rise in demand will in turn require construction players and the workforce to continually raise its capabilities.

---

1. Bank Negara Malaysia, 2014
2. 11th Malaysia Plan
3. Department of Statistics, Malaysia, 2013; Latest available data
CONSTRUCTION INDUSTRY IS CRUCIAL TO THE ECONOMY

120+ INDUSTRIES rely on construction industry

- ~4% of GDP, 2x multiplier
- e.g., consumes 15% of total manufacturing output

~RM 500 Bn in project value (2011 – 2014)
- Increasing at rate of 8% per annum

75% resident Malaysians

9.5% of workforce
- 1.2 million registered workers
- Includes engineers, architects and surveyors
- Thousands enrol in TEVT and university courses

Sizeable entrepreneurial activity
- ~90% of firms are SMEs

Inclusive and providing opportunities for Bumiputera
- 56% of firms

AND WILL BECOME EVEN MORE CRITICAL

Strong correlation with economic development
- Construction share of GDP positively correlated with GDP per capita

Major infrastructure projects planned make construction even more critical
- e.g., intense demand for infrastructure development in Sabah and Sarawak
- e.g., demand for more efficient urban transportation
Despite many initiatives and programmes being implemented over the years, real and substantial issues still persist in the construction industry. These include limited emphasis on quality in workmanship and quality assessments, limited levels of safety awareness and enforcement, added constraints to the industry due to regulations and bureaucratic procedures, and public perception of the industry that can be negative. Besides that, there are issues of resilience of construction works to natural disasters, high carbon emissions and energy use coupled with high contribution of construction waste to landfills. Further, there is the need to increase the adoption of technology and modern methods of construction, the quality of training to align supply and demand of workforce, the availability of high-quality information, and to address the low productivity and scale of Bumiputera companies. In addition, Malaysian companies are experiencing increasing competition from foreign players, and constraints in going abroad, including financing and market intelligence to win in target overseas markets.

Accelerating the development of the Malaysian construction industry and preparing it to meet the future demands of the economy will thus, require an industry transformation. The Ministry of Works (MOW), collaborating with its agencies and more specifically, the Construction Industry Development Board (CIDB) has spearheaded the development of this Construction Industry Transformation Programme (CITP).

Given the strong interdependencies between construction and the other sectors in the economy, this transformation of the construction industry will need to be the joint effort of stakeholders across government ministries and agencies, industry players, professional boards and associations, universities and research organisations.

A wide range of stakeholders has therefore been involved in the development of the CITP, as their input and support for implementation are critical for the CITP to be successful.

The CITP has been presented at the National Development Planning Committee (NDPC) on 11th March 2015 and at the Special Committee for the Services Sector (SCSS) on 16th March 2015, chaired by YAB the Prime Minister. Subsequently, the CITP was also presented to the Cabinet Ministers at a Cabinet Away Day on 21st May 2015, followed by the submission of a Cabinet Paper.

Four strategic thrusts have been identified to guide the transformation and continued development of the construction industry and to address the issues mentioned above: Quality, Safety and Professionalism, Environmental Sustainability, Productivity and Internationalisation.
Each of the four strategic thrusts seeks to transform the industry and change the way it is being perceived. The outcomes of CITP are thus to transform the industry and achieve the following:

<table>
<thead>
<tr>
<th>QUALITY, SAFETY &amp; PROFESSIONALISM</th>
<th>WHERE WE ARE TODAY</th>
<th>WHAT WE ASPIRE TO BE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited emphasis on quality and assessments; with limited safety awareness as well as added regulatory constraints within the industry</td>
<td>Quality, safety and professionalism to be ingrained in industry culture</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ENVIRONMENTAL SUSTAINABILITY</th>
<th>WHERE WE ARE TODAY</th>
<th>WHAT WE ASPIRE TO BE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevalence of construction practices that are inefficient and risk harming the environment</td>
<td>Malaysia’s environmentally sustainable construction to be a model for the emerging world</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRODUCTIVITY</th>
<th>WHERE WE ARE TODAY</th>
<th>WHAT WE ASPIRE TO BE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largely low-skilled construction workforce, with the industry highly dependant on low skilled foreign workers</td>
<td>Productivity of the industry is more than doubled, matched by higher wages</td>
<td></td>
</tr>
<tr>
<td>Industry productivity levels is one of the lowest in the economy and as compared with developed economies, with slow uptake on technology and modern practices</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTERNATIONALISATION</th>
<th>WHERE WE ARE TODAY</th>
<th>WHAT WE ASPIRE TO BE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysian construction players yet to emerge as real contenders on the global stage, and facing decline in local market share</td>
<td>Malaysian champions to lead the charge locally and globally</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 Where we are today and where we aspire to be
Quality, safety and professionalism contribute to the Inclusiveness goal under the 11th Malaysia Plan

A more quality-conscious and inclusive construction industry will ensure higher levels of quality in the built environment, reduce worksite accidents and remove regulatory constraints

The incentive to achieve higher QLASSIC scores will encourage adoption of technology and modern methods of construction.

QUALITY, SAFETY AND PROFESSIONALISM TO BE INGRAINED IN THE INDUSTRY CULTURE

Quality, safety and professionalism are prerequisites for transforming the construction industry into a responsible, developed industry. Today, high accident and fatality rates, limited integration of safety into the work culture, poor quality construction work and collapsing infrastructure, and delays in obtaining approvals for construction permits are some of the major issues that still persist in the industry today. These challenges affect the general public, businesses, workers and consumers.

The CITP strongly emphasises the improvement of quality standards in the industry. It lays out initiatives to increase the implementation of the Quality Assessment System in Construction (QLASSIC). QLASSIC is a system that measures the quality of workmanship of a building based on the Construction Industry Standard that acts as a yardstick for the industry, as well as serving as broader quality assurance for construction. Further, the requirements to achieve high QLASSIC scores are not easily met through the conventional method of construction. Thus, the incentive to achieve higher QLASSIC scores will encourage adoption of technology and modern methods of construction such as Industrialised Building System (IBS) to improve precision of material and workmanship.

To raise the take-up of QLASSIC, a multi-pronged approach has been recommended. On the regulatory side, QLASSIC is targeted for inclusion as requirements under the Certificate of Completion and Compliance (CCC), the Certificate of Practical Completion (CPC) and the Sales and Purchase Agreement (SPA). On the demand side, public awareness on the disclosure of QLASSIC and other quality assessment scores will be raised. The CITP also recommends training a sufficient number of capable quality assurance personnel and introducing independent assessors for objective quality assurance and quality compliance. Raising the standards of quality in construction will not only benefit the industry, but will also accrue to the public, consumers, and the overall economy.

The CITP puts forward measures to raise safety levels in the industry. More stringent requirements on occupational safety and health will be introduced. A minimum set of standards for workers’ amenities will be set through revised regulations. In addition, the requirement for...
“Malaysia has set a target to become an advanced economy by 2020. This will be achieved in a resilient, low-carbon, resource-efficient, and socially-inclusive manner. In 2009, Malaysia set a voluntary target of reducing the greenhouse gases (GHG) emission intensity of its Gross Domestic Product (GDP) by up to 40 per cent compared to 2005 levels by 2020.”

11th Malaysia Plan / Chapter 6 / Pursuing green growth for sustainability and resilience

Occupational safety and health certifications will be heightened, and will be supported by a stronger enforcement team of occupational safety and health officers and inspectors. Further, standards and Codes of Practice governing construction safety and health will be introduced.

To raise the overall levels of professionalism in the construction industry, and improve the ease of doing business, the CITP aims to reduce regulatory obstacles. Measures that are being considered include the potential to set up a tribunal to resolve disputes in dealing with construction permits in the industry, and introducing the integration and automation of construction permit submissions and approvals, as well as contractor registration. The removal of regulatory obstacles will further improve the ease with which transactions are carried out in the industry and reduce the high cost of resolving regulatory disputes, thus conferring benefits to the industry.

MALAYSIA’S SUSTAINABLE CONSTRUCTION TO BE A MODEL FOR THE EMERGING WORLD

Environmental sustainability calls for compliance with environmentally sustainable practices in order to showcase Malaysia as a low carbon, sustainable building and infrastructure hub. Irresponsible dumping of construction and demolition waste as well as damage and repair expenditure after natural disasters are key issues to be addressed.

Cognisant of Malaysia’s role in the global economy to achieve a more sustainable world, Malaysia has made a voluntary pledge to reduce the country’s carbon emissions per GDP by 40 per cent by 2020 from 2005 levels.

4. UN Climate Change Conference, 17 December 2009; 11th Malaysia Plan
Acknowledging the importance of sustainability to national interests, the CITP calls for the establishment of Malaysia’s preeminent research platform to drive sustainable construction excellence in the industry. Holistic rating tools will be developed and promoted with incentive programmes to encourage sustainable projects.

To avoid irresponsible construction and demolition waste, recycling centres for construction and demolition waste are recommended in priority areas with high levels of construction activity. Enforcement against illegal dumping will be heightened, along with the introduction of a taxation mechanism on excessive waste. This will benefit the industry as recycled materials can in turn be used for other projects and purposes. The implementation of improved waste management practices will further benefit industry players by lowering the cost of disposal of waste and will help reduce amount of material procured from the outset.

CITP also recommends including sustainability requirements within the procurement process for public buildings and infrastructure for key ministries as a leading example for the industry.

**PRODUCTIVITY OF THE INDUSTRY IS MORE THAN DOUBLED, MATCHED BY HIGHER WAGES**

Productivity is the primary engine of growth towards Malaysia’s high-income target. Today, the construction industry has one of the lowest productivity levels in the economy. The relatively low productivity level reflects the industry’s need to adopt modern technologies and practices, and reduce its reliance on low-skilled construction workers.

The CITP puts forward measures to raise productivity levels. A key recommendation is for the continuous up-skilling of the local workforce and entrepreneurs (including Bumiputera SMEs), to equip them with specialised skills that raise their capabilities and in turn income and wages. Construction-related training courses nationwide will be reviewed, streamlined, and upgraded or developed where appropriate. The quality and quantity of trainers will be increased. Targeted programmes such as Specialist Apprenticeships will be rolled out together with industry partners and global organisations. A comprehensive manpower planning model will be developed, which will help to identify the target size and skills mix for workers and professionals required by the industry. At the same time, mechanisms to raise the skills mix of foreign workers such as a tiered-visa system is highly recommended. Over time, this will reduce the reliance on low-skilled workers and attract more skilled local workforce into the industry.

In addition, the CITP calls for the adoption and utilisation of modern construction methods and technologies to address productivity challenges in the industry. The CITP builds on existing measures to accelerate the adoption of Industrialised Building Systems (IBS). For example, it recommends improving the economics of IBS adoption, raising the enablers for IBS adoption such as by introducing a comprehensive IBS catalogue harmonised with a Building Information Modeling (BIM)

---

**More than doubling productivity, matched by higher wages**

![Image](image_url)

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

1 per worker

1. at 2005 constant value

Measure for productivity is the average value in RM contributed by each worker.

Productivity contributes to the High Income goal by enabling higher output from the same inputs, or the same output from fewer inputs.

---

**Executive Summary**

Productivity contributes to the High Income goal by enabling higher output from the same inputs, or the same output from fewer inputs.
design library, and improving overall regulatory support. The CITP also calls for increased ICT adoption and mechanisation in the industry, and innovations in building research. To that end, collaborative partnerships will be enabled between the industry and universities to co-develop research and programmes on modern construction methods and technologies.

CITP recommends many initiatives that will raise standards. It also seeks to ensure Bumiputera participation in the industry, and ensure that Bumiputera players are able to perform effectively. Thus, the CITP also focuses on increasing the capability of Bumiputera contractors via training and developing more specialist contractors as well as streamlining multiple programmes to-date to achieve common monitoring and outcomes.

**MALAYSIAN CHAMPIONS TO LEAD THE CHARGE LOCALLY AND GLOBALLY**

Internationalisation is becoming an increasingly important avenue for Malaysian companies to capture growth beyond the domestic market. Malaysia’s Free Trade Agreements (FTAs) provide industries the opportunity to be part of a larger consumer market. Similarly, FTAs have also spurred foreign companies to increase their presence in Malaysia. This trend is expected to grow, especially given the upcoming FTAs that Malaysia plans to be a part of, such as the Trans-Pacific Partnership Agreement (TPPA). This changing environment is affecting the Malaysian construction industry and it will need to be able to adapt and respond to the increased competition and scrutiny.

The CITP puts forward measures to raise the performance of local construction players to meet expected international standards. This includes recommending the use of international or equivalent practices and standards, including the adoption of higher material standards and specifications. Grants for feasibility studies and the development of market entry strategies for target construction markets will be strengthened. The CITP also calls for the increase in targeted fact-finding missions and Malaysian participation in international construction forums. To improve the economics for larger companies who are ready to compete globally, access to international financing will be enhanced.

In addition, the formation of consortia in construction, both domestically and internationally (targeting international projects under the National Export Council’s National Export Strategy), will be encouraged and supported, including SMEs.

The CITP also aims to nurture the development of Malaysian ‘champions’ who will be industry leaders, both within Malaysia and abroad. Industry champions are often the most influential players driving the progress and direction of the industry. Having capable and effective Malaysian champions will drive the growth of the construction industry and this will benefit adjacent sectors in Malaysia, including in the manufacturing sector for building materials and supplies as well as professional service providers including financial services and the likes.
“If we pull together and work together with the maximum of goodwill and harmony, there is no limit to what our people can achieve in the years to come.”
Tunku Abdul Rahman Putra Al-Haj

MOVING FORWARD

Multiple ministries and agencies, as well as industry players, professional boards, associations and experts have shown their support and collaboration for CITP. This will need to continue going forward in an unprecedented manner to ensure the success of the overall implementation. The CITP charts the way forward for an industry that benefits the country and all Malaysians, and the responsibility is now on all stakeholders within the industry to collaborate and implement this transformation.
## Case for change, Initiatives, Key outcomes by 2020

### QUALITY, SAFETY & PROFESSIONALISM

**CASE FOR CHANGE**

- Lack of adequate emphasis on quality assessment and assurance
- Complex regulatory framework, processes and procedures, which lead to delays in permits and approvals
- Room to enhance public perception of the industry and awareness of initiatives to improve the image of the industry

**INITIATIVES**

- Increase emphasis on quality and implement quality assessments
- Improve workplace safety and workers’ amenities
- Promote and raise awareness of CITP initiatives
- Improve ease of doing business by addressing regulatory constraints

**KEY OUTCOMES BY 2020**

- Quality, safety and professionalism ingrained in industry culture
- More than 50% public projects exceed acceptable QLASSIC 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

**CASE FOR CHANGE**

- Lack of sustainability-rated construction; Buildings and infrastructure are not always resilient to natural calamities
- High carbon emissions and energy usage of buildings
- High volume of construction and demolition waste dumping

**INITIATIVES**

- Drive innovation in sustainable construction
- Reduce irresponsible waste during construction
- Facilitate industry adoption of sustainable practices
- Drive compliance to environmental sustainability ratings and requirements
- Focus on public projects to lead the charge on sustainable practices

**KEY OUTCOMES BY 2020**

- Malaysia’s sustainable infrastructure: a model for the emerging world
- 100% of large infrastructure projects exceed sustainability requirements
- 4 Mt CO₂ equivalent reduction per year
Executive Summary

PRODUCTIVITY

CASE FOR CHANGE

| Largely low-skilled workforce and inadequate or mismatch in training and development | High proportion of subscale SMEs, including Bumiputra SMEs and entrepreneurs |
| Over-reliance on low-skilled foreign labour | Lack of data and information-driven decision-making |
| Limited adoption of modern practices, mechanisation and IBS | Limited adoption of information technology such as BIM |

INITIATIVES

| Continue investment in human capital development in construction | Accelerate adoption of IBS, mechanisation and modern practices |
| | Roll out technology advantage across project life-cycle |
| | Advance SME/Bumiputra capacity and capability-building |
| | Enhance availability of strategic information via National Construction Industry Information Centre (NCIIC) |
| | Enhance control and balance of workforce supply |

KEY OUTCOMES BY 2020

| More than doubling productivity, matched by higher wages |
| 2.5x increase in productivity to US$16,500 per worker |

INTERNATIONALISATION

CASE FOR CHANGE

| Increasingly competitive domestic market, especially with the presence of foreign players |
| Limited access to enablers to support international expansion, including financing |
| Limited number of Malaysian players participate in construction projects abroad |

INITIATIVES

| Internationalise construction practices and standards |
| Support consortia formation and strengthen overseas market intelligence |
| Strengthen access to financing for Malaysian champions going abroad |

KEY OUTCOMES BY 2020

| Malaysian champions: leading the charge locally and globally |
| 10 companies achieve 5* SCORE rating |
| 50 Malaysian companies earn G8 status |
| 10 more construction-related companies export construction services in the global market |

Note: US$16,500 is equivalent to RM 61,939 as stated in the 11th Malaysia Plan; 2.5x increase uses 2011 as a base as compared to 11th Malaysia Plan where 1.6x increase in labour productivity uses 2015 as a base. Both sets of numbers are consistent.
“Our construction industry has enjoyed healthy growth rates and has made good progress on several fronts. However, the fact remains that there are a number of pressing issues that need to be urgently addressed. There is especially a need to address quality, safety and professionalism such that it can eventually be ingrained as part of the industry culture at all levels. Industry capabilities need to be developed in the area of sustainable construction in order for us to construct buildings, infrastructure and cities that are more environmentally responsible and resilient. Industry productivity needs to be significantly uplifted, with a higher proportion of our workforce being equipped with better technology, skills, competencies and expertise that will allow them to earn commensurately higher incomes. Internationalisation also needs to be a focus so that industry champions can be enabled to effectively compete locally and globally to generate greater economic activities and opportunities.

The Construction Industry Transformation Programme or CITP is introduced with the above in mind. For CITP to be successful, it must be positioned as a national agenda. Hence, extensive discussions at industry and national platforms have taken place and I am pleased to share that the CITP is recognised as an important focus and strategy under the 11th Malaysia Plan (RMK11). It is now up to all stakeholders – from government ministries and regulators to industry players, professional bodies and academia – to come together, collaborate and make a difference in this transformation. In tandem, CIDB will also play our part. We are embarking on an internal organisation transformation to support the implementation of CITP.

Together, we can and will transform the industry, contribute to the economy and help ensure the overall wellbeing of the nation.”

Dato’ Sri Ir. Dr. Judin Abdul Karim / Chief Executive / CIDB Malaysia
Stakeholder Benefits

As an engine of economic growth, a thriving construction industry at its full potential will deliver significant benefits to all stakeholders including the government, workforce and industry players across the value chain, consumers and the general public.

**BENEFITS TO INDUSTRY PLAYERS, INCLUDING SMES**

Large construction players stand to benefit significantly from a robust construction industry with improved productivity and higher usage of technology and modern practices. CITP encourages adoption of productivity-enhancing construction IT such as BIM, which will produce a step-change in the way the industry goes about the design and construction of buildings and infrastructure. Adoption of advanced technologies will be achieved through regulations, the introduction of guidelines (for example, for BIM adoption at various stages), the provision of adequate high-quality training to ensure the workforce is equipped with the skills necessary to adopt technology in a meaningful way. In addition, a highly skilled workforce committed to superior work will positively impact the efficiency and quality of the projects while ensuring cost efficiency and a safer, better working environment. Overall, increased productivity will lead to more cost-efficient and faster delivery of construction projects in the longer term, which will be translated into higher earnings.

Construction is a highly competitive industry and Malaysian companies with high capability and expertise can leverage these attributes to capitalise on significant business opportunities abroad. International construction opportunities are significant – investment in global infrastructure is set to rise from USD 2.6 trillion to USD 4.5 trillion by 2030. The FTAs that Malaysia has signed and will sign can open up the opportunity for globally competitive Malaysian construction companies to effectively participate in a significantly larger market beyond domestic shores. Improved safety conditions for workers will reduce hours and money lost on accident time-off and improves the overall productivity as well as the reputation of the industry. The adoption of environmentally sustainable practices will allow players to construct buildings which are more energy-efficient and have lower lifetime cost. The removal of regulatory obstacles will further improve the ease with which transactions are carried out in the industry and reduce the high cost of resolving regulatory disputes.
A booming construction industry will also spur the growth of the SME sector in Malaysia. Improved access to technology, including the use of BIM and customised training programmes that will develop specialised skills in niche areas, will significantly increase the competitiveness of SMEs. More comprehensive training, especially at the managerial and supervisory level, will benefit SMEs with limited experience and opportunities to build up capabilities of their personnel in these positions. This will positively impact the scale and capability of SMEs and drive integration across the value chain.

High-performing small and medium enterprises (SMEs) will be able to form strategic partnerships with multi-national companies (MNCs) and Government-linked Companies (GLCs) to gain access to domestic and international markets, thus enabling them to improve their competitiveness. These synergistic relationships will further drive the technology and capability transfer between the MNCs/GLCs and the participating SMEs.

With a strong and viable construction industry, players can expect better access to financing to facilitate their investments into technology and employing higher-skilled personnel. Ultimately, the SME ecosystem will have the support to scale up, build capability and adopt new technology. Economic mechanisms such as taxation and BIM software licensing support will reduce the burdens faced by SMEs to invest in more sophisticated productivity-boosting technology and practices that will then be rewarded with higher earnings.

**BENEFITS TO THE WORKFORCE**

As the construction industry continues to progress, the job mix is expected to shift to having more managers, professionals and skilled workers. For example, in Australia skilled workers make up around 30 per cent of the construction workforce. This indicates that the workforce has the potential to up-skill and this will naturally correspond with an increase in income levels, as a reward for the higher skill-mix within the industry. Wages of skilled workers in the Malaysian construction industry are five times that of operative workers. This will, in turn, boost their spending power on other sectors of the economy. At the same time, the total cost of labour in this industry could potentially decrease with decreasing man-hours from greater technology adoption and increases in labour productivity. Beyond productivity, workers on construction sites will also benefit from higher standards of living conditions recommended by the CITP. A minimum standard for workers’ amenities will be introduced via regulations. Greater enforcement of on-site safety practices will also lead to fewer accidents for workers. The removal of regulatory obstacles will further improve the ease with which transactions are carried out in the industry.

**BENEFITS TO THE PUBLIC SECTOR AND OVERALL ECONOMY**

A transformed construction industry will enable the government to strengthen its fiscal position by both enhancing revenue and reducing expenditure. A thriving construction industry will have productive players who can contribute to the overall revenue pool of the nation. Moreover, a more efficient industry will drive cost savings. The adoption of various construction technologies that promote standardisation can lower upfront procurement costs while higher quality construction will reduce expenditure directed towards re-work, maintenance, renovations and repairs. At the same time, a more resource-efficient approach to construction will drive further savings.
As clients and end-consumers of the construction industry, the government will benefit from the implementation of CITP in many ways. Implementation of the Quality, Safety and Professionalism initiatives will enable the government and the *rakyat* to purchase, live, and work in a built environment that is of a higher quality in terms of materials and workmanship, and one that does not compromise on safety. Further, a more professional construction industry will mean removing regulatory obstacles and encouraging greater investment into the economy. Initiatives in Environmental Sustainability will deliver buildings and infrastructures constructed with stringent sustainability requirements that are more energy-efficient, more responsible in their emissions of carbon and more resilient to natural calamities, all aiding to reduce the lifetime cost of the buildings and infrastructures. CITP’s Productivity initiatives will deliver modern practices aimed at attracting more locals into the industry at higher wages and contribute to the government’s agenda to develop into a high income economy. The Internationalisation initiatives will help Malaysian players compete more effectively in the domestic market and abroad, potentially raising export earnings. The multiplier effect then distributes this additional wealth across other industries and the country.

With CITP, investments will be required up-front to ensure that the effective level of quality, safety, professionalism and environmental sustainability are built early into any construction project cost. Referring to Figure 1, the often quoted cost ratio of “0.1:1:5:200” in the “Design : Construction : Maintenance : Operations” reflects the true value of investing in well-designed construction that far outweighs the project costs. For example, for every RM 0.1 Million invested in the design of a building, typically the construction cost will be 10 times that, and the maintenance cost will be 5 times the construction cost, and the operations costs (e.g., staff costs) will be 200 times the maintenance cost. The operations of the building will be the value-generating end of the lifecycle of a building. In other words, the more we invest in the early stages of a construction project, the higher the value created will be for the end-product. Project owners and end-users can capture the most benefit by making the right up-front investments. Thus, investments in higher standards and improved, modern practices in design and construction encouraged by CITP will result in tremendous value for not just the construction industry, but all key stakeholders and the country.

The operations of the building will be the value-generating end of the lifecycle of a building. In other words, the more we invest in the early stages of a construction project, the higher the value created will be for the end-product.
Figure 1 The value of outcomes for project owners and end users far outweighs the project costs.

01
CONTEXT OF THE MALAYSIAN CONSTRUCTION INDUSTRY
Significance of the Construction Industry

The Malaysian construction industry is a key economic engine for the overall economy. It forms a significant component of Malaysia’s Gross Domestic Product (GDP), standing at ~4 per cent in 2013\(^7\) and is expected to contribute 5.5 per cent to GDP by 2020\(^8\). It is expected to grow at 10.3 per cent\(^9\) per year, outpacing Malaysia’s overall economy which is expected to grow at a steady rate of 5-6 per cent per year.\(^{10}\) The industry demonstrates strong correlation with economic development, with the construction share of GDP positively correlated with GDP per capita.

---

7. Bank Negara Malaysia, 2014
8. 11th Malaysia Plan
9. 11th Malaysia Plan
10. 11th Malaysia Plan
Beyond this, the construction industry generates many positive externalities as it operates with an estimated two-times multiplier effect. More than 120 industries rely on the construction industry, demonstrating the fact that the industry has strong forward and backward linkages, ahead of many other industries in Malaysia.

Given its size, the industry is a large consumer of both goods and services. For example, the construction industry consumes a significant proportion of Malaysia’s manufacturing sector, including significant quantities of basic metals, ceramics, cement and other building materials. The construction industry is also a large consumer of higher value-added equipment and machinery. Beyond being a buyer of manufactured goods, the construction industry is also a key consumer of a range of services. These include knowledge-driven consultancy and engineering, as well as a broad base of financial services. With this, the industry accounts for five per cent of total output from the Malaysian services sector.

In addition, the construction industry also presents significant employment opportunities. It is Malaysia’s fourth largest employer, employing approximately 1.2 million registered workers, representing 9.5 per cent of the total national workforce (see Figure 2). 75 per cent of registered employees in the construction industry are Malaysians. See Figure 3 for the composition of workforce by worker type. Additionally, thousands of students pursue construction-related courses at universities, academies and technical and vocational institutes nationwide.

---

12. Input-Output Table 2005; Latest available data
13. Department of Statistics, Malaysia, 2013; Latest available data
“In the Eleventh Plan, focus will not only be on expanding the physical capacity and reach of infrastructure networks, but improving their performance, productivity and affordability. The aim is to not only bring such amenities to all households, urban or rural, but make these services befitting of an advanced economy and inclusive nation by 2020.”

11th Malaysia Plan / Chapter 7 / Strengthening infrastructure to support economic expansion

At the same time, Malaysia’s construction industry plays a pivotal role in supporting the development of SMEs in the country. 90 per cent of the firms in the construction industry are SMEs (see Figure 4)\(^\text{15}\). The industry has a large ecosystem of Bumiputera companies, which constitute 56 per cent of the contractor base and 35 per cent of IBS manufacturers respectively\(^\text{16}\).

Moving forward, many ongoing and planned national-level infrastructure projects will further boost the construction industry. The Eleventh Malaysia Plan (RMK11) is targeting a 40 per cent public transport modal share in the Greater Kuala Lumpur/Klang Valley region and 20 per cent in other state capitals. RMK11 also targets continued urbanisation in Greater Kuala Lumpur/Klang Valley, Georgetown, Johor Bahru, Kuching, Kuantan and Kota Kinabalu. The logistics industry will also be strengthened, with a target growth rate of 8.5 per cent annually in the transport and storage subsector\(^\text{18}\).

\(^{15}\) 2013 definition of SMEs (firms with <50 employees); Pending latest compilation of statistics by Department of Statistics to reflect the 2014 definition of SMEs
\(^{16}\) CIDB Statistics 2014
\(^{17}\) Department of Statistics, Malaysia; 2012
\(^{18}\) 11th Malaysia Plan

---

**Figure 4 Number of firms in construction by employee count (2012)**\(^\text{17}\)

![Bar chart showing the distribution of firms by employee count in 2012.](image-url)
BACKGROUND OF THE MALAYSIAN CONSTRUCTION INDUSTRY

Construction Volume by Public and Private Sectors\(^{19}\)
There were 34,172 projects valued at RM 407 Billion for the 2006-2010 (9th Malaysia Plan) period, compared to 30,717 projects valued at RM 507 Billion for the 2011-2014 period\(^{20}\). These figures reflect an average of ~6,800 projects per year during the 9th Malaysia Plan period and ~7,700 projects per year during 2011-2014. A double digit growth rate in the number of projects of about 13 per cent per annum was thus observed between 2010 and 2014.

Type and Scale of Projects\(^{21}\)
Construction projects can be divided into four (4) main categories, as defined by CIDB:

- **Social Amenities**
  - refers to building projects linked to social services such as education, public facilities, sports and recreation, clubs, welfare and the community

- **Infrastructure**
  - refers to projects linked to utility, transportation, drainage and sewerage, and natural disaster resilience such as roads, bridges, water supply, sewers, electrical grids and telecommunications

- **Residential**
  - refers to housing projects (including apartments or condominiums), hostels, and the likes

- **Non-Residential**
  - refers to office buildings, shopping centres, industrial buildings, hotels, agriculture, manufacturing and landscaping works

An analysis of the type and scale of construction projects undertaken over the years indicate a changing pattern (see Figure 5 and Figure 6). This is expected as construction will vary according to economic growth and consumer spending patterns. To illustrate, the value of construction projects in the non-residential category grew from RM 37 Billion in 2011 to RM 70 Billion in 2014, making the non-residential category the largest category in the industry by project value.

Projects Awarded to Local and Foreign Contractors
The vast majority of construction projects have been awarded to local firms (see Figure 8) with up to ~85 per cent of projects, by project value, awarded to local contractors in the period 2010-2014.

In 2013, local contractors secured 88 per cent or ~RM 116 Billion worth of projects. Meanwhile, foreign contractors secured 11 per cent or ~RM 15 Billion worth of projects. This represents 132 projects implemented by 72 contractors. In 2014, 82 foreign contractors secured projects thereby, increasing the value of projects won to ~RM 33 Billion, representing 156 projects\(^{22}\).

Furthermore, foreign contractors who typically secure private sector projects (96 per cent by project value in the period 2010-2014), began securing a larger share of government-led projects in 2014, with ~RM 2 Billion worth of projects won compared to none in 2013.

---

19. CIDB Statistics, 2001-2014
20. Portion of Tenth Malaysia Plan period
22. CIDB Statistics, 2015, as of March 2015
Context of the Malaysian Construction Industry

Figure 5 Project values by category (2001-2014)\textsuperscript{23}

<table>
<thead>
<tr>
<th>Year</th>
<th>Social Amenities</th>
<th>Infrastructure</th>
<th>Residential</th>
<th>Non Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2005</td>
<td>51</td>
<td>12</td>
<td>61</td>
<td>19</td>
</tr>
<tr>
<td>2006</td>
<td>17</td>
<td>17</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>2007</td>
<td>14</td>
<td>17</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td>2008</td>
<td>14</td>
<td>17</td>
<td>21</td>
<td>25</td>
</tr>
<tr>
<td>2009</td>
<td>15</td>
<td>23</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>2010</td>
<td>27</td>
<td>33</td>
<td>14</td>
<td>32</td>
</tr>
<tr>
<td>2011</td>
<td>91</td>
<td>102</td>
<td>7</td>
<td>37</td>
</tr>
<tr>
<td>2012</td>
<td>46</td>
<td>34</td>
<td>38</td>
<td>37</td>
</tr>
<tr>
<td>2013</td>
<td>31</td>
<td>38</td>
<td>52</td>
<td>41</td>
</tr>
<tr>
<td>2014</td>
<td>7</td>
<td>46</td>
<td>32</td>
<td>70</td>
</tr>
</tbody>
</table>

Value of Projects Awarded (RM Billion)

Figure 6 Number of projects awarded by category (2001-2014)\textsuperscript{24}

<table>
<thead>
<tr>
<th>Year</th>
<th>Social Amenities</th>
<th>Infrastructure</th>
<th>Residential</th>
<th>Non Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2005</td>
<td>5,142</td>
<td>1,381</td>
<td>6,522</td>
<td>7,039</td>
</tr>
<tr>
<td>2006</td>
<td>1,308</td>
<td>1,794</td>
<td>1,519</td>
<td>1,743</td>
</tr>
<tr>
<td>2007</td>
<td>1,624</td>
<td>1,865</td>
<td>1,486</td>
<td>1,701</td>
</tr>
<tr>
<td>2008</td>
<td>1,373</td>
<td>2,345</td>
<td>2,199</td>
<td>2,090</td>
</tr>
<tr>
<td>2009</td>
<td>1,505</td>
<td>1,505</td>
<td>1,751</td>
<td>2,131</td>
</tr>
<tr>
<td>2010</td>
<td>1,751</td>
<td>1,950</td>
<td>1,863</td>
<td>2,276</td>
</tr>
<tr>
<td>2011</td>
<td>7,302</td>
<td>859</td>
<td>7,605</td>
<td>7,892</td>
</tr>
<tr>
<td>2012</td>
<td>1,863</td>
<td>1,994</td>
<td>1,800</td>
<td>1,800</td>
</tr>
<tr>
<td>2013</td>
<td>7,892</td>
<td>906</td>
<td>8,040</td>
<td>8,040</td>
</tr>
<tr>
<td>2014</td>
<td>7,180</td>
<td>640</td>
<td>7,180</td>
<td>7,180</td>
</tr>
</tbody>
</table>

Number of Projects Awarded

23. CIDB Statistics, 2001-2014; as of March 2015
24. CIDB Statistics, 2001-2014; as of March 2015
**Figure 7** Value of projects awarded, local vs. foreign (2001-2014)

![Bar chart showing the value of projects awarded to local and foreign contractors from 2001 to 2014. The chart compares the average value of projects awarded in the years 2001-2005 and from 2006 to 2014. The chart indicates a trend of increasing value of projects awarded to foreign contractors over the years.]

**Figure 8** Value of projects awarded to foreign contractors, government projects vs. private projects (2010-2014)

![Bar chart showing the value of projects awarded to foreign contractors in government and private projects from 2010 to 2014. The chart indicates a significant increase in the value of projects awarded to foreign contractors in private projects from 2010 to 2014.]

---

25. CIDB Statistics, 2001-2014; as of March 2015; Total values may not add up due to rounding
26. CIDB Statistics, 2010-2014; as of March 2015
02

ASPIRATION AND OUTCOMES
The importance and significance of the construction industry has been clearly established in the preceding chapter. The time has now come to cast a vision and strategy for reaching where it needs to be in the future.

Therefore, under the auspices of the Ministry of Works (MOW), the Construction Industry Transformation Programme (CITP) has been developed in close collaboration with industry players. The CITP builds on existing initiatives and is poised to drive the industry toward an era of further progress and growth between 2016 and 2020.

The CITP recognises that while significant progress has been made in the industry over the last few decades, the industry still faces real and substantial challenges that need to be addressed. Four strategic thrusts have been identified to guide the continued development of the construction industry: Quality, Safety and Professionalism, Environmental Sustainability, Productivity and Internationalisation.

The CITP envisions the construction industry to become an advanced, highly productive industry able to sustain continued growth and nurture international champions. The industry will be characterised as professional and highly sophisticated. Architects, engineers, designers, and contractors will have the capacity to construct sophisticated, sustainable infrastructure, buildings and cities via sustainable practices. Further, the construction workforce will be highly capable and there will be high local participation in the industry, with a shift towards high-skilled jobs. The industry will be at the forefront of construction technology, thereby driving high quality and productive construction.

Construction players will be highly competitive against global players in the domestic market and will increasingly win international projects. The CITP will achieve this aspiration through solid strategies and action plans across the four strategic thrusts.

In order to realise this aspiration and to successfully meet its outcomes, a robust, enabling foundation must be in place.

- Firstly, there must be strong industry collaboration. All relevant private and public sector stakeholders – ministries, agencies, professional boards and associations, construction players, universities and training institutes, and industry experts – must be committed towards implementing the CITP;

- Secondly, a strong coordinating body, or Programme Management Office (PMO), should be in place to coordinate the overall implementation of the CITP;

- Finally, the CITP will only be successful if there is a robust governance structure and mechanism in place. The governance mechanism must seek to resolve roadblocks at every step possible, with clear mechanisms for escalation and resolution until issues can be promptly and effectively closed.
Outcomes

The CITP has clear key outcomes across each of the four strategic thrusts (see Figure 9). Firstly, the CITP aims to deliver an industry culture that is ingrained with quality, safety and professionalism. Secondly, Malaysia will be seen as a model for the emerging world in terms of sustainable infrastructure. Thirdly, the construction industry will more than double its productivity, and the increase in productivity will be matched by higher wages. Finally, Malaysian construction industry champions will be nurtured, and they will lead the charge both locally and globally.
Figure 9 Outcomes by strategic thrusts

**QUALITY, SAFETY & PROFESSIONALISM**
- Quality, safety and professionalism ingrained in industry culture
- More than 50% public projects exceed acceptable QLASSIC 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**
- Malaysia’s sustainable infrastructure: a model for the emerging world
- 100% of large infrastructure projects exceed sustainability requirements
- 4 Mt CO$_2$ equivalent reduction per year

**PRODUCTIVITY**
- More than doubling productivity, matched by higher wages
- 2.5x increase in productivity to US$16,500 per worker$^{1}$

**INTERNATIONALISATION**
- Malaysian champions: leading the charge locally and globally
- 10 companies achieve 5* SCORE rating
- 50 Malaysian companies earn G8 status
- 10 more construction-related companies export construction services in the global market

---

1. US$16,500 is equivalent to RM 61,939 as stated in the 11th Malaysia Plan; 2.5x increase uses 2011 as a base whereas 11th Malaysia Plan states 1.6x increase in labour productivity using 2015 as a base, thus they are consistent
Alignment with National Agenda

The Government, through various programmes, has commenced a coordinated strategy to transform Malaysian policies. Among these programmes include the recently launched RMK11 and the Services Sector Blueprint.

The CITP has been carefully formulated to contribute to and align with these national transformation strategies, to ensure continuity and consistency with the national agenda.

THE ELEVENTH MALAYSIA PLAN, 2016-2020

The RMK11 focuses on the following six strategic thrusts:

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

CITP’s implementation is expected to directly contribute to aspects across all six RMK11 thrusts. Chapter 8 of RMK11 and Focus area D directly aligns with the CITP. Several CITP initiatives also contribute to strategies within RMK11 Chapter 9: Transforming public service for productivity.

The CITP’s recommendations to enhance the Bumiputera community’s competitiveness in economic activities, to ensure quality and safe living spaces, to address the mismatch of supply and demand in the labour market, to develop a highly skilled workforce, to increase productivity and competitiveness are highly aligned with, and will contribute to the delivery of the RMK11.

THE SERVICES SECTOR BLUEPRINT

The Government has launched the Services Sector Blueprint to support Malaysia’s drive towards becoming a high-income, advanced nation. Through this Blueprint, the services sector will continue to be the main source of growth, output and employment. The Blueprint calls for realignment of building blocks and facilitation of structural adjustment that is needed for the sector to move up the value chain.

As a core component of the services sector, the construction industry is also poised to contribute to the reform of the services sector, through increased efforts in human capital development, internationalisation and regulatory reform. The CITP is therefore aligned with policy levers in the Services Sector Blueprint, such as Internationalisation, Human Capital Development, and Sectoral Governance Reform. Overall, the CITP is crafted to meet the national agenda and builds upon this Blueprint to ensure consistency across the entire services sector.
03

APPRAOH
The development of CITP took more than a year, through an extensive, collaborative and consultative process.

The CITP received inputs from over 150 stakeholder groups, including from ministries and government agencies, industry players, professional boards and associations, universities and training institutes, industry experts as well as other stakeholders in the construction industry during the drafting and design phase. This number is expected to increase as the CITP moves to implementation.

There were two key phases in the development of the CITP, as well as an interim period where the transformation programme was “stress-tested” with various stakeholders (see Figure 10):

**PHASE 1**
Baseline and Plan Development
March - June 2014

- Key issues in the industry understood
- Gaps in Malaysia as compared to best practices and benchmarks identified
- Strategic thrusts identified
- Draft plan produced

**PHASE 2**
Developing detailed implementation plan
Jan - July 2015

- Series of lab sessions and one-on-one engagements
- Roles and responsibilities of stakeholders defined
- Timeline of activities estimated
- Required resourcing further refined according to stakeholder input
- Detailed implementation plan ready for launch

**“Stress Test”**
July - Dec 2014

- Draft plan syndicated together with stakeholders reaching more than 150 groups
- Focus group discussions, one-on-one engagements
- Feedback and input incorporated
- Initiatives, implementation milestones, and programme refined
- Governance and estimated required resources detailed out

*Figure 10 Development stages of CITP*
Phase 1 of the CITP development included a baseline of the industry to understand key issues in the sector, to identify gaps when compared to benchmarks or best practices, to identify strategic thrusts to drive the industry transformation, and to commence planning for implementation.

Three core lenses were used to determine the overall strategic thrusts of the CITP:

### 1. Inputs from Key Stakeholders

Issues faced by the industry were discussed and collated through extensive industry and government dialogue. These dialogues were held through one-on-one interviews, focus group discussions and lab sessions. Many of the concerns raised by stakeholders centred on ensuring that the right ‘foundation’ for future growth of the industry is in place. Through this process, the shared development of the CITP began.

<table>
<thead>
<tr>
<th>70+</th>
<th>50+</th>
</tr>
</thead>
<tbody>
<tr>
<td>private sector, including construction industry players</td>
<td>government agencies &amp; ministries</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15+</th>
<th>2</th>
<th>15+</th>
</tr>
</thead>
<tbody>
<tr>
<td>learning institutions</td>
<td>regulatory bodies</td>
<td>professional boards &amp; associations</td>
</tr>
</tbody>
</table>
2. **Lessons from Global Trends and Benchmarks**

The development of the CITP strategic thrusts took into consideration the implications of key global megatrends to the Malaysian construction industry. Global megatrends are forward-looking, macroeconomic trends that are expected to change how industries and organisations approach business in the future. In line with this, a list of global megatrends was developed and prioritised to identify the most relevant and important trends for the Malaysian construction industry. These megatrends, and its impact to the Malaysian construction industry, are detailed out in Figure 11.

An examination of global megatrends in urbanisation, energy scarcity and sustainability, globalisation and the rise of rapidly-developing economies (RDEs), and productivity and innovation, indicate that Malaysia must be prepared for changes in both the demand and supply of construction services.

In addition, the development of strategic thrusts and initiatives were also guided by extensive and comprehensive benchmark studies, conducted across various topics related to the construction sector. Among countries examined as yardsticks include the United States of America, the United Kingdom, Singapore, Turkey and South Korea.

![Figure 11 Impact of megatrends on the Malaysian construction industry](image-url)

**Figure 11 Impact of megatrends on the Malaysian construction industry**

**IMPACT ON MALAYSIA’S CONSTRUCTION INDUSTRY**

<table>
<thead>
<tr>
<th>Urbanisation</th>
<th>Energy scarcity and sustainability</th>
<th>Globalisation and the rise of RDEs</th>
<th>Productivity and innovation imperative</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Urbanisation</strong> in GKV, Georgetown, Johor Bahru, Kuantan, Kuching, and Kota Kinabalu result in increasing demand for residential buildings, commercial properties &amp; infrastructure.</td>
<td><strong>Malaysia is on the path towards sustainability, ongoing reduction of energy subsidies</strong> (electricity, fuel). Sustainability is increasingly a core requirement in foreign markets, e.g., EU and US, and tablestakes for Malaysian companies to compete internationally.</td>
<td>More holistic trade agreements such as the Trans-Pacific Partnership Agreement (TPPA) entering into force, Malaysian players must <strong>increase productivity</strong> to compete.</td>
<td>Gains in construction productivity is primarily achieved through adoption of relevant technology e.g., IBS technology / pre-fabrication, Value Management methodology in project planning.</td>
</tr>
</tbody>
</table>

**Growing Malaysian middle class** increasingly environmentally conscious.

**Changing market demands**
- Increasing demand for infrastructure and buildings
- Malaysian consumers’ preferences increasingly “green”

**Changing supply side factors**
- Increasing competition from international players, both domestic and abroad
- Growing pressure to adopt construction technology
An examination of global megatrends indicate that Malaysia must be prepared for changes in both the demand and supply of construction services.

3. **Alignment with Malaysia’s National Agenda**

The CITP has been prepared in alignment with RMK11. In addition, several initiatives under the CITP are congruent with policy initiatives as detailed out in key government documents such as the Services Sector Blueprint.

Once a draft plan of the CITP was prepared, it was “stress-tested” together with 150 stakeholder groups from ministries, agencies, boards, associations, industry experts, and others in the construction ecosystem. For each of the four broad strategic thrusts that were identified, outcomes to be achieved were articulated. 18 focused and streamlined initiatives were identified to transform Malaysia’s construction industry.

*Figure 12 Approach to developing CITP initiatives*

<table>
<thead>
<tr>
<th>STRATEGIC THRUSTS</th>
<th>OVERALL OUTCOMES</th>
<th>CRITICAL INITIATIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic thrusts</strong> to align top-down priorities and bottom-up inputs identified</td>
<td><strong>For each thrust, the outcome to be achieved through CITP was then defined</strong></td>
<td><strong>Eventually, 18 must-do initiatives to be implemented prioritised</strong></td>
</tr>
</tbody>
</table>
Extensive discussions were held with key stakeholder groups to incorporate input, feedback, and ensure support. During this process, the CITP became a ‘shared’ journey as stakeholder collaborations became central in co-developing the way forward for the industry.

Once the implementation milestones for the initiatives were determined, the governance and funding requirements were detailed out.

**Figure 13** Engagement methods to incorporate feedback and inputs from stakeholders

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Mode of Engagement</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| Across all types of industry stakeholders including:  
• Industry players  
• Subject matter experts  
• Regulators | 1-on-1 interviews  
  Focus Groups  
  Expert interviews | Incorporate across-the-board feedback and input from key stakeholders (incl. ministries, agencies, industry players, boards and associations, etc.) |
| Internal stakeholder syndication and sign-off to demonstrate commitment to CITP implementation | Internal workshops  
  1-on-1 discussions  
  Lab sessions | Ensure alignment and agreement to jointly deliver on CITP |
| Selected stakeholders whose buy-in is critical to CITP execution | 1-on-1 discussions  
  Lab sessions  
  Surveys | Share and validate with relevant parties (e.g., Ministries, government agencies, professional associations, industry players, universities, etc.) on timelines, budget and other specifics |
In Phase 2, the 18 initiatives identified were further discussed and detailed out with relevant stakeholders through a series of lab sessions and one-on-one engagements (see Figure 13). The stakeholders involved included government ministries and agencies, industry players, professional boards and associations, universities and research organisations. The lab sessions had three objectives: to discuss the roles and responsibilities of each stakeholder, to agree on the timelines required for supporting activities, and to estimate the required resourcing for implementation. In addition to the lab sessions, one-on-one engagements were also held with key stakeholder groups across the construction value chain from both the public and private sectors, to ensure alignment and strong support for the implementation of the CITP.

Based on input from the lab sessions and engagements with multiple stakeholder groups, a detailed implementation plan has been developed to guide the execution of the CITP. This detailed implementation plan included a “deep dive” of each of the CITP initiatives. For each initiative, a comprehensive implementation charter detailing out key milestones, stakeholders involved, critical interdependencies, key performance indicators (KPIs), and resources required, has been defined and will be used for tracking and monitoring purposes going forward (see Figure 14).

Over the next two sections, this document will discuss the issues and recommendations for each of the four strategic thrusts under the CITP, followed by further detail on the governance structure.

*Figure 14* Charters have been developed, detailing the implementation activities, stakeholder roles, interdependencies, KPIs and required resources for each initiative from 2016-2020.

**KEY ELEMENTS OF THE IMPLEMENTATION PLAN DEVELOPED FOR EACH INITIATIVE**

- **Activities**: Implementation steps and milestones to complete initiative
- **Stakeholders involved**: Champion agency, supporting agency and working group required
- **Inter-dependencies**: Other CITP initiatives or external on-going initiatives linked to this initiative
- **KPIs**: Operation and outcome driven performance indicators
- **Financial resources**: Cost to implement initiative
### Approach

#### 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

#### 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**: 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 National Construction Industry Information Centre (NCIIC)
- **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

---

**Figure 15 18 CITP initiatives across 4 Strategic Thrusts**

Note: Several initiatives may belong to more than one strategic thrust. In such instances, these initiatives have been placed under the strategic thrust where it is expected to have the highest impact.

28. Initiative Q4 contributes to and cuts across all four thrusts of CITP, but primarily contributes to the Professionalism aspect of the Quality, Safety and Professionalism thrust.
The CITP received inputs from over 150 stakeholder groups, including from ministries and government agencies, industry players, professional boards and associations, universities and training institutes, industry experts as well as other stakeholders in the construction industry during the drafting and design phase. This number is expected to increase as the CITP moves to implementation.
FOUR STRATEGIC THRUSTS
The first strategic thrust, Quality, Safety and Professionalism will ingrain quality, safety and professionalism into the culture of the construction industry.

The thrust aims to halve worksite fatalities and injuries by introducing a minimum standard for workers’ amenities and increasing on-site safety enforcement. The thrust will increase the implementation of quality assurance and quality control assessments, and double the number of public projects that meet a minimum quality rating. It will also improve Malaysia’s Ease of Doing Business ranking by five percentage points by addressing regulatory obstacles.

The second strategic thrust, on Environmental Sustainability, will develop Malaysia’s infrastructure to a sustainable standard.

Malaysia aims to be a model for the emerging world. The thrust will ensure that all large infrastructure projects exceed sustainability requirements. The thrust will also support the nation’s goal to reduce carbon emissions, by reducing the industry’s carbon emissions by 4 Mt CO₂ per year.
The third thrust, on Productivity, aims to double the industry’s productivity, matched by higher wages.

This will be possible through enhanced human capital development, adoption of technology and mechanisation, and modernisation of construction processes.

Finally, the Internationalisation thrust will grow Malaysian champions who will lead the charge locally and globally.

The thrust will develop more companies who will have high SCORE ratings and be able to earn G8\(^{29}\) status. This can be realised by addressing gaps in financing and adopting international practices and standards.

A total of 18 initiatives have been defined across the four strategic thrusts. The issues identified and the recommendations that seek to address them are described further in this chapter.

\(^{29}\) New category of high performing construction players to be introduced and described in Initiative Q3
18 CITP INITIATIVES TO TRANSFORM THE CONSTRUCTION INDUSTRY

**QUALITY, SAFETY & PROFESSIONALISM**

- **Q1** Increase emphasis on quality and implement quality assessments
- **Q2** Improve workplace safety and workers’ amenities
  - **Q2a**: Regulate minimum level of construction workers’ amenities
  - **Q2b**: Improve level of occupational safety and health at construction site
- **Q3** Improve ease of doing business by addressing regulatory constraints
  - **Q3a**: Streamline and enhance contractor registration
  - **Q3b**: Strengthen One-Stop-Centre for all construction permits/approvals
  - **Q3c**: Consider set up of tribunal for construction permit dispute resolution
  - **Q3d**: Enhance culture and practices by learning from decided construction cases
- **Q4** Promote and raise awareness of CITP initiatives

**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** Facilitate industry adoption of sustainable practices
- **E5** Reduce irresponsible waste during construction
### PRODUCTIVITY

<table>
<thead>
<tr>
<th>P1</th>
<th>Continue investment in human capital development in construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1a</td>
<td>Streamline construction-related training programmes in Malaysia</td>
</tr>
<tr>
<td>P1b</td>
<td>Strengthen reach, effectiveness and comprehensiveness of training</td>
</tr>
<tr>
<td>P2</td>
<td>Enhance control and balance of workforce supply</td>
</tr>
<tr>
<td>P2a</td>
<td>Implement regular industry manpower planning</td>
</tr>
<tr>
<td>P2b</td>
<td>Introduce mechanisms to raise skills mix for intake of foreign workers</td>
</tr>
<tr>
<td>P3</td>
<td>Accelerate adoption of IBS, mechanisation and modern practices</td>
</tr>
<tr>
<td>P3a</td>
<td>Drive scale of IBS adoption via public sector projects</td>
</tr>
<tr>
<td>P3b</td>
<td>Propel IBS supply chain via economic mechanisms</td>
</tr>
<tr>
<td>P4</td>
<td>Roll out technology advantage across project life-cycle</td>
</tr>
<tr>
<td>P4a</td>
<td>Facilitate BIM adoption in construction industry via regulation</td>
</tr>
<tr>
<td>P4b</td>
<td>Establish reference centre to support the development and adoption of BIM and modern methods</td>
</tr>
<tr>
<td>P4c</td>
<td>Implement competency and learning management system</td>
</tr>
<tr>
<td>P5</td>
<td>Enhance availability of strategic information via National Construction Industry Information Centre (NCIIC)</td>
</tr>
<tr>
<td>P4a</td>
<td>Enhance price and cost information on industry resources</td>
</tr>
<tr>
<td>P4b</td>
<td>Enhance awareness and certainty on upcoming construction demand</td>
</tr>
<tr>
<td>P4c</td>
<td>Integrate construction-related data into National Construction Industry Information Centre (NCIIC)</td>
</tr>
<tr>
<td>P6</td>
<td>Advance SME/Bumiputera capacity and capability-building</td>
</tr>
</tbody>
</table>

### INTERNATIONALISATION

<table>
<thead>
<tr>
<th>I1</th>
<th>Internationalise construction practices and standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1a</td>
<td>Introduce Malaysian Standard for construction specifications</td>
</tr>
<tr>
<td>I1b</td>
<td>Heighten enforcement of compliance to mandatory material standards</td>
</tr>
<tr>
<td>I1c</td>
<td>Enhance and expand adoption of MyCESMM (Malaysian Civil Engineering Standard Method of Measurement)</td>
</tr>
<tr>
<td>I2</td>
<td>Strengthen access to financing for Malaysian champions going abroad</td>
</tr>
<tr>
<td>I3</td>
<td>Support consortia formation and strengthen overseas market intelligence</td>
</tr>
<tr>
<td>I3a</td>
<td>Facilitate consortia formation to promote scale of Malaysian players</td>
</tr>
<tr>
<td>I3b</td>
<td>Ensure focused targeting of high potential export markets</td>
</tr>
</tbody>
</table>
CITP aims for quality, safety and professionalism to be ingrained in the culture of the industry. Key outcomes under this thrust by 2020 include more than 50 per cent of public projects exceed acceptable QLASSIC score, more than 50 per cent reduction in worksite fatalities and injuries, and an improvement by 5 percentage points in the World Bank’s Ease of Doing Business indicator for dealing with construction permits. Quality, safety and professionalism are important and they contribute to the inclusiveness goal under RMK11.

There is currently a wide spectrum of issues within quality, safety and professionalism in the construction industry, all of which have an impact on the performance of the construction value chain. Four key issues specifically, will be addressed within this Thrust:

- Lack of adequate emphasis on quality assessment and assurance
- Poor conditions on worksite, including workers’ amenities and safety and health standards
- Complex regulatory framework, processes and procedures, which lead to delays in permits and approvals
- Room to enhance public perception of the industry and awareness of initiatives to improve the image of the industry

To address these issues in quality, safety and professionalism, the CITP puts forward four core Initiatives:

- Initiative Q1: Increase emphasis on quality and implement quality assessments
- Initiative Q2: Improve workplace safety and workers’ amenities
- Initiative Q3: Improve ease of doing business by addressing regulatory constraints
- Initiative Q4: Promote and raise awareness of CITP initiatives
QUALITY, SAFETY & PROFESSIONALISM

OUTCOMES

Quality, safety and professionalism ingrained in industry culture

50%
More than 50% public projects exceed acceptable QLASSIC\(^1\) score

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

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

Quality, safety and professionalism contribute to the Inclusiveness goal under the 11th Malaysia Plan

A more quality-conscious and inclusive construction industry will ensure higher levels of quality in the built environment, reduce worksite accidents and remove regulatory constraints

CASE FOR CHANGE

Very few quality-rated buildings
Only ~3% of buildings currently adopt QLASSIC\(^1\)

High occupational deaths in construction\(^2\)

CONSTRUCTION : 69
Manufacturing: 58
Agriculture, Forestry, Logging & Fishing: 33
Transport, Storage & Communication: 8
Utility: 7
Wholesale & retail trade: 5
Minning and quarrying: 5

Delays in approval of construction permits
2014 World Bank Ease of Doing Business
74+ days to obtain a construction permit in Malaysia\(^3\)
26 days in Singapore

HIGHLIGHTED RECOMMENDATIONS\(^4\)

Improve workplace safety and raise level of workers' amenities
- Strengthen pool of qualified safety officers and inspectors
- Include construction industry within purview of Act 446 (Workers' minimum standard of housing and amenities Act, 1990)

Increase demand and supply of quality-rated buildings
Recommend rating as prerequisite for permit issuance (CCC\(^5\) or CPC\(^6\))

Accelerate issuance of permit approvals through digitisation of One-Stop-Centre
Establish e-submission and e-approval for all permits/approvals

Four Strategic Thrusts

Case for change

LACK OF ADEQUATE EMPHASIS ON QUALITY ASSESSMENT AND ASSURANCE

To develop a merit-based culture in the construction industry, it is important to ensure that the quality of contractors and construction works meet a minimum standard. To-date, some standards for materials and structures have been developed by SIRIM QAS and CIDB, which are in line with internationally-recognised standards such as British Standards (BS) and International Standards Organisation (ISO). However, there is room for further improvement. Today, the demand for quality workmanship in buildings and infrastructure from both clients and consumers is still limited. In addition to limited emphasis and demand for quality, clients and consumers rarely demand buildings to be quality-rated. This lack of demand results in a corresponding lack of supply of quality-rated buildings. An example of a quality assessment or rating for buildings is Quality Assessment System in Construction (QLASSIC), which assesses contractor workmanship, as well as broader quality assurance for construction of buildings. Statistics show that only ~3 per cent of buildings in Malaysia was assessed using QLASSIC in 2013. This number rose to 7 per cent in 2014. There is also a lack of accredited assessors for QLASSIC, and this contributes to the low levels of QLASSIC assessment in Malaysia. Beyond QLASSIC, which is a quality assessment only for buildings, there is also room to improve independent quality assurance and quality control (QA/QC) assessment in the construction industry. As a result, it is difficult for consumers to discern quality of construction and to distinguish industry players that offer higher quality standards.

POOR CONDITIONS ON WORKSITE, INCLUDING WORKERS’ AMENITIES AND SAFETY AND HEALTH STANDARDS

Safety and health is a key area of concern for the construction industry, as there have been multiple major accidents in recent years. These incidents contribute to negative public perceptions of the industry. Living conditions on construction sites, particularly for foreign workers, have often been cited as being cramped with low levels of cleanliness, and with limited amenities.

Figure 16 Number of fatalities by sector in Malaysia (2014)

30. CIDB Statistics 2015
31. Department of Safety and Health, Malaysia, 2014
Relative to other industries, the construction industry has a higher fatality rate. Amongst industries deemed dangerous, the construction industry recorded 72 occupational deaths, as compared to 45 deaths in manufacturing and 15 deaths in mining and quarrying. The poor health and safety record can be attributed to low enforcement efforts as well as a low level of safety awareness among construction workers. Limited numbers of certified safety individuals such as Safety and Health Officers (SHO), Site Safety Supervisors (SSS) and Occupational Safety and Health (OSH) inspectors limit the level of enforcement of safety in the industry. Furthermore, there has been an upward trend in fatalities in construction during the period 2011-2014, as shown in Figure 17.

Construction sites with poor housekeeping practices also pose a threat to the general public as the conditions are conducive for vector diseases such as dengue. Small pools of water are often found at construction sites, and these can lead to mosquito breeding and dengue outbreaks. Whilst dengue is an endemic disease, specific measures can be taken to reduce the risks of dengue outbreaks. More stringent checks and greater responsibility and awareness of health and safety aspects on sites needed to control the spread of dengue.

**COMPLEX REGULATORY FRAMEWORK, PROCESSES AND PROCEDURES, WHICH LEAD TO DELAYS IN PERMITS AND APPROVALS**

The regulatory frameworks that govern the construction industry in Malaysia are complex and can be difficult to navigate. This reduces the ease of doing business. In particular, the issuance of licenses and permits, and contractor registration requires significant time and cost. The hold-up in obtaining construction permits and necessary approvals stem from bureaucracy. In addition, regulations that are dated and may not accommodate modern practices or the adoption of new technologies can add further inefficiencies in the industry.

Unclear regulations also present a significant challenge. Interpretations of regulations can be inconsistent from case to case and from stakeholder to stakeholder. The limited clarity and the inconsistent interpretation and application of regulations in Malaysia’s construction industry result in
disputes every year. These disputes can be costly in terms of time, money and effort. An example of how regulations can be applied differently is the Town and Country Planning Act 1976. While the Act allows professionals such as architects and engineers to submit applications for planning permission to Local Authorities, selected states currently place restrictions on these professionals from executing this task.

The World Bank’s Ease of Doing Business ranking indicates that delays in the approval of construction permits, cost of obtaining a permit, and number of procedures involved in obtaining a permit are challenges faced by the industry. In 2015, it was recorded that it takes over 74 days to obtain a construction permit in Malaysia compared to 66 days in Hong Kong, 44 days in the United Arab Emirates, 29 in South Korea and only 26 days in Singapore (as shown in Figure 18). Regulations affecting the construction industry involve multiple authorities at the federal, state and local levels. Thus, a concerted, coordinated, effort is needed to reduce these regulatory obstacles.

**Room to Enhance Public Perception of the Industry and Limited Awareness of Initiatives to Improve the Image of the Industry**

Public perception of the construction industry remains low. A Public Perception on Construction Industry Survey was commissioned by CIDB in 2014 and surveyed participants across several dimensions including safety, quality, environmental friendliness and adoption of technology. The survey found that the industry achieved an overall perception index of 65. Further, only two in three members of the public have a positive perception of the industry. Moreover, more than 40 percent of youths (below 24 years of age) have a lower perception of taking up a career in construction, citing safety issues as a deterrent for them to enter the industry. When it comes to public awareness of government-led initiatives that benefit industry stakeholders, 60 per cent of respondents declared that they were not aware of such initiatives. This would explain the low levels of engagement and take-up of initiatives in the industry despite their importance.

*Figure 18 Days to Obtain Construction Permit by Country (2015)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Days to Obtain Construction Permit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>26</td>
</tr>
<tr>
<td>South Korea</td>
<td>29</td>
</tr>
<tr>
<td>UAE</td>
<td>44</td>
</tr>
<tr>
<td>Qatar</td>
<td>58</td>
</tr>
<tr>
<td>Bahrain</td>
<td>60</td>
</tr>
<tr>
<td>Denmark</td>
<td>64</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>66</td>
</tr>
<tr>
<td>Malaysia</td>
<td>74</td>
</tr>
<tr>
<td>US</td>
<td>89</td>
</tr>
<tr>
<td>Turkey</td>
<td>169</td>
</tr>
</tbody>
</table>

33. The World Bank, 2015
34. CIDB survey on Public Perception 2014
Initiatives

CITP aims for quality, safety and professionalism to be ingrained in the culture of the industry. Quality, safety and professionalism are prerequisites to transforming the construction industry into a responsible, developed industry. Based on the four challenges outlined in the previous section, the CITP puts forward four key initiatives.

Q1 INITIATIVE Q1
Increase emphasis on quality and implement quality assessments

To promote and raise quality standards of the construction industry, this initiative proposes to increase implementation of quality assessments, such as Quality Assessment System in Construction (QLASSIC), which assesses contractor workmanship, as well as broader quality assurance for construction of buildings. The drive to increase the use and adoption of the system will be essential to drive overall quality improvement in increasing the quality of both contractors and the overall construction work. To raise the take-up of QLASSIC, several policy changes are recommended. It is recommended for QLASSIC measurement to be included into the prerequisites for the issuance of the Certificate of Practical Completion (CPC) for public projects worth more than RM 50 Million and for the issuance of the Certificate of Completion and Compliance (CCC) for private projects worth more than RM 50 Million. It is also recommended that client ministries consider past QLASSIC scores of contractors as one of the criteria during the tender evaluation process.

To further emphasise the importance of quality, it is recommended that internationally-recognised quality certifications (e.g., ISO 9000) be strongly encouraged, and especially to reflect G8\(^{35}\) contractor qualification.

Financiers will be encouraged to include contractor QLASSIC scores as an input in financial risk assessments when processing project financing applications. In a similar vein, publicly-listed construction-related companies can be encouraged to disclose internationally-recognised quality certifications (e.g., ISO 9000) and ratings (e.g., QLASSIC scores) in their annual reporting\(^{36}\).

\(^{35}\) New category of high performing construction players to be introduced in CITP and described in Initiative Q3
\(^{36}\) Includes publicly-listed companies whose subsidiaries include construction companies or contractors
TAKE-UP OF QLASSIC BY LARGE DEVELOPERS IN MALAYSIA

Large, top-notch developers in Malaysia have begun to adopt the Quality Assessment System in Construction (QLASSIC). QLASSIC is beneficial to clients and contractors for a number of reasons.

In terms of performance measurement, QLASSIC sets acceptable standards in project delivery through measurement and evaluation of workmanship quality for various construction elements in building projects. Assessment is completed via site inspections, field tests, material tests and functional performance. Since its development in 2006, its adoption has slowly increased.

Recently, there has been a steady rise in up-take of QLASSIC, especially by large, leading developers. MK Land Group of Companies has voluntarily made QLASSIC a mandatory requirement for contractors who participate in MK Land projects.

MK Land believes that adoption of QLASSIC provides the clarity of expectation among the developer, consultants and contractors with regards to the desired final quality of the products. The desired quality is further emphasised in the model units built for the respective products as the benchmark to follow, and also for the viewing by the prospect buyers. Currently MK Land targets for QLASSIC achievement of 70% and more depending on the products, and this target will be raised steadily over time.

To complement the QLASSIC requirements, MK Land has made it mandatory for all its technical officers, the consultants’ officers and all vendors to be trained in and qualified with QLASSIC Standards.

Among other large developers who have adopted QLASSIC are Sime Darby Properties and Sunway Construction Berhad, to name a few. The adoption of QLASSIC by large developers has surely introduced another dimension of competition in the construction industry – developers can begin to market themselves using QLASSIC performance scores.

Sources:
The CITP also recommends the implementation of independent quality assurance and quality control (QA/QC) assessments, which go beyond the scope of QLASSIC and buildings. These assessments should move beyond the assessment of workmanship to include assessing aspects such as the quality of materials used, quality of practices and processes adopted by contractors, and the like, and go beyond buildings to include infrastructure workmanship. These assessments should be undertaken by independent assessors to ensure objectivity of scores and results for end-consumers.

Taken together, it is hoped that heightened demand and supply of quality-rated buildings will benefit the end-consumers. The ability to assess the quality of workmanship of a construction project based on the relevant approved standard has multiple benefits to the industry and the overall economy. This is hoped to incentivise competition amongst contractors to perform at higher levels. Furthermore, compliance to higher standards of quality, workmanship and performance will also drive up professionalism of the industry.

**Alignment with national programmes**

This initiative is aligned with the second strategic thrust of RMK11: ‘Improving wellbeing for all’. Specifically, this initiative will contribute to the objectives of Focus area B which seek to provide adequate and quality affordable housing to poor, low- and middle-income households.

**Highlighted roles of key stakeholders**

Support for implementation is required from key agencies such as the Ministry of Urban Wellbeing, Housing and Local Government (PKPT), Jabatan Kerja Raya (JKR), Implementation Coordination Unit (ICU), and the likes. Scope of support includes incorporating QLASSIC measurement as prerequisite for Certificate of Practical Completion (CPC) and Certificate of Completion and Compliance (CCC), including QLASSIC score as a factor in project risk assessment, and including QLASSIC in Sales and Purchase Agreement (SPA) template to increase consumer awareness on quality. In addition, collaboration is needed to develop a construction quality programme on standards, guidelines, training, and sharing of best practices.

At the same time, CIDB will expand the scope of QLASSIC assessment to include an assessment for Structural and Mechanical and Electrical (M&E) works. CIDB will also continuously enhance the standards and guidelines for QLASSIC assessment to ensure relevant minimum standards are being assessed. Beyond conducting training and accreditation to ensure there is an adequate number of assessors, CIDB will promote industry and public adoption of QLASSIC. These are in line with CIDB’s mandated function to advance quality assurance in construction, in accordance with the Amendment Act 520 (2011).

**Initiative Q2**

**Improve workplace safety and workers’ amenities**

The CITP puts forward several recommendations to raise safety levels in the industry.

**Improve level of occupational safety and health at construction site**

The CITP recommends greater emphasis to be placed on occupational safety and health (OSH) certifications. Construction-specific safety training curricula will be developed and training courses rolled out to increase the quality and quantity of certified safety officers (SHO and SSS) and third party OSH inspectors. To elevate the profile of safety, G8 contractors will demonstrate internationally-recognised safety certifications (e.g., OHSAS 18001). Financiers can also play a role in ensuring that high-standard safety practices are adopted in projects they finance by including safety certifications (e.g., OHSAS 18001) into their risk assessment for project financing.

The CITP places an emphasis on the implementation of ratings and assessments to measure the success of certain standards and policies in construction. In this regard, CITP recommends the increase in adoption of the OSH assessment Safety and Health Assessment System in Construction (SHASSIC). SHASSIC is an independent method to assess and evaluate the safety and health performance of a contractor.

---

37. Chapter 2, 11th Malaysia Plan
38. List of stakeholders and roles is not exhaustive
39. Act 520 is the Construction Industry Development Board Act (1994); It is an Act to establish the Construction Industry Development Board (CIDB) Malaysia and to provide for its functions relating to the construction industry. The 2011 amendments, which were gazetted in June 2015 granted CIDB various additional new functions
40. New category of high performing construction players to be introduced and described in Initiative Q3
Four Strategic Thrusts

in construction works or projects. It was developed by a Technical Committee comprised of industry stakeholders and published in the Construction Industry Standard, CIS 10: 2008 in November 2008. CITP will also endeavour to update the Code of Practice for on-site safety and health management in construction.

Furthermore, disclosure of health and safety management certifications can be recommended during listing and annual reporting for publicly-listed construction-related companies. Overall, CITP recommends adequate provision for OSH embedded in the contract provisions, and cost should be allocated and not compromised to ensure improved safety practices and higher safety standards at the site and throughout the project.

Regulate minimum level of construction workers’ amenities

Firstly, more stringent requirements on occupational safety and health will be introduced. An expert panel appointed by the MOW to study safety issues in the construction industry has identified several themes to improve construction safety and has put forward comprehensive recommendations to resolve these issues. The expert panel report states six key areas with issues related to health and safety in construction (as shown below), majority of which are addressed by the CITP. The Working Group for the safety initiatives within CITP will further address issues and implement recommendations of the expert panel report, beyond those described below.

- Laws and statutes
- Safety aspects (such as awareness, incentives, and the likes)
- Competency
- Roles and responsibilities
- Design guidance and specifications
- Procurement practices

Secondly, a Malaysian Standard (MS) Code of Practice to define guidelines for temporary construction site workers’ amenities will be developed by CIDB and the Department of Standards Malaysia. As evidenced by the practice in Singapore, the Government can play a critical role in driving the improvement of living conditions of construction workers. To further strengthen safety initiatives, Act 446, which concerns workers’ minimum standard of housing and amenities, will be extended to include the construction sector. To support this mandate, CIDB will collaborate with industry players and facilitate the upgrading or construction of workers’ living quarters to be standards-compliant. Industry players and regulators can play a critical role in emphasising the demand for improved standards for workers’ wellbeing. Improving the living conditions of construction workers will support greater productivity and drive further progress of the industry. Figure 19 further expounds on the recommendation to improve the living conditions for construction workers.

**Figure 19 Strengthen requirements for workers’ living conditions**

Examples of requirements

<table>
<thead>
<tr>
<th>Amenities</th>
<th>Example of requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room</td>
<td>• Min. room size and height</td>
</tr>
<tr>
<td></td>
<td>• Proper bed, lighting and ventilation</td>
</tr>
<tr>
<td>Sanitary facilities</td>
<td>• Min. no. of toilets with proper sewage system</td>
</tr>
<tr>
<td>(toilet, bathroom)</td>
<td>• Min. bathroom size</td>
</tr>
<tr>
<td>Cooking and dining</td>
<td>• Min. kitchen size and height</td>
</tr>
<tr>
<td></td>
<td>• Dining area to have proper ventilation, disposal system</td>
</tr>
<tr>
<td>Leisure and social</td>
<td>• Provide community hall for workforce above a certain size</td>
</tr>
<tr>
<td>Others</td>
<td>• Provide proper signage, community relations management plan, safety committee etc.</td>
</tr>
</tbody>
</table>

---

41. Includes publicly-listed companies whose subsidiaries include construction companies or contractors
42. Workers’ Minimum Standards of Housing and Amenities Act 1990
43. Full list of requirements to be detailed out in the Malaysian Standard Code of Practice for workers’ amenities, targeted to be published by Q1 2016
Benchmark 1

SINGAPORE GOVERNMENT PLAYS A CRITICAL ROLE IN DRIVING BETTER WORKER LIVING CONDITIONS

The government takes an active role in driving better housing for construction workers in Singapore. This is done through stipulating regulations and enforcement. Specific and strict regulations, set by multiple government agencies, must be adhered to in workers’ accommodation. These regulations include compliance with land use, building structural safety standards, fire and safety standards, and drainage and sanitary/ sewerage requirements. The requirements on workers’ dormitories are also specified, as follows:

- Contractors are required to provide adequate housing for foreign workers regardless of projects. The Singapore government also allocates specific land area for the building of dormitories for foreign workers by putting land up for tender and having private operators design, build and operate the dormitories as commercial ventures.

- A typical, purpose-built workers’ dormitory would include a social domain (basketball court, hard court, open field, outdoor fitness, food court, mini-mart, barber shop) and a living domain (gymnasium, laundry, sickbays, reading rooms, TV rooms, multi-purpose halls).

- Government agencies regularly conduct checks to ensure dormitories adhere to desired living conditions, cleanliness levels, and that amenities are in working condition. The Building and Construction Authority (BCA), an agency championing the development of an excellent built environment in Singapore, conducts multiple checks per month on the dormitories that it oversees. Penalties, including fines of up to SGD 10,000 and 12-month jail terms, may be imposed on employers who do not provide acceptable housing.

Source:
1. Building & Construction Authority Singapore (http://www.bca.gov.sg/)
“The Central Labour Quarters (CLQ) concept was introduced by Mass Rapid Transit Corporation Sdn Bhd to provide good, clean and safe living quarters for workers of the MRT Project. We believe it is a basic right of a worker to be entitled to a proper living environment.

Worker housing in the construction industry has long been neglected. We hope our CLQ is the first step in a long journey towards setting a standard in providing proper housing for the industry’s single-most valuable asset, its workers. Our perspective is that a happy worker will be a productive worker.”

Dato’ Sri Shahril Mokhtar / Chief Executive Officer / MRT Corp

Case Study 2

HOUSING WORKERS IN THE MRT PROJECT

MRT Corp introduced Central Labour Quarters (CLQ) for the MRT project in the Klang Valley, which began construction in 2011, to establish a new housing standard for foreign workers in Malaysia

The CLQ complexes are located in Sg. Buloh, Cheras, Kajang and Jalan Cochrane in Kuala Lumpur. The four complexes cost up to RM 80 Million to build and house up to 12,000 people. The complexes resemble mini townships as they not only contain dormitories but also other facilities. The CLQs are furnished with comfortable cabins that accommodate six individuals each, and there is enough space for each individual to live and rest comfortably. Other amenities provided in each complex include a cafeteria, recreational facilities, a clinic, laundry services, sundry shops, and prayer rooms.

Sources:
1. MRT Progress Report 2013
2. Ng, B. (2014, May 1). MRT workers feel at home in centralised labour quarters. The Malay Mail,
Alignment with national programmes
This initiative will raise overall living standards for construction workers. The minimum standard for living conditions of workers not only improves the welfare, safety and wellbeing of construction workers, but also fosters a safer environment for the rest of the rakyat. Improved treatment of construction workers also makes streets and communities safer for rakyat peace of mind, which is also a priority in RMK11. This initiative is thus aligned with the second strategic thrust of RMK11: ‘Improving wellbeing for all’.

Highlighted roles of key stakeholders
Support for implementation will be needed from key stakeholders including the Ministry of Works (MOW), Ministry of Human Resources (MOHR), Department of Safety and Health (DOSH), client ministries, Department of Standards, Local Authorities, training institutes, and the likes. Scope of support includes publication of the Malaysian Standard Code of Practice for workers’ amenities, in collaboration with CIDB. Beyond that, support is required for the extension of Act 446 (which is under the purview of MOHR) to the construction industry. Support will also be needed to facilitate development of qualifying third-party living quarters. In addition, collaboration among CIDB and various stakeholders will be needed to:
- Explore inclusion of compliance with workers’ amenities standards in foreign worker permit issuance criteria
- Increase scale of training to develop higher quantity and quality of certified safety personnel
- Include safety and health certifications as prerequisite for financing of large-scale projects
- Include adequate provision for safety and health in project cost

At the same time, CIDB will develop guidelines for the implementation of the Code of Practice for workers’ amenities as well as for the Code of Practice for on-site safety enforcement. CIDB will also develop a database of Malaysian Standard-compliant or MS-compliant living quarters available in Malaysia. This is to facilitate contractors’ search for living quarters for workers and compliance with new regulations. CIDB will also include provision of MS-compliant living quarters as a requirement in contractor license renewal. Beyond that, CIDB will continuously provide training and accreditation services to increase the number of competent safety personnel. These are in line with CIDB’s mandated function to monitor the safety of construction projects, in accordance with the Amendment Act 520 (2011).

Q3
IMPROVE EASE OF DOING BUSINESS BY ADDRESSING REGULATORY CONSTRAINTS

Strengthen One-Stop-Centre for all construction permits/approvals
The CITP proposes to reduce regulatory obstacles in obtaining construction permits by improving and expediting key processes and resolving roadblocks. The ~150 One-Stop-Centres (OSCs) in Malaysia need to be strengthened, streamlined and enhanced. A full review of One-Stop-Centres is recommended to identify specific process and procedure gaps and challenges in order to develop concrete initiatives to raise the ease of doing business.

Across OSCs, the construction permit approval process will be automated and thus accelerated. It is recommended that the submission and approval of all construction permits will eventually be done electronically. This includes back-end systems integration of several key regulatory bodies, for example, BOMBA, water operators, TNB, and the likes. Error-checking mechanisms will be employed to streamline received applications and pre-empt unnecessary delays. Electronic approval will also lower the risk of unnecessary delays at any stage of the approval process by allowing for a very transparent and clear electronic tracking and monitoring system.

The CITP further encourages a public-private partnership model to accelerate the approval of construction permits. In the proposed partnership, technical agencies can consider devolving partial processing responsibility to a licensed private party (where feasible – for example, site inspections) to increase the efficiency of processing. Technical
agencies would however retain decision-making power as ultimately, construction permits are exclusively issued by the technical agencies. This model has been successful in the UK, as the private sector was able to help address the backlog in processing construction permits faced by the local authorities.

**Benchmark 2**

**UK PUBLIC-PRIVATE PARTNERSHIP MODEL FOR CONSTRUCTION PERMIT APPROVALS**

In the UK, the government has successfully utilised a public-private partnership model to address delays in the approval of construction planning permissions. The public-private partnership model is aimed at accelerating the approval for the inspection of buildings, as local building authorities can only typically issue decisions within five to eight weeks from the submission of applications.

To address these delays, applicants currently have the option of engaging the services of third-party authorised Approved Inspectors. Approved Inspectors can thus replace the traditional and lengthy approvals process in construction planning permissions. Approved Inspectors are private personnel who are licensed to carry out inspection work on premises. Approved Inspectors typically take on the role of a one-stop shop for the builder, and are responsible for the approval of plans, typically in an expedited fashion in return for a higher fee.

Building regulations approval falls under Building Control Bodies (BCBs) – either from the Local Authority or through an Approved Inspector. If an Approved Inspector is used, the Local Authority is jointly notified by the respective person(s) involved. This is known as an “Initial Notice”. The Local Authority then confers building regulations verification to the appointed Approved Inspector. If a Local Authority takes responsibility for the approval, the procedures will be set out in the Building Regulations in which there are three types of application for approval that can be made: Full Plans, Regularisation or Building Notice. If the Approved Inspector believes that the requirements do not adhere to building regulations, a certificate of completion will not be given and if the matter remains unresolved between the Approved Inspector and the client, the Initial Notice may be cancelled and the responsibility will then be reverted to the Local Authority.

There are currently about 60 Approved Inspectors in England and Wales, accounting for about 20 per cent of all building control work. They range from specialist individuals to very large businesses. The public-private partnership has worked well in the UK and about half of the country’s top 10 building control bodies (by value) are Approved Inspectors, demonstrating the popularity and effectiveness of the private-sector route.

Sources:
1. Dealing with Construction Permits in the UK, Doing Business Project, World Bank, June 2014
2. The Planning Portal, UK
3. Association of Consultant Approved Inspectors, UK
Consider set up of tribunal for construction permit dispute resolution
In the event of any disputes in dealing with construction permits and approvals, either due to different interpretation of regulations or where regulations are unclear, it is recommended that a tribunal be considered as a recourse for regulatory appeals or disputes. The tribunal can resolve disputes between regulators and industry on a case-by-case basis. It will help to resolve cases where there may have been a misapplication of regulations. In cases of outdated or ineffective application of regulations, the tribunal can call for a review of regulations. The decisions made by the tribunal will establish precedents that will eliminate future concerns or ambiguity and remove delays and added costs to industry. This model has been successfully employed by several developed economies, such as Australia and can be considered for Malaysia.

Streamline and enhance contractor registration
CIDB on its part will also be streamlining contractor registration across all agencies. A simple-to-use system that allows for online application and approval for contractors will be key. The CITP also recommends the establishment of a new classification of contractor called G8, to recognise flagship Malaysian players capable to be champions and leaders in the construction industry. A construction player that demonstrates specific stated criteria can be awarded the coveted G8 classification. In return, there will be opportunities accorded to the G8 companies. The criteria for G8 will include registration as a G7 contractor (see Figure 21 for the definition and classification of contractor grades), and demonstration of minimum standards and certifications.

Benchmark 3

AUSTRALIAN ADMINISTRATIVE APPEALS TRIBUNAL (AAT)

Australia has successfully implemented the concept of a regulatory review tribunal. The Australian Administrative Appeals Tribunal (AAT) was established and has been in operation since 1976, following a Parliamentary review of administrative processes. The AAT reviews administrative decisions made by ministries, departments and other tribunals, and hears cases across a diverse range of issues beyond construction: from worker’s compensation to mutual recognition of occupations. In 2012, it reviewed some 6,200 applications, resolving 76 per cent of those cases in 12 months. The AAT can review any decision governed by acts that allow for an application for an appeal with the tribunal. There are around 400 acts and regulations that confer jurisdiction to the tribunal.

Source:
1. Australian Administrative Appeals Tribunal (http://www.aat.gov.au/)
To facilitate uplifting of performance of contractors and increase the number of contractors qualifying as G8 contractors, support will be provided to the industry. SCORE is a special programme co-developed by CIDB and SME Corp to assess the capacity and capability of local contractors in Malaysia. It evaluates seven key areas:

1. Business performance
2. Financial capability
3. Technical ability
4. Project management
5. Procurement management
6. Best Practices
7. Management capabilities

In the assessment, marks are allocated according to the seven areas above and the total marks awarded correspond to a rating between 0 and 5*. While SCORE rating will not be included in the criteria for G8 qualification, good performance as measured by SCORE will indicate a contractor’s likelihood of qualifying as G8. As G8 qualification will require high standards and excellent performance, a good SCORE rating will help contractors move closer towards G8 qualification.

In line with the Internationalisation thrust-level outcomes to develop 10 companies achieving 5* and 50 Malaysian companies to earn G8 status, CITP recommends the establishment of a help desk, in collaboration with SME Corp, to provide advisory services to remedy lower SCORE ratings. This would include a simulation of SCORE with changes in specific indicators, to demonstrate tangible changes contractors can make to improve their SCORE ratings.

**Enhance culture and practices by learning from decided construction court cases**

Key insights from decided construction cases will be documented and commented on by industry experts in publications. They will serve to recommend areas for improvement on issues such as construction processes, terms of contracts, and challenges in existing Acts, such that those issues will not surface further going forward. The commentaries will also serve to set precedence for future construction court cases. These commentaries will be published annually and made available to industry players and the general public.

Initiative Q3 contributes to the Quality, Safety and Professionalism thrust of the CITP in several ways. The consolidation of local authority procedures and processes through strengthening of the OSCs will reduce time in construction permit approval process, thereby increasing efficiencies and quality of service delivery in the industry. A reduction

“**We hope with the award of this first five-star SCORE rating, other local players will be encouraged to take SCORE as a learning platform to develop their competencies. In the long run, this will help develop a more robust and internationally-competitive construction industry for our country, in terms of efficiency, productivity, quality, safety and health.**”

Mr. Ubull Din Om / Managing Director / Engineering Division / GAMUDA Berhad
The learning process gathered from decided cases is necessary for the construction industry to progress and transform to be more effective and efficient.

The Right Honourable Tun Arifin bin Zakaria (Dato’ Lela Negara) / Chief Justice of Malaysia

in bureaucratic challenges will also reduce opportunities for corruption and drive up professionalism of the industry. Enhancing learning from decided construction cases to identify areas prone to disputes can help to improve practices. It will also reduce or eliminate disputes, and this will lead to higher levels of professionalism in the industry. At the same time, the commentaries and learning from decided cases will set a precedence for lower courts to expedite judgment in future cases and improve efficiency of the judicial process in construction.

Alignment with national programmes

Initiative Q3 is aligned with the RMK11 aspiration to Transform public service for productivity (Chapter 9). Strengthening of OSCs will contribute to the RMK11 goal to identify and eliminate unnecessary bureaucratic processes such as approvals for licenses and permits. The strengthening of OSCs is also aligned with the RMK11 strategy to review and shorten time taken for service delivery in frontline agencies, including Local Authorities. This will include integration of services at the front-end of delivery and consolidation of inter-agency back-end processes. The rationalisation of OSCs is also aligned with the focus area to rationalise public sector institutions for greater productivity and performance.

Highlighted roles of key stakeholders

Support for implementation is required from key agencies such as KPKT, Local Authorities, MPC, and the likes. Scope of support includes conducting a comprehensive process review of OSCs. In addition, stakeholder engagement will be required to develop an integration roadmap to automate construction permit submission and approval process and to explore potential partnership with private sector players for permit processing. Collaboration will also be required to begin roll out of integration across Local Authorities, including implementation of e-submission and e-approval and to provide training for OSC committee members, staff and other stakeholders to ensure understanding of revised policies and processes. In addition, for the tribunal to be considered, stakeholders will need to come together to align on the scope, Terms of Reference (TOR), authority, mechanism, membership, funding, jurisdiction and operating framework, and to pilot and roll out.

At the same time, CIDB will drive streamlining of contractor registration regulations, policies and procedures to increase efficiency and will establish a G8 category for construction industry leaders. To support CITP’s aspirations to develop more G8 and 5* SCORE rating contractors, CIDB will set up a helpdesk to provide advisory services to contractors. This is in line with CIDB’s mandated function to provide advisory services to the industry, in accordance with the Amendment Act 520 (2011). CIDB will also develop a comprehensive IT system that includes online application for contractor registration and e-approval. Beyond that, CIDB will compile reported construction cases from the Judiciary and select key cases for commentary and publish a construction report or journal with annual commentary.

49. Strategy A1, Focus area A, 11th Malaysia Plan
50. List of stakeholders and roles is not exhaustive
The CITP strives to improve the image of the construction industry to both correct misconceptions and to drive the uptake of CITP initiatives. Central to this initiative is the development of a clear, comprehensive, and strategic communications plan. CITP will leverage the power of new media as a medium to communicate and engage with the public and industry stakeholders at all levels.

It is recommended that positive messages are promoted to address the stigma the industry faces. For instance, facts that explain the extent of the construction industry’s rising importance in Malaysia will be made known more publicly. Similarly, efforts will be made to raise the profile of the initiatives that are being undertaken. CIDB will also play a central role in promoting the achievements and progress of the various CITP initiatives.

An example is the upcoming initiative to upgrade workers’ dormitories to be standards-compliant. A portal featuring the standards and requirements will help to raise awareness of, and support for, this initiative. Improving access to information on both the standard requirements and regulations for workers’ dormitories, as well as the database of such housing available will increase the speed at which contractors are able to comply with these requirements.

There will also be efforts to promote take-up of CITP initiatives by the development of a CITP portal, where contents of CITP initiatives can be viewed and shared in text, visual and video formats. There will also be continuous engagement with industry stakeholders through a variety of platforms to promote CITP initiatives. A key message that will be conveyed through these engagements will be the extent of benefits CITP offers to industry stakeholders to encourage further collaboration. The CITP thus far has been a shared journey and the implementation of the programme will continue to require cohesive industry participation to ensure success as well as support from the government and various other stakeholders. To improve the image of the industry and raise awareness of the initiatives in the CITP, key stakeholders and drivers of the CITP need to collaborate and convey integrated messages that seek to raise uptake of and buy-in for CITP initiatives to ensure implementation success. Ultimately, the aim is to erase negative perceptions of the construction industry and enable a transformation of the Malaysian construction industry to one that is befitting a high income nation.

**Highlighted roles of key stakeholders**

CIDB will lead the implementation of this initiative. CIDB will develop and maintain a dedicated CITP portal to disseminate information on initiatives, including progress reports and will roll out a comprehensive communications plan to obtain buy-in from stakeholders across the board. To strengthen this, CIDB will collaborate with other stakeholders to develop targeted and tailored messages for different stakeholders on broader benefits of CITP. CIDB will also measure the impact of CITP through a study on the ‘Public Perception of the Construction Industry’.

---

51 List of stakeholders and roles is not exhaustive
Lack of adequate emphasis on quality assessment and assurance
- Incidence of subpar quality built environment, with usage of lower quality materials and adopting low-quality workmanship
- Insufficient onsite supervision and enforcement
- Limited demand for quality-rated buildings
- Limited up-take of quality assessments

Increase emphasis on quality and implement quality assessments
- Expand scope of QLASSIC assessment to cover Structural and Mechanical & Electrical (M&E) works, etc.
- Recommend usage of minimum QLASSIC scores in awarding public project
- Recommend for financial institutions to utilise quality assessment scores in risk assessment of project financing
- Increase quantity of independent QLASSIC assessors
- Increase quality of independent QA/QC assessors

Key outcomes by 2020
- QLASSIC score as a key deciding factor among public building tender proposals of contractors with small margin difference for commercial assessment
- Independent QA/QC requirement introduced for large public projects and by G8 contractors
- Large projects assessed annually using QLASSIC
- QLASSIC score included in Sales and Purchase Agreements (SPAs)
- Annual increase in accredited QLASSIC assessors
- Doubling of large public projects exceeding a minimum QLASSIC score of 70

Highlighted roles of key stakeholders
- Key stakeholders: KPKT, JKR, ICU, and the likes.
- Scope of support:
  - Incorporating of QLASSIC measurement as prerequisite for Certificate of Practical Completion (CPC) and Certificate of Completion and Compliance (CCC)
  - Including QLASSIC score as a factor in project risk assessment
  - Including QLASSIC in Sales and Purchase Agreement (SPA) template to increase consumer awareness on quality
  - Collaboration is needed to develop a construction quality programme with standards, guidelines, training, and sharing of best practices
- CIDB role:
  - Expand scope of QLASSIC assessment to include an assessment for structural and Mechanical and Electrical (M&E) works
  - Enhance the standards and guidelines for QLASSIC assessment to ensure relevant minimum standards are being assessed
  - Promote industry and public adoption of QLASSIC

Not Exhaustive
### Case for change

Poor conditions on worksite, including workers’ amenities and safety and health standards

- Low levels of safety awareness
- Room to enhance regulatory and enforcement efforts
- High fatality rates, when compared to other sectors and other countries
- Low-standard of living quarters on construction sites with limited workers’ amenities, especially for foreign workers

### Initiatives

Improve workplace safety and workers’ amenities

- Heighten importance placed on occupational safety and health certifications and enforcements
- Strengthen pool of competent safety officers and third-party Occupational Safety & Health (OSH) inspectors
- Recommend for financial institutions to include safety certifications in risk assessment of project financing
- Encourage disclosure of occupational safety and health management performance in annual reporting for public-listed companies and for listing purposes
- Develop Malaysian Standard to define guidelines for workers’ amenities; Act 446\(^{52}\) will be extended to include construction sector

### Key outcomes by 2020

- Construction-specific Safety and Health Officers (SHO)/Site Safety Supervisor (SSS) training modules developed and implemented
- Annual increase in trained SHO/SSS
- Annual increase in independent OSH checkers/inspectors
- Annual increase in contractors certified with MS1722/OHSAS 18001
- All G8 contractors certified with MS1722/OHSAS 18001
- Malaysian Standard (MS) Code of Practice for temporary construction site workers’ amenities and accommodation published and adopted
- Act 446 on workers’ amenities extended to construction sector
- MS-compliant worker dormitories provided in large pilot projects

### Highlighted roles of key stakeholders

- Key stakeholders: MOW, MOHR, DOSH, client ministries, Department of Standards, Local Authorities, training institutes, and the likes
- Scope of support:
  - Publication of Malaysian Standard Code of Practice for workers’ amenities
  - Also needed to facilitate development of qualifying third-party living quarters
  - Explore inclusion of compliance with workers’ amenities standards in foreign worker permit issuance criteria
  - Increase scale of training to develop higher quantity and quality of certified safety personnel
  - Include safety and health certifications as likely prerequisite for financing of large-scale projects
  - Include adequate provision for safety and health in project cost

- CIDB role:
  - Develop guidelines for the implementation of the Code of Practice for workers’ amenities as well as for the Code of Practice for on-site safety enforcement
  - Develop a database of Malaysian Standard-compliant or MS-compliant living quarters available in Malaysia
  - Provision of MS-compliant living quarters as a requirement in contractor license renewal
  - Provide training and accreditation services to increase the number of competent safety personnel

---

52. Workers’ Minimum Standards of Housing and Amenities Act, 1990
Complex regulatory frameworks, processes and procedures, which lead to delays in permits and approvals

- Complex regulatory frameworks that are difficult to navigate, with added bureaucracy
- Dated regulations that do not necessarily accommodate modern construction methods
- Discrepancies in interpretation and application of regulations
- Uniform Building By-Laws (UBBL) amendments conducive to boosting IBS and modern construction methods yet to be widely adopted

Improve ease of doing business by addressing regulatory constraints

- Streamline construction permit approval process by addressing gaps and overlaps in regulations
- Accelerate the submission, evaluation and approval of construction permits through the development of an IT system that integrates all relevant processes and systems
- Consider tribunal to accelerate the resolution of construction-related disputes
- Streamline contractor registration regulations, policies, and procedures to increase efficiency and to develop a comprehensive IT system for contractor registration
- Publish annual commentary and analysis on decided construction cases

Key outcomes by 2020

- Average number of construction permit approval procedures nationwide reduced
- Average number of days to obtain permit approval nationwide reduced
- e-submission and e-approval rolled out across at least 20 Local Authorities (LAs)
- Dispute applications resolved by the tribunal within 6 months of receipt
- CIDB contractor registration portal piloted
- Eligibility criteria for G8 category finalised and launched
- Criteria and conditions for accreditation of facility managers launched
- A minimum number of companies earn G8 status
- 10 companies facilitated in achieving 5* SCORE rating
- Outcome based results from publishing annual commentary and analysis on construction cases

Highlighted roles of key stakeholders

- Key stakeholders: KPPT, local authorities, MPC and the likes
- Scope of support:
  - Conduct a comprehensive process review of OSCs
  - Develop an IT integration roadmap to automate construction permit submission and approval process
  - Explore potential partnership with private sector players for permit processing
  - Begin roll out of IT integration across Local Authorities, including implementation of e-submission and e-approval
  - Provide training for OSC committee members, staff, other stakeholders to ensure understanding of revised policies and processes
  - Finalise the scope, Terms of Reference (TOR), authority, mechanism, membership, funding, jurisdiction, framework for the tribunal, and to pilot and roll out the tribunal
- CIDB role:
  - Drive streamlining of contractor registration regulations, policies and procedures to increase efficiency and will establish a G8 category for construction industry leaders
  - To support CITP's aspirations to develop more G8 and 5* SCORE rating contractors
  - Develop a comprehensive IT system that includes online application for contractor registration and e-approval
## Four Strategic Thrusts

### Case for change

Complex regulatory frameworks, processes and procedures, which lead to delays in permits and approvals (cont’d)

- Room to enhance public perception of the industry and awareness of initiatives to improve the image of the industry
  - Room to improve overall perception of construction
  - Lack of awareness of initiatives

### Initiatives

- Promote and raise awareness of CITP initiatives
  - Increase awareness of importance of industry and benefits accruing to the workforce and all key stakeholders to raise profile of positive developments in construction
  - Collaborate with marquee partners to raise credibility of CITP initiatives

- “One stop” knowledge portal established to disseminate CITP information
  - Increase in public perception of construction industry index from 2014 baseline score

### Key outcomes by 2020

- CIDB role:
  - Lead the implementation of this initiative
  - Develop and maintain a dedicated CITP portal to disseminate information on initiatives
  - Collaborate with key stakeholders to develop targeted and tailored messages on broader benefits of CITP and construction overall
  - Measure impact of CITP through a study on ‘Public Perception on Construction Industry’

### Highlighted roles of key stakeholders

- Compile reported construction cases from Judiciary
- Select key cases for commentary and publish a construction report or journal with annual commentary

---

Not Exhaustive
Quality, safety and professionalism are prerequisites for transforming the construction industry into a responsible, developed industry. Today, high accident and fatality rates, limited integration of safety into the work culture, poor quality construction work and collapsing infrastructure, and delays in obtaining approvals for construction permits are some of the major issues that still persist in the industry today. These challenges affect the general public, businesses, workers and consumers.
4.2 ENVIRONMENTAL SUSTAINABILITY

CITP aims for Malaysia’s environmentally sustainable construction to be a model for the emerging world, and especially ASEAN countries. Key outcomes under this thrust by 2020 include 100 per cent of large infrastructure projects to exceed sustainability requirements with a 4 Mt CO₂-equivalent reduction per year. This Environmental Sustainability Thrust is in line with the fourth strategic thrust of RMK11: ‘Pursuing green growth for sustainability and resilience’.

There are three specific issues identified to be addressed under environmental sustainability:

- Lack of sustainability-rated construction; Buildings and infrastructure are not always resilient to natural calamities
- High carbon emissions and energy usage of buildings
- High volume of construction and demolition waste dumping

To address the above challenges, the CITP puts forward five core initiatives:

- 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
ENVIRONMENTAL SUSTAINABILITY

OUTCOMES

Malaysia's sustainable infrastructure: a model for the emerging world

100% of large infrastructure and building projects exceed sustainability requirements

4 Mt CO₂ equivalent reduction per year

Environmental sustainability to support the Sustainability goal under the 11th Malaysia Plan

A more responsible construction industry will lower CO₂-eq. emissions while compliance with ratings will make our infrastructure more resilient and sustainable

CASE FOR CHANGE

High construction and demolition (C&D) waste dumping

- Up to 40% of illegally dumped waste from C&D recorded in one state alone

Natural disaster damage driven by lack of building / infrastructure resilience

- ~RM 2.9 Bn damage from recent floods in the East Coast of Malaysia
- RM 800 Mn for repair and reconstruction of schools, hospitals, roads, and bridges

GDP: CO₂-eq. emissions in Malaysia among lowest in world

Malaysia: $1,500
Singapore: $3,700
Japan: $3,100
Turkey: $3,000
India: $2,300

HIGHLIGHTED RECOMMENDATIONS¹

Reduce irresponsible waste during construction

- Facilitate procurement of recycling for C&D waste for recycling plants in priority areas
- Heighten enforcement against illegal dumping
- Introduce taxation mechanism on excessive waste

Promote and raise sustainable practices

- Drive sustainable construction via Centre of Excellence
- Develop and promote rating tools
- Support and promote sustainable development projects

Drive compliance to environmental sustainability requirements

Recommend sustainability requirements within procurement processes for public buildings and infrastructure

¹. Not exhaustive
Case for change

**LACK OF SUSTAINABILITY-RATED CONSTRUCTION; BUILDINGS AND INFRASTRUCTURE ARE NOT ALWAYS RESILIENT TO NATURAL CALAMITIES**

In Malaysia, less than two per cent 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 limited enforcement contributes to a low take-up of sustainable practices.

Contrasting incentives mean that sustainability is often not top-of-mind when it comes to building and infrastructure solutions. While it is expected that sustainable solutions will have a lower lifecycle operational cost, investing in sustainability does typically require a higher upfront fixed cost. Often, this puts off parties that need to spend at the outset. Further, consumer psychology is often to discount future reductions in energy savings when purchasing property, in contrast to the upfront cost that is immediate. This is a primary reason why sustainability is often mandated around the world by countries to instil ‘responsible’ sustainable behaviours in a top-down manner.

There is currently no sustainable *infrastructure* rating tool in Malaysia to assess and preclude usage of materials and practices that are not aligned with sustainability. When it comes to *buildings*, there are a few in use (e.g., GBI, MyCREST among others), although sparsely. This relatively low adoption of ratings is partly due to the lack of a strategic push for alignment across the plethora of systems of assessment available.

Referring to Figure 22, less than two per cent of eligible projects are assessed with building rating systems such as the GBI, and even among those assessed, less than 50 per cent have been rated.

There is currently no mandate for projects to hire contractors with ISO 14000[^54] a certification for environmental management or its equivalent. Further, few Malaysian companies (only about 150 companies out of total of about 66k construction companies[^55]) currently possess the ISO 14000 certification.

[^53]: Department of Statistics, Malaysia; CIDB statistics (2014 project data – as of March 2015);
[^54]: International Organisation for Standardisation’s certification
[^55]: CIDB Malaysia
“An effective and efficient infrastructure is an essential component for a growing economy and the creation of jobs and prosperity. As such, we have a responsibility to establish the appropriate mechanisms for the resiliency and sustainability of our infrastructure.”
Spiro N. Pollalis / Director of the Zofnass Program at Harvard for Infrastructure Sustainability / Professor of Design, Technology and Management / Harvard Design School

As a result of the limited take-up of sustainability ratings, Malaysia’s buildings and infrastructure have limited adoption of sustainable materials and practices. This results in a built environment that is relatively less resilient to natural calamities. From the design stage, buildings and infrastructure often do not take into account the use of sustainable construction materials, flood mitigation systems and maintenance to mitigate the impact of natural calamities. Annually, Malaysia experiences heavy flooding and monsoon rain, which results in heavy damage to the built environment. In late 2014 especially, Malaysians witnessed the scale of the damage that can be caused by natural calamities. The resulting infrastructure damage, amounted to ~RM 2.9 Billion. For the floods in the East Coast in 2014 alone, the Government has spent approximately RM 800 Million for repair and reconstruction of schools, hospitals, and bridges. Long-term, viable changes need to happen to ensure that damage from natural disasters is minimised and our built infrastructure can endure into the future.

HIGH CARBON EMISSIONS AND ENERGY USAGE OF BUILDINGS

Malaysia’s CO₂-equivalent emissions are comparatively high, with the ratio of GDP:CO₂ among the lowest in the world. Malaysia’s GDP per CO₂ ton is $1,500 while it is $3,000 in Turkey and $3,700 in Singapore. In addition, Malaysia’s growth in CO₂ surpasses the growth in most emerging economies, at a rate of five per cent in Malaysia compared to 4.6 per cent in Indonesia and one per cent in the Philippines.

From the perspective of environmental responsibility, buildings are one of the key sources to reduce carbon emissions around the world. This is 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 consume 15 per cent of total energy and are a key contributor to greenhouse gas emissions (see Figure 23). Through its impact on the built environment, the construction industry will play a central role in improving resource efficiency to meet our international sustainability commitments.

Figure 23 Buildings in Malaysia are a key consumer of energy (2012)

Energy consumption: Residential and Commercial buildings consume 15% of total energy in Malaysia

Percentage of total energy use by sector, 2012

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total energy use</td>
<td>100%</td>
</tr>
<tr>
<td>Transportation</td>
<td>37%</td>
</tr>
<tr>
<td>Industrial</td>
<td>30%</td>
</tr>
<tr>
<td>Non-Energy</td>
<td>16%</td>
</tr>
<tr>
<td>Residential and Commercial</td>
<td>15%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>2%</td>
</tr>
</tbody>
</table>

56. Bloomberg, 20 January 2015
57. PEMANDU Announcement, 20 January 2015
58. International Monetary Fund, World Economic Outlook Database, UN Millennium Development Goals Indicators, 2010
59. The World Bank, 2010
The relatively low market demand for sustainable building solutions in Malaysia today has resulted in a correspondingly weak ecosystem for sustainability (e.g., suppliers, sustainability-certified contractors, and the likes). This will need to be addressed.

**HIGH VOLUME OF CONSTRUCTION AND DEMOLITION WASTE DUMPING**

The construction industry is typically a major waste generator. In the United Kingdom, for example, the construction and demolition sector is the largest contributor of waste, responsible for generating about 120 million tonnes of waste every year which is equivalent to around one third of all waste in the UK. In the European Union, construction and demolition waste accounts for approximately 25% - 30% of all waste generated. Of the 43.8 million tonnes of waste generated in Australia, 38% is from the construction and demolition sector, 29% from municipal sources and 33% from the commercial and industrial sector.

The Malaysian construction industry also generates a significant amount of waste, of which little is recycled. This construction waste adds to the problem of rapidly depleting capacity of landfills in Malaysia. In addition to that, instances of dumping by construction players has had a negative impact on the environment as well as on the living conditions of Malaysians. Among the challenges faced by Malaysian contractors in adopting sustainability practices are the limited promotion and guidance as well as enforcement and mandate from authorities, the lack of infrastructure for sorting, recycling and waste reuse and recovery, the perception that waste management is likely to increase operational costs, the limited awareness of the direct impact of construction waste, and the lack of knowledge of best practices for site waste management.

"Buildings account for some 40 per cent of global greenhouse gas emissions and I believe this is an issue that can be tackled effectively with modern technology. All our technologies are developed for the betterment of living and the reduction of society’s impact on the environment. I welcome all improvements on our environmental impact."

Mr. Patrick Thomas / Chief Executive Officer & Chairman of the Board / Bayer MaterialScience AG
Initiatives

CITP aims for Malaysia’s sustainable infrastructure to be a model for the emerging world (including rapidly-developing countries within and beyond ASEAN). Based on the three challenges outlined in the previous section, the CITP puts forward five initiatives as part of an integrated programme. Each initiative contributes to Malaysia’s goal of becoming a low-carbon, sustainable building and infrastructure hub and will collectively resolve the issues identified. This reflects the interrelated nature of ecological, social, and economic interests needed to meet the challenge of sustainability.
“Whilst we are talking about extending the serviceability of infrastructure, the present infrastructure industry is already plagued with many problems and challenges. There are many contributors to these problems, and without research, the immediate reasons and the more important root causes may not be identified and analysed. The nation needs to find remedies to ensure that the present and future construction industry do not further deteriorate the situation.

Research work is needed not only to elucidate the residing causes to the problems but more importantly to consequently suggest mitigation and solutions. As research will meet its impact potential only when the industry uses them, the formulation of research questions must be carefully selected so they have immediate industrial adoption.

Under the needed circumstance, a framework must define all the most necessary and immediate research attention. A custodian for such research coordination must exist and the Centre of Excellence will be playing the role.”

Professor Ahmad Farhan Mohd Sadullah / Universiti Sains Malaysia

**INITIATIVE E1**

**Drive innovation in sustainable construction**

A Centre of Excellence (CoE) for Sustainable Construction will be the “home” for driving sustainability in construction via a host of initiatives and functions. Its vision is to improve the lives of the Malaysian people by developing, promoting, and implementing sustainable construction systems and practices in Malaysia and beyond. Through its key focus areas, the CoE aspires to:

- Improve long-term **economic** sustainability;
- Improve **social** sustainability by preserving required resources for the society; and
- Improve **environmental** sustainability via protecting natural functions and the ecosystem.

The CoE will focus first on transforming infrastructure projects in Malaysia through the development and implementation of a sustainable infrastructure rating tool to raise awareness of and assess sustainability in the industry and across government. The CoE will promote sustainable best practices by providing training and will also be a hub for research on sustainable practices in construction, which will be done in partnership with leading global and local universities.
The sustainable infrastructure rating tool will be one of the first of its kind in not just Malaysia but in the emerging world. It is based on a rating tool (‘Envision’) and will be customised to the Malaysian context. Envision is the product of a joint collaboration between the Zofnass Program for Sustainable Infrastructure at Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure. The CoE will also lead the much-needed training on sustainability for assessors and industry players. The CoE will provide advisory services to guide infrastructure projects to ensure that they are able to comply with the stringent requirements to be rated as sustainable. This drive towards improving the levels of awareness of sustainability amongst the industry and government stakeholders, together with the research, advisory, and training activities, will raise Malaysia’s profile as a global citizen doing the right thing. At the same time, the ambition to extend the reach of the customised tool to other emerging economies around Asia in the longer run.

The CoE will host a pool of capable researchers to advance sustainability research in close collaboration with globally respected international institutions as well as key local partners that are focused on sustainability. It is expected that through close collaboration among industry, leading global and local institutions, a holistic sustainability agenda will be pursued effectively. With close industry ties and commitment to promoting sustainability, the CoE can help the Malaysian construction industry develop know-how and increase its potential to export services on sustainability. This will help the industry to become more active in a wider region.

Further, an important step in promoting sustainability in the construction industry is to raise the awareness and perception of the importance of sustainability for infrastructure, cities, buildings, and materials. The CoE will take on the responsibility of promoting best practices in sustainability and supporting capability development in sustainability across the industry value chain. The CoE plans to develop executive leadership programmes, in collaboration with globally renowned institutions, to train the next generation of leaders and professionals on topics of sustainability in order to advance the sustainability agenda across Malaysia. The expansion of these executive leadership programmes, beyond construction industry players, CIDB, MOW and its agencies, is important to ensure that all levels of government and industry are bought into the idea and can work towards greater sustainable development. Further, the CoE plans to enhance awareness of sustainability among industry players and important stakeholders, offering Malaysia-based training and education courses on sustainability at an affordable rate.

In summary, the outcomes expected to drive sustainable excellence include the development of a sustainability rating tool that will be customised to the Malaysian context, and the certification of trainers that are able to drive the implementation of sustainability rating tools. In addition, comprehensive research partnerships between global and local universities, as well as joint industry advisory projects are expected to be formed. These partnerships and collaborations are aimed at leading and implementing innovative practices in sustainable construction methods.

Developments such as green buildings will be a key opportunity for growth in Malaysia. For construction industry players, there is a growing commercial proposition for constructing green assets. As globalisation continues to open new markets, Malaysia has successfully attracted international companies to invest in Malaysia. Many of these international firms bring their business practices, which include requirements on sustainability, and apply them in Malaysia. For example, international companies looking for office space to house their headquarters may base rental agreement pricing on an office development’s sustainability ratings and may stipulate a minimum performance level.

Given the importance of environmental sustainability as a market driver and platform for growth, it will be critical to ensure a comprehensive suite of sustainability ratings systems is available in Malaysia. CITP recommends the alignment of existing building rating tools or systems (e.g., MyCREST, BCA Green Mark, bream, and the likes) and the development of an infrastructure rating tool for Malaysia. Beyond that,
to drive adoption of these rating tools and to encourage compliance to minimum sustainability standards, it is recommended that sustainability ratings are required for large public projects. In addition, rating tools are proposed to be included in the recommended annual report disclosure criteria for publicly-listed companies. Financial institutions will also be recommended to include sustainability ratings as a requirement in project financing. At the same time, internationally-recognised environmental management certifications (e.g., ISO EMS 14001) will be made a prerequisite for G8 qualification and mandated for large public projects.

**Alignment with national programmes**

Initiatives E1 and E2 contribute to the fourth strategic thrust of RMK11: ‘Pursuing green growth for sustainability and resilience’. The development of a rating tool will contribute to the RMK11 goal of strengthening governance to drive transformation by enhancing regulatory and institutional framework, coordination, capacity as well as monitoring and evaluation mechanisms. Further, the CoE will help to enhance awareness to create shared responsibility by setting up a platform for knowledge sharing and collaboration\(^{62}\). The CoE will also drive adoption of sustainability in infrastructure projects, which will in turn contribute to the RMK11 goal to strengthen resilience against climate change and natural disasters\(^{63}\). Incorporation of environmental sustainability in infrastructure design will include elements such as improved flood mitigation measures\(^{64}\). RMK11 also emphasises the need to enhance adaptation to climate change, including by building resilient infrastructure that supports the use of renewable energy and a reduced dependency on non-renewable natural resources\(^{65}\).

**Highlighted roles of key stakeholders\(^{66}\)**

Support will be required from key stakeholders including the Zofnass Program for Sustainable Infrastructure at Harvard University, USM, and the likes. Scope of support will include the identification and launch of a new research platform on sustainability. Experts will be engaged to construct and customise Envision to the Malaysian context and to launch the ‘MyEnvision’ training function. Further, collaboration will be needed to develop a geotechnical engineering lab to house centrifuge facility and to provide advisory services for large projects that require geotechnical engineering simulation and modelling to support environmentally sustainable construction. Regulators and clients will also need to collaborate to include sustainability ratings and environment management certifications (e.g., ISO EMS 14001) as a requirement for large projects.

CIDB will launch the CoE for sustainable construction, which will promote and pilot the application of the Envision rating system. It will also align existing building and infrastructure sustainability rating systems in Malaysia to ensure comprehensiveness and consistency, as well as drive adoption of sustainability rating systems for both buildings and infrastructure. CIDB will also include environment management certifications (e.g., ISO EMS 14001) eventually as a requirement for G8 qualification.

**INITIATIVE E3**

**Focus on public projects to lead the charge on sustainable practices**

Governments can play an important role in driving sustainability. The construction industry needs to encourage higher sustainability requirements for public works and leverage the Malaysian government’s position as its key client to influence the development of sustainable construction. The CITP will raise sustainability standards for construction, with a focus on public projects to improve its procurement specifications, resource allocation, and resource performance.

It is recommended under the CITP that sustainability requirements be introduced for key public projects. The CITP recommends changes in public sector procurement to increase sustainability elements in its specifications and Bill of Quantities\(^{67}\) in line with sustainability rating tools. This requires defining minimum standard sustainability requirements for common public projects, then piloting it with high profile projects to demonstrate the financial and technical viability of sustainable developments. There is also a recommendation to ensure that training is provided for project managers on the new standards and requirements. Publishing the learning from different projects is also recommended to further extend adoption by both public and private sector projects.

---

61. New category of high performing players to be introduced and described in Initiative Q3
62. Strategy A2, Focus area A, Chapter 6, 11th Malaysia Plan
63. Focus area D, Chapter 6, 11th Malaysia Plan
64. Strategy D2, Focus area D, Chapter 6, 11th Malaysia Plan
65. Strategy D3, Focus area D, Chapter 6, 11th Malaysia Plan
66. List of stakeholders and roles is not exhaustive
67. A document used in tendering in the construction industry in which materials, parts, and labour are itemised
It is necessary to establish and enforce a standard assessment framework for sustainability that is comprehensive in coverage for both buildings and infrastructure across different types of projects and scope of assessments. It must be internationally viable and industry accepted. Thus, the definition of “good and sustainable performance” should be standardised and widely understood by all players. With this in mind, the CITP recommends sustainability requirements and adoption of rating tools within government procurement. And as mentioned earlier, to raise private sector take-up, CITP recommends the disclosure of sustainability certifications and practices at time of listing and for annual reporting. In addition, banks and financial institutions are encouraged to recommend sustainability to their clients as part of the condition for financing. Finally, it is recommended that the new proposed G8\textsuperscript{68} category of leading construction industry players demonstrate adherence to sustainability certifications and practices.

Benchmark 4

PUBLIC WORKS IN THE UK TO RAISE SUSTAINABILITY

The UK government leverages public works spending to embed sustainability in construction. Its objective is to provide demand certainty that is needed for companies to invest in new sustainable skills, processes and products. Leading by example, the government has set up proof-of-concepts for the private sector, providing scale in the usage of newer technology that leads to greater innovation and lower costs, thus providing case studies for investment returns.

The UK government has also published committed spending for buildings with mandated sustainability requirements. The government has proposed that by 2016, all public projects are to use Government Soft Landings or GSL (powered by Building Information Modelling (BIM) as described in Initiative P4.) and all new residential homes built are to be zero carbon and by 2019, all non-domestic buildings built are to be zero carbon. GSL is a key element of the design and construction process to ensure a smooth transition from the design and construction phase to the operational phase of a built asset. GSL recognises the need to identify ongoing maintenance and operational costs that outweigh the original cost of capital through early engagement with operational aspects during the design stage, allowing for a fuller picture of the lifetime cost and pave the way for adoption of sustainable practices.

An effective example that demonstrates the incorporation of BIM and GSL in the UK is the sustainability of the UK Olympic Park that was a key deliverable of the Olympic Delivery Authority, which supported and used existing recognised sustainability rating tools such as CEEQUAL and BREEAM. The lessons learned on products and technology used, economics, costing and case studies have also been published and promoted through the “Learning Legacy” campaign.

Sources:

\textsuperscript{68} New category of high performing construction players to be introduced and described in Initiative Q3
Alignment with national programmes
These initiatives contribute to the fourth strategic thrust of RMK11: ‘Pursuing green growth for sustainability and resilience’. Specifically, Government Green Procurement (GGP) is a key strategy within this thrust. GGP will create demand from the public sector for green products and services, encouraging a rise in industry standards to meet sustainability requirements. Further, the development of environmentally sustainable specifications is in line with the strategy that new government buildings will adopt green features and designs and measures such as to improve flood mitigation.

Highlighted roles of key stakeholders
Support will be required from key agencies including EPU, KeTTHA, client ministries environmental sustainability experts, and the likes. Scope of support includes demonstrating environmental sustainability specifications via a pilot project before including sustainability specifications in procurement or standard contract for common public buildings and infrastructure for key ministries.

CIDB will also contribute by participating in the working group to define sustainability requirements for procurement of common public buildings and infrastructure. CIDB will drive a study to determine the baseline CO₂ emissions by public buildings. Beyond that, CIDB will support adoption of environmentally sustainable specifications by providing training for consultants and project managers on new specifications.

E4 INITIATIVE E4 Facilitate industry adoption of sustainable practices
The CITP recommends appropriate mechanisms and incentives be put up in order to facilitate private sector adoption of environmentally sustainable development. These incentives can include both financial and non-financial incentives which accelerate progression towards environmentally sustainable development. An example of a non-financial incentive is accelerated or expedited approvals, such as the benchmark example in San Diego, or for construction permit issuance for projects with high sustainability elements in the specifications.

In order to effectively incentivise sustainable developments, types of developments to facilitate sustainability will need to be defined, followed by defining the extent of the incentives (financial and non-financial) by performing economic and Return on Investment (ROI) analyses. A disbursement mechanism will then need to be designed in order to maximise impact. Examples where these financial incentives have been successful include the Green Deal in the United Kingdom and the Brownfield Tax in the United States.

Benchmark 5

EXPEDITED APPROVALS OF SUSTAINABLE PROJECTS IN SAN DIEGO
The city of San Diego in the United States has been using expedited approvals to incentivise sustainable housing and building constructions since March 2013. This initiative involves sustainable buildings, residential, commercial and industrial development projects. It provides expedited permit processing for all eligible affordable or in-fill housing and sustainable building projects. This is performed through aggressive processing timelines achieved by providing mandatory initial review meetings for early staff feedback. In addition, a public hearing for final approval can be requested at the applicant’s behest.


69. Strategy B1, Focus area B, Chapter 6, 11th Malaysia Plan
70. Strategy D2, Focus area D, Chapter 6, 11th Malaysia Plan
71. List of stakeholders and roles is not exhaustive
Benchmark 6

BROWNFIELD TAX IN THE UNITED STATES

The United States Federal Government introduced the Brownfield Tax Incentive to encourage the cleanup and reuse of brownfields. This incentive was introduced in 1997 and was phased out in 2011. It involved both large and small scale cleanup and redevelopment projects – from large office buildings to small commercial strips. Via this incentive, environmental cleanup costs were fully deductible in the year that they were incurred (rather than capitalised over time). There are three key requirements to qualify for this incentive: the property owner must be undertaking the expenses, hazardous substances must be present, and the brownfield status of development must be verified by the designated state agency.

Source: Brownfields and Land Revitalisation, United States Environmental Protection Agency (EPA) website. [http://www.epa.gov/brownfields/tax/]

In order to guide energy conservation during construction, it is recommended that energy monitoring and conservation guidelines be developed for construction players. It is recommended that an enhancement of the National Energy Efficiency Action Plan (NEEAP) be undertaken through the development of a construction-specific module to reduce energy and carbon usage. The module will include guidance on elements of design that take environmental sustainability and energy use of a building throughout its lifecycle into account.

Since the majority of the 15 per cent of energy usage contributed by residential and commercial buildings in Malaysia (as shown earlier in Figure 23) comes from electricity usage, these recommendations will help to achieve the NEEAP overall target of reduced growth in electricity demand. It is further recommended that a carbon reduction scheme be devised and a mechanism be designed to monitor energy usage and carbon reduction progress by construction players. The scheme will be piloted with selected large G7 and with the proposed G8^72 construction industry players based on a guidance and support programme. Through this initiative, construction players will be incentivised to invest in carbon and energy reduction technologies and adopt sustainable practices. This will steer Malaysia in the direction of becoming a low carbon, sustainable building and infrastructure hub. The findings can also be published for greater adoption in the industry.

“Environmental sustainability has always been a central theme of Fosters + Partners’ work. Using both traditional passive measures and active technological solutions, all our buildings are a unique response to local culture and climate. The form of the Universiti Teknologi Petronas follows the site’s undulating topography, with its flowing canopy sheltering users from the intense tropical heat and rain. More recently, at The Troika we used prefabricated construction techniques to reduce on-site waste, and the Ilham Baru Tower, KL employs high-performance glazing and diagonal brise-soleil across each façade, orientated specifically to reduce solar heat gain.”

Luke Fox / Senior Partner / Foster + Partners

72. New category of high performing construction players to be introduced and described in Initiative Q3
“We believe that the fundamental technology platforms of building landed and low rise residential homes should be reviewed and transposed onto the framework of prefabrication technology. Aspects of construction design will definitely need to interface seamlessly with the functionalities of technology in relation to energy systems, indoor air quality, security, communication, storages, modular fittings and various attributes essential to living standards of today and beyond.”

Mr. Cheng Chee Chung / Managing Director / Panasonic Malaysia Sdn Bhd

Alignment with national programmes
These initiatives contribute to the fourth strategic thrust of RMK11: ‘Pursuing green growth for sustainability and resilience’. Recommended economic mechanisms to spur industry adoption of sustainable development are aligned with the RMK11 to establish sustainable financing mechanisms such as green tax and carbon tax\textsuperscript{73}. Further, RMK11 stresses the need to enhance demand side management of environmental sustainability. Under this strategy, the government seeks to identify potential improvements to ensure efficient use of energy in buildings, industries and household so as to reduce demand for energy\textsuperscript{74}.

Highlighted roles of key stakeholders\textsuperscript{75}
Support will be required from key agencies including KeTTHA, MOF, industry players, and the likes. Scope of support will include conducting an economic analysis on impact of energy savings and tax exemption to determine appropriate level of incentives. Further, collaboration will be needed to define the scope of investments to be covered under tax exemption and to launch a sustainable development incentive programme. Stakeholders will need to work together to pilot KeTTHA’s National Energy Efficiency Action Plan (NEEAP) for large construction players.

At the same time, CIDB will ensure participation in the initiative working group to refine incentive programmes to be offered. In parallel, CIDB will provide training and accreditation to contractors, developers, consultants and various other stakeholders and will improve awareness of energy and electricity usage of buildings with large construction players and guide efforts to conserve energy during construction.

---

\textsuperscript{73} Strategy A3, Focus area A, Chapter 6, 11th Malaysia Plan
\textsuperscript{74} Strategy B3, Focus area B, Chapter 6, 11th Malaysia Plan
\textsuperscript{75} List of stakeholders and roles is not exhaustive

Benchmark 7

GREEN DEAL IN THE UNITED KINGDOM

The United Kingdom encourages energy efficiency via its Green Deal, which aims to enable investments in energy efficiency measures for home owners. The Green Deal currently targets residential buildings, and there are plans to expand coverage to commercial buildings in 2018. The finance mechanism allows consumers to install energy efficiency measures at no up-front cost. Loan repayment is made through achieved savings on energy bills. The Green Deal is likely to be supplemented with additional incentives being considered such Variable Stamp Duty, Variable Council Tax and Energy Efficiency Feed in Tariffs.

Source:
Green Deal UK (http://www.greendeal.co.uk/)
MALAYSIA’S NATIONAL ENERGY EFFICIENCY ACTION PLAN (NEEAP)

The National Energy Efficiency Action Plan (NEEAP), developed by the Ministry of Energy, Green Technology and Water (KeTTHA), outlines a strategy for a well-coordinated and cost-effective implementation of energy efficiency measures, confined only to electricity usage, across three sectors: industrial, commercial and residential.

Within the NEEAP, there are 17 specific energy efficiency programmes covering the three sectors to be implemented over a 10 year period. The programmes can be grouped into five key initiatives related to the design of the programmes:

- Initiative 1: Rating and labelling of appliances;
- Initiative 2: Minimum Energy Performance Standards (MEPS);
- Initiative 3: Energy Audits and Management in Buildings and Industries;
- Initiative 4: Targeted “Kick Start Promotion Bonus” and support programmes.

The overall target of the NEEAP is to save electricity and reduce electricity demand growth. According to the January 2014 NEEAP draft report, effective and efficient implementation of the NEEAP is expected to save up to ~51,000 GWh of electricity over the 10-year plan period against a business-as-usual (BAU) scenario, with an electricity demand growth reduction of 6.0% at end of the period. An ROI of 1.4x has also been calculated for the NEEAP, with returns measured by monetary savings driven by value of total electricity saved based on current electricity tariffs.

Sources:
Case Study 4

LEADING ENVIRONMENTAL SUSTAINABILITY EFFORTS THROUGH SP SETIA’S FLAGSHIP PROJECTS

SP Setia is a leader in its field, both within the infrastructure / construction industry following its 6-time FIABCI Prix d’ Excellence Awards (awards for projects that embody excellence in real estate disciplines) and also in terms of its efforts to spearhead environmental sustainability within the Malaysian construction industry.

SP Setia’s efforts to champion environmental sustainability are evident in its major flagship projects, namely Setia Greens, Setia Eco Park and Setia Eco Glades. Setia Greens is a residential project located in Penang that heavily utilises environmentally-friendly technologies in homes. For example, Setia Greens’ homes deploy the Cool Roof, Solar Water Heater, Rainwater Harvesting system, water efficient fittings and low volatile organic compound (VOC) paint in its development. Each of these technologies contribute to the betterment of the environment – for example, the water-efficient fittings in all sanitary wares and plumbing fittings (except in the kitchen) such as the water closet, basin tap, shower head, hand bidet, mixer for long bath and rain shower facilitate the reduction of water flow rate, which indirectly reduces water usage.

Setia Eco Park is a 791-acre swathe of land developed by SP Setia. Recognised Eco advisers have been engaged to drive a sustainable landscape that feature a specially-created tropical landscape that serves as an ideal habitat for a plethora of flora and fauna. Setia Eco Park has collaborated with Penang Butterfly Farm to sustain the existing resident species whilst introducing new species of butterflies at the Eco Park to increase species diversity. Additionally, the ‘Green Street’ concept has also been espoused where all telephone, electrical and other utility cables are laid underground and out of sight.

Sources:
Case Study 4 (cont’d)

On top of that, Setia Eco Park has the largest building-integrated photovoltaic (BIPV) capacity within a residential area, with 1.6 mw of solar energy generation for sustainable use of inexhaustible power resources for the community. Setia Eco Park installed the BIPV to generate renewable energy which are channelled to the national grid with the principal aim to protect the environment through reducing climate change and greenhouse gas emissions.

Setia Eco Glades is one of the latest additions to the booming Cyberjaya, developed based on the Setia Eco Park master plan with residential and commercial units surrounded by lush greenery and waterways. It is encircled by 8 unique fountains and 8 islands where the residences fronting those waterways will enjoy an island resort environment every day. Setia Eco Glades is also designed in such a way that it will help towards minimising the effects of global warming. To date, a total of 2,000 grown trees and 3,000 saplings have been successfully transplanted, making it possibly the world’s largest transplanting and rehabilitation task undertaken by a property developer. Approximately 160 tons of CO₂ is reduced annually due to this effort.

To reflect on its commitment to sustainability, SP Setia pursued the highest green rating for its Corporate Headquarters located in Setia Alam, and was accorded the Green Building Index (GBI) Platinum rating, making it the first private sector corporate office and only the third building in Malaysia to have achieved this rating. Setia City Mall is also the first green retail mall to have received the Singapore’s Building and Construction Authority (BCA) Green Mark Gold Award. It was designed to save energy and water with provision of green car park bays amongst its other green features.

SP Setia’s strong focus on environmental sustainability in its flagship projects have garnered recognition both locally and internationally and has positioned SP Setia as a Malaysian champion for the built environment.

Sources:
1. SP Setia (http://www.spsetia.com.my/)
2. Setia Ecopark (http://www.setiaecopark.com.my/)
INITIATIVE E5
Reduce irresponsible waste during construction

It is recommended that construction players enhance their waste efficiency and waste management practices. This will require construction players to improve material planning practices to minimise wastage and increase the rate of reusing and recycling. For example, waste separation and categorisation at the site enables contractors to identify whether valuable waste is to be reused on-site or is to be sent for recycling, thus reducing the amount of waste to be transported for disposal. It also improves the safety of the construction site. Overall, this helps to minimise the cost incurred in wasted materials while helping to minimise landfill contributions, thus reducing carbon emissions and improving the environment. Additionally, usage of construction technology such as Building Information Modeling (BIM) software integrates the planning, design and construction process and improves the accuracy of planning and collaboration across the construction value chain, thus reducing time and material wastage by greatly improving the speed and quality of construction. This improves both the productivity and environmental sustainability of construction.

In particular, in order to reduce waste generation on-site, it is recommended that a Site Waste Management Plan (SWMP) template be developed and distributed to industry players for adoption, such as is implemented in the United Kingdom. In order to heighten enforcement against illegal dumping, it is recommended that SWMP submission be made a requirement for large projects.

Further, it is recommended that land-fill taxation mechanisms be devised in order to penalise excessive waste generation and nudge players towards a low-waste generation culture. Such an approach has been successful in the United Kingdom. In addition, a licensing scheme is to be developed for waste transporters. To facilitate recycling of construction and demolition waste, it is recommended that dedicated recycling plants for construction and demolition (C&D) waste be established in collaboration with private sector landfill operators, as in the model applied through collaboration between KPKT (JPSPSN), DBKL and Worldwide Holdings in Sungai Kertas, Selangor. This model can be replicated with other landfill operators. The construction of

---

Benchmark 8

GUIDANCE AND PENALTIES ON POOR WASTE MANAGEMENT IN THE UNITED KINGDOM

Practices in the United Kingdom demonstrate the importance of guidance and penalties in waste management. The Waste and Resource Action Programme (WRAP) has produced generic Site Waste Management Plan (SWMP) templates for use by industry in construction projects.

As of April 2008, a Basic Site Waste Management Plan needs to be submitted as a mandatory requirement for projects with a value in excess of £250,000, and Detailed Site Waste Management Plans need to be submitted for all projects in excess of £500,000. In addition, there is also a voluntary assessment standard, the Code for Sustainable Homes, which prescribes requirement of Site Waste Management Plans.

To further encourage the adoption of sustainable practices amongst industry players, the government has introduced the Landfill Tax since 1996. It is aimed at reducing the volume of waste disposed in landfills. Such regulatory measures demonstrate the applicability of financial disincentives that may be used to facilitate changes amongst industry players.

Sources:
2. Achieving good practice Waste Minimisation and Management – guidance for construction clients, design teams and contractors

---

A recycling plant can be a business opportunity for landfill operators given its revenue-generating nature. CITP encourages the procurement of construction-specific material recycling equipment for recycling of construction and demolition waste by providing matching grants to recycling centres investing in such equipment.

Private sector participation can be incentivised to construct the C&D recycle centres or to set up supportive policies in order to recommend or require the use of part-recycled construction materials for some portion of the construction of major projects. Such rigorous regulations and enforcement of policy has been successful in countries like Japan.

**Alignment with national programmes**
Initiative E5 contributes to the fourth strategic thrust of RMK11: ‘Pursuing green growth for sustainability and resilience’. Adoption of Site Waste Management Plans among construction industry players is aligned with RMK11’s focus to manage waste holistically. Recommendations in the CITP and RMK11 are closely aligned in their emphasis to manage waste through measures beyond disposal of waste and looks to improve management of landfills to reduce the amount of waste and pollution.

**Highlighted roles of key stakeholders**
Support will be required from key agencies including KPKT, Jabatan Pengurusan Sisa Pepejal Negara (JPSPN), The Solid Waste Management and Public Cleansing Corporation (SW Corp), KeTTHA, Local Authorities, MOF, industry players, and the likes. Scope of support will include enhancing a site waste management plan template for construction industry players to use. Stakeholders need to come together to phase-in a construction landfill tax in priority areas, such as those with high levels of construction activity. A concerted effort will be needed to improve enforcement against illegal dumping, in line with Solid Waste and Public Cleansing Management Act 2007 via waste management licensing scheme and to include submission of Site Waste Management Plan to Local Authorities as requirement for approval for large projects.

CIDB will also contribute by conducting a study to determine the baseline of landfill waste generated by construction industry. Key stakeholders will also stimulate recycling by facilitating equipment procurement for construction and demolition recycling in priority areas and by amending policies to allow for use of recycled materials in construction.

---

77. List of stakeholders and roles is not exhaustive
Lack of sustainability-rated construction; Buildings and infrastructure are not always resilient to natural calamities

- No clearly articulated, overarching policy and holistic regulations that require sustainability ratings and assessments
- Limited availability of comprehensive rating tool to assess and preclude usage of materials and practices that are not congruent with sustainability
- Lack of mandate and focus on sustainability, with limited number of companies certified in environmental management

Drive innovation in sustainable construction
- Develop, promote and implement sustainable construction systems and practices in Malaysia
- Introduce sustainable infrastructure rating tool that is customised to the Malaysian context
- Host a pool of capable researchers to advance sustainability research in close collaboration with globally respected institutions
- Sustainability rating tool and assessment to be recommended for public projects

Drive compliance to environmental sustainability ratings and requirements
- Standardise existing sustainability rating tools
- Sustainability rating tool recommended for large public projects
- Sustainability rating tool included in annual report disclosure criteria
- Environmental management certifications included in G8 qualification
- Environmental management certifications included as requirement for large public project

Key outcomes by 2020
- Rating tool constructed and customised to Malaysian context
- Pool of qualified rating tool trainers certified and tasked to drive the rating tool’s implementation
- Comprehensive research partnerships between global and local universities formed on leading sustainability research
- Joint industry advisory projects implemented
- Rating tool adopted by large public infrastructure projects

Use of sustainability rating tools disclosed in annual reports of publicly listed companies
- Large development projects measured on sustainability ratings
- Sustainability rating methodology certified
- Leading construction companies with large project values certified in environmental management

Key stakeholders:
The Zofnass Program for Sustainable Infrastructure at Harvard University, USM, and the likes

Scope of support:
- Identify and launch of a new research platform on sustainability.
- Collaborate to develop a geotechnical engineering lab to house centrifuge facility and to provide advisory services for large projects that require geotechnical engineering simulation and modelling to support environmentally sustainable construction
- Regulators and clients will also need to collaborate to adopt sustainability ratings and environment management certifications

Case for change

Initiatives

Key outcomes by 2020

Highlighted roles of key stakeholders
Lack of sustainability-rated construction; Buildings and infrastructure that are not always resilient to natural calamities (cont'd)

Focus on public projects to lead the charge on sustainable practices

- Define minimum standard sustainability requirements for common public projects
- Pilot key projects to demonstrate financial and technical viability of being environmentally sustainable
- Provide training to project managers on new sustainability standards and requirements
- Emphasise improvements in procurement specifications, resource allocation, and resource performance for all public projects

Key outcomes by 2020

- Sustainable specifications mandated in the procurement of common public buildings / infrastructure
- CO₂ emission by public buildings and infrastructure measured and baselined
- CO₂ emissions in new and retrofitted public buildings significantly reduced

Highlighted roles of key stakeholders

- Key stakeholders: EPU, KeTTHA, client ministries, environmental sustainability experts, and the likes
- Scope of support:
  - Demonstrate environmental sustainability specifications via a pilot project prior to inclusion of sustainability specifications in procurement or standard contract for common public buildings and infrastructure for key ministries.
- CIDB role:
  - Define sustainability requirements for procurement of common public buildings and infrastructure.
  - Drive a study to determine baseline CO₂ emissions by public buildings.
  - Support adoption of environmentally sustainable specifications by providing training for consultants and project managers on new specifications

Not Exhaustive
Four Strategic Thrusts

**Case for change**

High carbon emissions and energy usage of buildings
- High CO₂-equivalent emissions, with GDP: CO₂ ratio among the lowest in the world
- Built environment large consumer of energy

Facilitate industry adoption of sustainable practices
- Introduce both financial and non-financial incentives to accelerate progression towards environmentally sustainable development
- Develop energy monitoring and conservation guidelines
- Devise and pilot a mechanism to monitor energy usage and carbon reduction progress by construction players

Initiatives

- Construction module of energy conservation guides piloted
- Sustainability development incentive programme launched
- Selected large value projects launched and benefited from the sustainable development incentive programme

Key outcomes by 2020

- Key stakeholders: KeTTHA, MOF, industry players, and the likes
- Scope of support:
  - Collaborate to define the scope of investments to be covered and to launch a sustainable development incentive programme
- CIDB role:
  - Ensure participation in the initiative working group to refine incentive programmes to be offered
  - Provide training and accreditation to contractors, developers, consultants and various other stakeholders to improve awareness of energy and electricity usage of buildings
  - Guide efforts to conserve energy during construction

Highlighted roles of key stakeholders

- Key stakeholders: KeTTHA, MOF, industry players, and the likes
- Scope of support:
  - Collaborate to assess the economic impact of energy savings potential incentives that can be offered
  - Enhance a site waste management plan template for construction industry players to use
- CIDB role:
  - Determine baseline of landfill waste generated by construction industry
  - Collaborate with key stakeholders to facilitate equipment procurement for construction and demolition recycling in priority areas and by amending policies to allow usage of recycled materials in construction

**High volume of construction and demolition waste dumping**
- Construction industry a significant generator of waste, with relatively low levels of recycling
- Lack of regulatory and operational frameworks for responsible waste management

Reduce irresponsible waste during construction
- Develop and distribute site waste management plans to industry players for adoption
- Devise landfill taxation mechanisms in order to penalise excessive waste generation
- Encourage building of construction-specific recycling centres

- Significant reduction in construction / demolition waste volume to landfills achieved
- Significant increase in construction and demolition waste volume recycled
- A minimum number of C&D recycling plants equipped with construction-specific recycling equipment

- Key stakeholders: KPKT, JPSPN, SW Corp, KeTTHA, local authorities, MOF, industry players, and the likes
- Scope of support:
  - Enhance a site waste management plan template for construction industry players to use
- CIDB role:
  - Determine baseline of landfill waste generated by construction industry
  - Collaborate with key stakeholders to facilitate equipment procurement for construction and demolition recycling in priority areas and by amending policies to allow usage of recycled materials in construction

Not Exhaustive
Environmental sustainability calls for compliance with environmentally sustainable practices in order to showcase Malaysia as a low carbon, sustainable building and infrastructure hub. Irresponsible dumping of construction and demolition waste as well as damage and repair expenditure after natural disasters are key issues to be addressed.
4.3 PRODUCTIVITY

The CITP aims to increase productivity by two-and-a-half times, which corresponds to a target value-add of USD 16,500 per worker\textsuperscript{78}. This more than doubling of productivity will be equally matched by higher wages within the construction industry. Increasing productivity – either by enabling for higher output from the same inputs or by producing the same output from fewer inputs – is in line with the nation’s high-income goal.

Three key drivers underpin the productivity in the construction industry: workforce, technology and processes. The workforce driver relates to human capital improvements to increase output per worker. The technology driver relates to how technology can increase the production frontier and raise efficiency, while the process driver relates to how processes can be made more efficient and effective through better planning and management.

Today, six productivity-related issues still plague the construction industry and need to be addressed:

- Largely low-skilled workforce and inadequate or mismatch in training and development
- Over-reliance on low-skilled foreign labour
- Limited adoption of modern practices, mechanisation and IBS
- Limited adoption of information technology such as BIM
- Lack of data and information-driven decision-making
- High proportion of subscale SMEs, including Bumiputera SMEs and entrepreneurs

The CITP aspires to tackle these issues head-on with six specific productivity-related initiatives:

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

\textsuperscript{78} USD16,500 is equivalent to RM 61,939 as stated in the 11th Malaysia Plan; 2.5x increase uses 2011 as a base as compared to 11th Malaysia Plan where 1.6x increase in labour productivity uses 2015 as a base. Both sets of numbers are consistent
PRODUCTIVITY

OUTCOMES

More than doubling productivity, matched by higher wages

2.5x

increase in productivity to US$16,500\(^1\) per worker

Productivity contributes to the High Income goal by enabling higher output from the same inputs, or the same output from fewer inputs

Measure for productivity is the average value in RM contributed by each worker

CASE FOR CHANGE\(^2\)

High proportion of subscale SMEs and Bumiputera firms

- ~90% of contractors are SMEs
- ~56% of firms are Bumiputera

Enhance human capital development

- Drive targeted training and Specialist Apprenticeship programmes
- Accredit workers, contractors and personnel
- Increase skill level and specialisation

Drive scale of IBS adoption

- Establish economic mechanisms, e.g., equipment tax reduction, tax holidays, plot ratio incentives, etc.
- Separate IBS procurement from main contract

Increase capability of Bumiputera contractors

- Develop Bumiputera contractors with expertise in Specialist trades
- Enhance holistic upskilling and develop more entrepreneurs
- Increase opportunities through “carve-out and compete” programme

Low Industrialised Building System (IBS) adoption rate

Only 24% of target projects worth > RM 10 Mn achieved 70 IBS score despite MOF circular

Largely unskilled workforce

~93% of foreign workers unskilled

---

1. US$16,500 is equivalent to RM 61,939 as stated in the 11th Malaysia Plan; 2.5x increase uses 2011 as a base whereas 11th Malaysia Plan states 1.6x increase in labour productivity using 2015 as a base, thus they are consistent; At 2005 constant value
2. Not exhaustive
Case for change

LARGELY LOW-SKILLED WORKFORCE AND INADEQUATE OR MISMATCH IN TRAINING AND DEVELOPMENT

Training and development of construction workers and personnel in the construction industry has much room for improvement. This is evidenced by the large proportion of low-skilled workforce in the industry. There are four likely reasons as to why the low-skilled workforce issue persists:

- Employers may be unwilling to invest in the up-skilling required for their workforce
- Gaps in modules for training of skills along the construction value chain, especially given the need to match the constant shifts in the global construction sector into more advanced use of technologies (e.g., IBS, BIM and the likes.)
- Need for a larger number of quality trainers and training modules for higher skill levels
- Lack of detailed manpower planning specific to the construction industry, especially one that provides a forward-looking view to allow for resource allocation and preparation

The short term financial benefits to the industry of hiring lower cost foreign construction workers have also directly led to the increasing pool of a largely less-skilled workforce.

OVER-RELIANCE ON LOW-SKILLED FOREIGN LABOUR

A large proportion of the construction workforce consists of low skilled foreign labour. While Malaysia employs on average 13 per cent foreigners, the construction industry employs 25 per cent registered foreign labour (see Figure 24). The low wages of foreign labour reflects their low skill levels.
Additionally, locals often have negative perceptions of the industry and perceive it as a challenging industry to work in, with limited career progression. This has resulted in relative reluctance among locals to work in the industry, especially, in the wet trades (e.g., bricklaying and plastering trades). Due to the shortage of labour, some of these skilled trades are eventually taken up by foreign workers, who are mostly registered as general workers and are under-equipped to fulfil these jobs. As shown in Figure 25, 93 per cent of registered foreign construction personnel are general workers with few or no skills.

Given the short-term financial benefits of hiring low-cost unskilled foreign labour, there is often little incentive for the industry to adopt practices that will drive productivity in the longer term, such as investing in workforce development and technology adoption. The reluctance of the local workforce to participate in the construction industry, paired with the industry’s tendency to employ low cost foreign labour perpetuates the industry’s low productivity levels.

**LIMITED ADOPTION OF MODERN METHODS, MECHANISATION AND IBS**

The construction industry records low productivity levels relative to other sectors in Malaysia, as shown in Figure 26. Global benchmarks also indicate that Malaysia’s construction sector is at the lower end of the productivity spectrum as shown in Figure 27. The relatively low productivity is a reflection of limited modernisation of construction methods and practices as well as the reliance on low-skilled labour.

---

81. Department of Statistics, Malaysia 2013
82. Department of Statistics, Malaysia, 2013
Malaysia still has a low take-up rate of Industrialised Building Systems (IBS) in construction. IBS refers to a technique of construction whereby building components are manufactured in a controlled environment, either on-site or off-site, and then installed or erected into construction works. This method of construction has many benefits, including:

- Accelerated construction stages considering that manufacturing of prefabricated elements in factories and construction of building foundation work at site could occur simultaneously before on-site erection of IBS components take place
- Higher quality of construction given the sheltered and controlled environment in which prefabricated elements are manufactured
- Safe environment on-site, as temporary works are minimised
- Cost savings with the repeated use of standardised IBS components with site material wastage minimised

With these benefits, significant efforts have been in place to push IBS adoption. IBS has been a strong agenda propounded by YAB Prime Minister of Malaysia as evidenced by the government’s commitment to deploy IBS for 34 schools in Sabah and Sarawak with further consideration to expand its usage. However, these efforts have yet to yield sufficient impact and the adoption rate is still low. The IBS roadmap 2011-2015 targeted an overall adoption rate of 100 per cent of projects with 70 IBS score for public sector projects, and 50 IBS score for private sector projects. In reality, IBS adoption is still relatively nascent and the target has yet to be reached. Only 24 per cent of public projects worth RM 10 Million and above have achieved IBS score of 70.\(^3\)

Figure 28 describes some of the issues faced in the adoption of IBS including the following:

- **Definition:** The current definition of components qualifying as IBS is vague and there is a lack of standards for IBS components
- **Cash flow:** Contractors who are awarded IBS contracts face cash flow issues during procurement of IBS components. IBS manufacturers typically require payment of large deposits upfront before components are delivered to the project site. Contractors will need to pay the deposits even when clients delay payment until completion of the project
- **High import duty:** High import duty for IBS manufacturing equipment and installation machinery such as cranes present another barrier to IBS adoption for both manufacturers and contractors

\(^3\) Implementation Coordination Unit (ICU), Prime Minister’s Department, Malaysia (2014)
**Figure 28** Key issues limiting IBS adoption in Malaysia

<table>
<thead>
<tr>
<th>Limited regulatory impetus</th>
<th>Design Consultants</th>
<th>Contractor</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad definition of IBS and lack of standards</td>
<td>Contractors forced to redesign with manufacturers thus leading to delays</td>
<td>Contractors need to improve effectiveness of project management to adopt just-in-time practices and avoid delays</td>
<td>Low demand means limited economies of scale: and few IBS manufacturers</td>
</tr>
<tr>
<td>Limited enforcement of IBS requirement</td>
<td>Design consultants not fully equipped to incorporate IBS in their designs</td>
<td>Deposit paid to manufacturers can result in cash flow issues for contractors</td>
<td>High import duty for IBS equipment and machinery, with limited IBS manufacturing incentives</td>
</tr>
<tr>
<td>Limited regulatory impetus</td>
<td>Design consultants not adequately trained to incorporate IBS specifically, in the design for manufacturing and assembly or DFMA</td>
<td>Limited number of IBS-ready contractors and workforce</td>
<td>Sparsely located IBS manufacturers, especially in Sabah and Sarawak</td>
</tr>
<tr>
<td>Lack of strong market supply and demand forces</td>
<td></td>
<td>Preference to use cast-in-situ method</td>
<td>Relatively high cost of transportation for components and machinery</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Availability of low-cost foreign labour</td>
<td></td>
</tr>
</tbody>
</table>
LIMITED ADOPTION OF INFORMATION TECHNOLOGY SUCH AS BIM

BIM is beneficial to the construction industry since, with careful planning and selection before construction, it reduces the need for rework and redundancies, thus leading to cost savings. It can ensure the constructability of the design and help the project team to understand and investigate how each assembly and sub-assembly is built and how it has an impact to surrounding trades. This will directly impact the improvement in productivity during construction. The ease of retrieval of information and increased coordination of documents with the use of BIM are key factors which have led to high BIM adoption rates in developed countries.

The adoption of Building Information Modeling (BIM) technology in Malaysia is still low, at 10 per cent, in contrast to the United States at 71 per cent, Singapore at 65 per cent, and the United Kingdom at 39 per cent (see Figure 29). BIM refers to the use of three-dimensional, real-time, dynamic building modeling to increase productivity in building design and construction. BIM can be thought of as a platform of data for the construction project. The information available in the BIM platform will span the full range of data as an integrated data set.

There are several challenges to BIM implementation and adoption in Malaysia, as shown in Figure 30:

- **Lack of skilled talent**: Malaysia lacks a ready pool of skilled talent who are able to prepare plans in BIM and effectively utilise it to liaise with other stakeholders across the value chain.
- **High cost of adoption**: It is costly to purchase the BIM software and to upgrade hardware to be compatible with the BIM software.
- **Requirement of mindset changes**: Adopting BIM requires changes to the current ways of working.

**Figure 29** Percentage in BIM adoption

<table>
<thead>
<tr>
<th>Country</th>
<th>BIM % level of adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>71%</td>
</tr>
<tr>
<td>Singapore</td>
<td>65%</td>
</tr>
<tr>
<td>UK</td>
<td>39%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>10%</td>
</tr>
</tbody>
</table>

- **Lack of a standard object library**: There is a lack of a standard object library for design consultants to refer to, thus access to information is limited on the BIM platform.
- **Lack of guidelines**: Lack of or limited availability of usage guidelines customised to the Malaysian landscape. Without such guidelines, the complexity of implementation cannot be simplified.
- **Local authorities not equipped**: Local authorities and regulators are not yet equipped with BIM-ready hardware and software to receive plans in BIM and process permits and approvals effectively.
- **Local authority staff not trained**: Staff at local authorities have not fully trained and generally have limited awareness of the benefits of BIM adoption.
- **High need for collaboration and integration**: Successful BIM implementation requires strong integration, collaboration and coordination among various disciplines, including integration with disciplines concerned with the operations of a building, such as facility management.

---

85. CIDB Survey 2014; A minimum of Stage 1 BIM maturity is used as a base of % BIM adoption
Lack of Data and Information-Driven Decision-Making

In spite of multiple efforts made to provide the industry with more visibility and access to high-value information, limitations in access, accuracy, breadth and depth of information have prevented advancement of data-driven decision-making in the industry. The issues are further explained below:

- **Access**: Lack of awareness of the benefits of data sources amongst industry players with few coordination efforts
- **Accuracy**: Presently, data is not updated frequently enough and there are few reliable sources with comprehensive and consistent information

For instance, the National Construction Cost Center (N3C) managed by CIDB is a construction industry information platform set up to provide more transparency on different types of construction prices and costs. Key information provided includes building material prices, labour wage rates, and building cost indices. In addition, efforts have also been
“SMEs, being a significant contributor to the economic growth of the nation must adopt the ‘4 Cs of Integrity’ in order to remain competitive - Commitment, Competence, Clarity and Credibility. The right attitude coupled with the right skills set and capability will only boost SMEs to higher levels of success in their entrepreneurial journey.”

Dato’ Hafsah Hashim / Chief Executive Officer / SME Corp.

made to provide the public with information online on current public sector construction projects currently available for tender. It is important to acknowledge that beyond creating access, it is critical to uphold data integrity and accuracy to ensure industry stakeholders are able to effectively utilise the information provided. While these efforts have been commendable, there is further room for improvement, in terms of greater information availability, transparency and centralisation.

**HIGH PROPORTION OF SUBSCALE SMEs, INCLUDING BUMIPUTERA SMEs AND ENTREPRENEURS**

In the Malaysian construction industry, contractors are divided into categories or grades according to specific size brackets (as shown in Figure 31), ranging from small contractors (G1-G3) to medium-sized contractors (G4-G5), up to the large (G6-G7) contractors. SMEs in construction are generally defined as contractors within the categories G1-G5 as shown in Figure 31. Figure 36 indicates that the industry is highly fragmented, with subscale SMEs collectively accounting for 90 per cent of total contractors while large contractors make up the remaining 10 per cent. At the same time, the bulk of professional firms including architects, engineers and quantity surveyors are sole proprietors. This long tail of SMEs and low concentration of larger contractors or firms in the construction industry is peculiar vis-a-vis other industries. A case in point would be the Electrical & Electronics industry, where ~65 per cent of companies are SMEs.

A reason for the high fragmentation in the industry is partly attributable to the low barriers to entry into the construction industry, driven by registration criteria that are relatively easy to fulfil for small contractors. For example, the registration of a contractor in the smallest size bracket (G1) requires a tendering capacity of RM 200,000 and paid up capital of RM 50,000 and technical personnel with a construction-related course certificate from a construction academy or training centre.

In terms of Bumiputera contractors, specialisation remains low, as demonstrated by the number of Bumiputera contractors registered as having expertise in specialist trades especially, in growth areas or in areas that will be in high demand as a result of projects under RMK11. Examples of such trades are IBS (2 per cent of registrations), railworks (0.03 per cent of registrations) and oil and gas (0.03 per cent) (see Figure 33). Bumiputera firms account for ~56 per cent of the construction industry, as shown in Figure 35. Furthermore, two thirds of the G1 contractors are Bumiputera.

**Figure 31 CIDB contractor grades**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Paid-up capital (RM)</th>
<th>Tendering Capacity (RM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>5,000</td>
<td>&lt; 200,000</td>
</tr>
<tr>
<td>G2</td>
<td>25,000</td>
<td>&lt; 500,000</td>
</tr>
<tr>
<td>G3</td>
<td>50,000</td>
<td>&lt; 1,000,000</td>
</tr>
<tr>
<td>G4</td>
<td>150,000</td>
<td>&lt; 3,000,000</td>
</tr>
<tr>
<td>G5</td>
<td>250,000</td>
<td>&lt; 5,000,000</td>
</tr>
<tr>
<td>G6</td>
<td>500,000</td>
<td>&lt; 10,000,000</td>
</tr>
<tr>
<td>G7</td>
<td>750,000</td>
<td>No limit</td>
</tr>
</tbody>
</table>

86. Malaysia Productivity Corporation, Department of Statistics Malaysia, 2010
87. CIDB Statistics
**Figure 32 Definition of SME in construction**

<table>
<thead>
<tr>
<th>Type of enterprise</th>
<th>Definition</th>
<th>Contractor Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microenterprise in services</td>
<td>Is an enterprise with full-time employees of less than 5 or with annual sales turnover of less than RM200,000</td>
<td>G1</td>
</tr>
<tr>
<td>Small enterprise</td>
<td>Is an enterprise with full-time employees of between 5 and 19 or with annual sales turnover between RM200,000 and less than RM 1 Mn</td>
<td>G1-G3</td>
</tr>
<tr>
<td>Medium enterprise</td>
<td>Is an enterprise with full-time employees of between 20 and 50 or with annual sales turnover of between RM 1 Mn and RM 5 Mn</td>
<td>G4-G5</td>
</tr>
</tbody>
</table>

**Figure 33 Breakdown of firms/contractors in the industry**

Number of construction firms, 2008-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Registered contractors ('000)</th>
<th>SME as % of registered contractors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>63</td>
<td>91.4</td>
</tr>
<tr>
<td>2009</td>
<td>65</td>
<td>91.1</td>
</tr>
<tr>
<td>2010</td>
<td>65</td>
<td>90.6</td>
</tr>
<tr>
<td>2011</td>
<td>63</td>
<td>90.6</td>
</tr>
<tr>
<td>2012</td>
<td>70</td>
<td>90.2</td>
</tr>
</tbody>
</table>

**Figure 34 Number of Bumiputera contractors registered in specific specialised trades (2015)**

Number of Bumiputera registrations by trade (as identified for enhancement as part of Specialist Trade Programme)

<table>
<thead>
<tr>
<th>Trade</th>
<th>Number of Bumiputera registrations ('000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railworks</td>
<td>33.3</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>2.0</td>
</tr>
<tr>
<td>Plumbing</td>
<td>2.8</td>
</tr>
<tr>
<td>Electrical wiring</td>
<td>6.7</td>
</tr>
<tr>
<td>Air conditioning</td>
<td>9.4</td>
</tr>
<tr>
<td>Tiling</td>
<td>12.3</td>
</tr>
<tr>
<td>Landscaping</td>
<td>22.0</td>
</tr>
<tr>
<td>Maintenance</td>
<td>24.9</td>
</tr>
<tr>
<td>Concrete</td>
<td>33.4</td>
</tr>
<tr>
<td>Painting</td>
<td>153.6</td>
</tr>
</tbody>
</table>

Bumiputera within trade as a % of total Bumiputera registrations

- Railworks: 0.03%
- Oil & Gas: 0.03%
- IBS: 1%
- Roadworks: 1%
- Plumbing: 2%
- Electrical wiring: 2%
- Air conditioning: 3%
- Tiling: 6%
- Landscaping: 7%
- Maintenance: 8%
- Concrete: 9%

Key capabilities required by projects under RMK11
The subscale nature of the majority of the firms including Bumiputera firms restricts their ability to invest in technology and the building up of a high-calibre workforce. In addition, some firms who are not able to effectively execute on tenders won may sometimes resort to subcontracting to other players.

The government has introduced various programmes to uplift the performance of Bumiputera vendors in Malaysia, including in the construction industry. For example, the carve-out and compete initiative under TERAJU is aimed at increasing Bumiputera participation in the government’s mega projects. Under this programme, qualified Bumiputera companies must compete with each other to secure contracts for specific projects and selection will be based on merit. Under this agenda for example, the MRT project for the Sungai Buloh-Kajang line targeted 43 per cent of the project value to be awarded to Bumiputera companies. To-date, this project has exceeded its target and 45 per cent has been awarded to Bumiputera players\textsuperscript{92}. However, the carve-out and compete programme is still in its early stages and the implementation of the policy can be made more specific such as to specify nature of contracts to be awarded to Bumiputera players as well as keeping close monitoring and tracking of performance of these contractors. The implementation of the policy requires continuous improvement in order to ensure that carving out of projects is carried out meaningfully and leads to long-term capacity and capability-building for Bumiputera players in the construction industry.

\textsuperscript{91} CIDB Statistics (2014)

\textsuperscript{92} MRT Corp Annual Report, 2015
The CITP aims to increase productivity by two-and-a-half times, which corresponds to a target value-add of USD 16,500 per worker\(^1\). This more than doubling of productivity will be equally matched by higher wages within the construction industry. Based on the six challenges outlined in the previous section, six initiatives are recommended to uplift workforce and technology productivity, with a holistic approach.

**Initiatives**

**INITIATIVE P1**
Continue investment in human capital development in construction

Continuous efforts to attract and retain locals in the construction industry will raise the quality of the construction workforce over time. It will also have a positive impact on the nation’s socio-economic situation by reducing long-term reliance on low skilled foreign labour and by providing avenues for employment to local graduates, school-leavers and workers.

It is critical that Malaysia takes the first step toward re-balancing construction work to pave the way towards creating a robust, self-sustaining construction workforce. Firstly, it is recommended that robust and frequent manpower planning be put in place to identify the human capital needs of the construction industry by taking into account the growth and strategic direction of the industry. This planning will provide clarity into the skills and specialised trades required by the construction industry and will further reveal the gaps currently filled by foreign labour. In addition, the streamlining of construction-related courses is recommended to ensure overlapping content and redundancies therein are eliminated. This will culminate in the synthesis of a development map for students to navigate the path toward a successful career in construction. The map will consist of various courses that act as ‘checkpoints’ to chart the path towards a particular skilled trade or goal. This map will help to identify any gaps in training and development offered and it will also highlight any courses that are duplicated ineffectively. The identification of gaps with the target end-state will serve as an indicator for which new courses need to be developed, enhanced, reduced or eliminated in order to enhance the comprehensiveness of training and capability-building in the industry.

---

\(^1\) At 2005 constant value
Additionally, the CITP offers the opportunity to increase the reach, effectiveness and comprehensiveness of training and development for workers, personnel and professionals to a world-class level, which will benefit both the individual as well as the industry players. One key area of enhancement will be to conduct curricula reviews and development of improved curricula and training modules material to ensure that content is up-to-date with industry development and requirements. It is important that students, including professionals looking to continuously develop and sharpen their skills, be aware of, and are well-versed in new technology and modern practices. In parallel, there will be efforts to increase the quality of trainers and training providers through train-the-trainer programmes in collaboration with world-class experts. Taken together, this aims to train and develop students to fill the demand expected within certain key sectors that construction supports, for example in oil and gas related construction.

The provision of practical training should also be emphasised. Local graduates in both technical & vocational courses and professional consultancy service courses are often perceived to be insufficiently equipped with real working experience to perform their roles. Providing more opportunities for specialist apprenticeships and internships and ensuring that these programmes offer diverse exposure and opportunities to develop required competencies will increase the quality of graduates.

While there are already ongoing efforts to introduce more on-the-job training and address skills gaps, CITP provides a strong platform to raise the workforce quality to the next level. The specialist apprenticeship programme under the CITP is a structured programme where graduates from Akademi Binaan Malaysia (ABM) and other technical education

“To thrive in the construction industry, it is important for construction industry players to recognise the mega trends that are altering the industry, understand the impact of these trends on businesses, and adopt strategically sound, competitive responses to embrace change, and use them to their advantage.”

Dato’ Sr. Abdull Manaf bin Haji Hashim / President / Board of Quantity Surveyors Malaysia (BQSM)

Benchmark 9

CONSTRUCTION INDUSTRY ADVISORY COMMITTEE ENSURES DEVELOPMENT OF TRAINING STANDARDS IN AUSTRALIA

The Australian Construction and Property Services Industry Skills Council (CPSISC), through the Construction Industry Advisory Committee (CIAC), is able to ensure the development of national training standards that are responsive to industry needs. The CIAC aims to provide input on training and skills development. The CIAC has a broad representation through its advisory board, which includes more than 20 committee members, industry associations, trade unions and relevant authorities. Members also include providers of professional consultancy and construction services, such as Building Designers Australia and the Master Builders Association.

and vocational training (TEVT) institutes are hired as apprentices by industry players implementing large projects. The programme will up-skill graduates through customised classroom and practical training. For high-potential graduates, it will provide fast-track, internationally-certified training and potentially job placement. Apprentices will receive a stipend during the programme and will also receive certification upon graduation. All in all, the specialist apprenticeship programme will provide the construction industry with a highly-qualified workforce to perform immediately on the job, and reduce the amount of re-training required. The specialist apprenticeship programme is to be co-developed by CIDB and industry training leaders. In Australia such apprenticeship programmes demonstrate that close collaboration with industry is critical given the wealth of experience and logistics support industry players can offer.

In complementary efforts, the ABM transformation programme developed by CIDB and CIDB Holdings is also underway. The goal of the ABM transformation programme is to establish the six ABMs nationwide as Centres of Excellence. Each ABM would be positioned as a Centre of Excellence for a specific area, thereby focusing its resources (for example,

**Benchmark 10**

**IMPLEMENTATION OF APPRENTICESHIP PROGRAMMES IN AUSTRALIA**

In Australia, Group Training Organisations (GTOs) facilitate apprenticeship hires for SMEs. They are the de facto employer of the apprentice, and may specialise in a particular industry or cater for a specific region. GTOs select and recruit apprentices, who work under apprenticeship or trainee contracts at SMEs. GTOs also provide logistics support to SMEs by undertaking employer responsibilities such as management of wages, allowances, sick days, holidays, and others.

The National Standards for Group Training (NSGT) provides a framework for promoting national consistency and quality of group training. GTOs must be registered under the National Standards for Group Training to apply for funding.

Sources:
“The Eleventh Malaysia Plan will produce a fundamental shift in how the system currently operates in order to develop world-class talent that can thrive in a globally competitive economy.”

11th Malaysia Plan / Chapter 5 / Accelerating human capital development for an advanced nation

curriculum development, trainer development, infrastructure, research, machinery or equipment, international certification and accreditation programmes and the likes) on the associated trades and skills relevant to that area.

Alignment with national programmes
These initiatives contribute to the third strategic thrust of RMK11: Accelerating human capital development for an advanced nation. The streamlining and consolidation of construction-related courses will help eliminate redundancies and duplications in training offered by providers and will contribute to the RMK11 focus to transform the TEVT sector and meet industry demand93. Train-the-trainer programmes and curriculum content enhancement will enhance the quality and delivery of TEVT programmes to improve graduate employability, which is another strategy under RMK11. The streamlining exercise will culminate in the development of a training map that will enable identification of training gaps as well as low-impact and overlapping programmes94.

Highlighted roles of key stakeholders95
Support for implementation is required from key agencies such as MOE, MOHR, TEVT institutes, and the likes. Scope of support includes sharing of information, data, expertise and input to develop world-class training and curricula content for the construction workforce.

At the same time, CIDB will contribute by enhancing existing accreditation and certification mechanisms, review and audit construction-related courses and develop clear training guideline map, containing an identification matrix of recommended institute or training providers by training course and specific skills. CIDB will also lead the establishment of a Technical Advisory Committee to review training courses in Malaysia and identify Areas of Expertise for each training provider. These recommendations are in line with CIDB’s mandated function to advance, review and streamline training in the industry and to register and accredit contractors and construction personnel, in accordance with the Amendment Act 520 (2011).

INITIATIVE P2
Enhance control and balance of workforce supply

Implement regular industry manpower planning
It is recommended that regular manpower planning be established to reduce the mismatch between labour demand and supply. On the demand side, given the push for mechanisation and technology adoption, there will be an increased demand for high-skilled personnel at various levels. To respond to this requirement, training institutes, colleges and universities will need to develop the appropriate courses and build a pipeline of highly-trained workforce at the degree, diploma and certificate levels.

Singapore established similar practices, as shown in Figure 37. In the Singapore model, industry committees assess the demand for skills and trades before the Building and Construction Authority (BCA) channels feedback to various training providers to enrich their course offerings in order to produce a workforce that possesses the skills to meet the projected demand.

93. Focus area B, Chapter 5, 11th Malaysia Plan
94. Strategy B2, Focus area B, Chapter 5, 11th Malaysia Plan
95. List of stakeholders and roles is not exhaustive
To strengthen this system and the reliability of skills assessments, Overseas Test Centres have been established in foreign labour source countries. These Centres assess and certify workers and the skills and experience information of these workers are fed into the tiered-visa system. These assessment centres implement trade tests at Skills Evaluation Certificate Knowledge or SEC (K) level. The SEC (K) consists of a written test and a practical test. These tests ensure that workers possess essential trade knowledge such as the materials, tools and equipment used in the trade, work sequence, good practices, safety requirements, and the likes. The tests also assess a worker’s practical craft-skills competency and ensures the worker is able to meet minimum quality standards for the trade based on the expected skills set of a skilled tradesman.
In a similar vein, CITP recommends the establishment of assessment centres in source countries for construction workers. This is essential and complements the objectives of the tiered-visa system. With more effective assessment of workers’ skills while still in the source country, and a structured visa system that encourages more higher skilled workers to enter Malaysia, CITP will be able to reach its goal to raise the quality of foreign labour and improve the productivity of the industry.

**Alignment with national programmes**
These initiatives contribute to the third strategic thrust of RMK11: ‘Accelerating human capital development for an advanced nation’.

A balanced manpower demand and supply model will reduce the mismatch between labour demand and supply, a key focus of RMK11. The manpower demand and supply model will take into account input from policies to be set by OSCs and MOHR under the RMK11 strategy to streamline the recruitment process of foreign workers. The end-goal of the implementation of a tiered-visa system linked to skill levels is to raise the quality of foreign labour entering Malaysia, and this will contribute to the overall up-skilling of the construction workforce. Further, it will improve management of foreign workers, a key strategy under RMK11. Taken together, the construction workforce will shift towards improved labour productivity and wages through the shift to high-skilled jobs. These are aspirations aligned with the RMK11.
Highlighted roles of key stakeholders\(^{101}\)
Support for implementation is required from key agencies such as EPU, MOHR, MOFA, Immigration Department of Malaysia, and the likes. Scope of support includes integrating the agenda for demand-supply planning into the national Human Capital Development Council (HCDC), conducting analyses to forecast and monitor manpower demand-supply model, reporting to MOHR on manpower demand-supply for planning and implementation, implementation of a tiered-visa programme for foreign construction workers, and establishing assessment centres at source countries to determine skill levels prior to entering Malaysia.

At the same time, CIDB will contribute to integrating the agenda for demand-supply planning into HCDC, setting up collaboration opportunities with TEVT providers, universities, and source countries to review training gaps and identify key resolutions, and provide feedback to MOHR on manpower demand-supply for planning and implementation. CIDB will also enhance accreditation of qualified workers, contractors and personnel and participate in the working group to define categories for different visa tiers tied to skill level.

Adoption of IBS will continue to be an important nationwide initiative. CITP recommendations support the MOF circular mandating all public projects worth RM 10 Million and above to achieve a minimum of 70 IBS score\(^{102}\). Maximum points are 100, and a higher IBS Score is a reflection of a reduction in site labour, lower wastage, less site materials, cleaner environment, better quality, neater and safer construction sites, faster project completion as well as lower total construction costs.

As we can see from the Singapore example, shifting regulations and introducing tighter requirements (by increasing mandatory requirements on B-scores and C-scores) has helped drive adoption of IBS. While the CITP does not propose changes in IBS score calculation, the CITP captures the essence similar to the Singapore benchmark by recommending tightened IBS-related requirements.

Several recommendations are laid out in CITP. For example, there is a proposed change in the public procurement approach. The existing procurement structure can constraint contractors by requiring them to have high upfront financial capital to be able to procure IBS components from suppliers. CITP recommends the separation of IBS procurement from the main contract, the burden of financial liquidity will be removed and payments will be managed by project owners and clients as they can directly procure the IBS components from suppliers. This decoupling of IBS procurement will thus reduce cost to the contractor and will increase demand certainty for IBS suppliers. Direct procurement of IBS will also generate competitiveness amongst IBS manufacturers and can eliminate any potential mark up of prices via main contractors. The current procurement structure and the proposed procurement structure (entailing separation of IBS from the main contract) are illustrated and

---

\(^{101}\) List of stakeholders and roles is not exhaustive

\(^{102}\) IBS Content Scoring System (IBS Score) is a systematic and structured assessment system that can be utilised to measure the usage of Industrialised Building Systems (IBS) in a consistent way. It is based on a standard formula that comprises three major parts, i.e., Score for Structural Systems (max 50 points), Score for Wall Systems (max 20 points) and Score for Other Simplified Construction Solutions (max 30 points).
described in Figure 39. Given the high number of construction projects undertaken by JKR, it is recommended for JKR to pilot this change in public procurement. CITP also emphasises that the government provide leadership in obtaining and standardising quality of design, specifications and materials of IBS components, given its advantage as a key client of the industry. It can lead this charge through design and construction of institutions such as schools, hospitals and government offices.

The CITP also recommends that economic mechanisms be introduced to help improve the economic viability of IBS and encourage further mechanisation by manufacturers.

- For example, a reduction in import duty for IBS manufacturing and installation equipment can be an avenue to reduce the cost burden for suppliers and increase the supply of IBS components
- Another consideration is to introduce a tax holiday for suppliers building new qualifying IBS manufacturing plants
A third consideration is to provide a working capital revolving fund to defray the upfront liquidity burden for contractors who have to provide up-front deposit for IBS component procurement.103

Furthermore, the publication of IBS catalogues, harmonised with the multiple IBS suppliers, would further enhance IBS adoption by increasing accessibility of information on IBS component specifications. CITP also recommends the incorporation of IBS and modular coordination in JKR’s Pre-Approved Plans (PAP) followed by a requirement for common public building construction and government-linked projects to use Pre-Approved Plan unless exempted by the Ketua Pengarah Kerja Raya (KPKR). Engaging local authorities and state governments will be key to the success of these recommendations. It is important for the government to propagate the standardisation of designs and practices to various state authorities, where building plans are submitted, vetted and approved, to ensure consistency in quality and policy implementation.

To encourage adoption of IBS in the private sector, two key activities are recommended for consideration:

- Encourage a 50 IBS score requirement for projects valued over RM 10 Million in Klang Valley as a prerequisite for the issuance of the Development Order
- Incorporate into the Uniform Building By-Laws (UBBL) the requirement for a 50 IBS score for private projects valued over RM 10 Million

These activities to promote the uptake of IBS will have to correspond with strong human capital development to undertake the IBS work. Thus, appropriate training programmes need to be developed and made available. These efforts seek to drive economies of scale for IBS adoption and mechanisation. Together, they will result in increased level of industrialisation and mechanisation in the Malaysian construction industry.

---

103. Revolving fund may not be required should the separation of IBS procurement from main contract occur

---

**Benchmark 11**

**STRENGTHENING OF BUILDABILITY LEGISLATIVE FRAMEWORK BY INCREASING MANDATORY REQUIREMENTS IN SINGAPORE**

Singapore has strengthened its buildability legislative framework by increasing mandatory requirements on Buildability scores (B-Score) and Constructability scores (C-scores) across all new building projects. A B-Score (Buildability Score) computes the extent to which the design of a building facilitates ease of construction, as well as the productivity levels of construction techniques and processes adopted in building works. A C-Score (Constructability Score) computes the ease and efficiency at which structures can be built. Singapore has gradually raised its minimum B-Scores and C-Scores by a total of 5 points from 2011 to 2014. This requirement is applied to all new building projects with Gross Floor Area (GFA) of more than or equivalent to 2,000 m².

Singapore also places higher requirements for projects built on government land. It raises the minimum buildable design score by five points for these projects. For example, the minimum B-Score for new school building built on government land with GFA of more than or equivalent to 25,000 m² is 80, compared to 75 for other projects.

Singapore often shifts the allocation of points to reflect technology advancement. B-Score points allocated for structural systems were revised from 50 to 45 and reallocated to wall systems which was revised from 40 to 45. This encourages the use of productive technology by allocating bonus points which are awarded for the use of off-form precast concrete external walls and columns. This also discourages the use of perceived older technology by introducing demerit points such as the use of transfer beams which have been given demerit points between 1 to 3 point deductions.

Sources:
2. Code of Practice on Buildability, BCA. (http://www.bca.gov.sg/)
**Case for Change**

Vicious cycle makes IBS adoption challenging
- Lack of demand driven by poor economics
- Lack of scale resulting in high IBS cost
- Contractors not equipped to carry out effective project management, resulting in on-site problems
- SME contractors face cashflow issue in IBS procurement
- Lack of demand driven by poor economics
- Few IBS suppliers driven by small market
- Low supply of IBS components at high price

**High cost of adoption**
- Duty on IBS equipment high

**Malaysia**
- 40%

**Singapore**
- 7%

**Thailand**
- 7%

**Philippines**
- 12%

**Indonesia**
- 20%

- Relatively small pool of IBS specialists available
- Upfront payment and long lead time make IBS take-up costlier

---

**Highlighted Recommendations**

**Drive scale via regulations**
- Ensure IBS adoption in the private sector via inclusion in Development Order and implementing changes to UBBL\(^2\) requirements

**Improve economics of IBS adoption**
- e.g., consider tax/levers to improve economics for local IBS manufacturers
- e.g., tax holiday on IBS component plants
- e.g., higher plot ratio for IBS compliance
- e.g., revolving fund for IBS working capital

**Raise enablers for IBS adoption**
- Increase pool of IBS specialists i.e., training, tiered visa
- Develop IBS catalogue with harmonised BIM design library

**Change public procurement approach**

---

1. Not exhaustive
2. Uniform Building By-Laws

---

**Productivity via IBS**

**Baseline**

- Only 24% of target public projects RM 10 Mn and above have achieved 70 IBS score

**Outcomes**

- 100% of public projects RM 10 Mn and above achieve 70 IBS score
- 100% of private projects RM 10 Mn and above achieve 50 IBS score
Alignment with national programmes
These initiatives contribute to the RMK11 as unlocking productivity is an important pillar to transform wealth-generation in Malaysia. A common goal of each of the six RMK11 thrusts is the aim to unlock productivity for accelerated sector growth\textsuperscript{104}. In terms of macroeconomic prospects, RMK11 seeks to raise industrial productivity through greater adoption of automation. This goal will be supported by Initiative P3 of the CITP.

Highlighted roles of key stakeholders\textsuperscript{105}
Support for implementation is required from key agencies such as MOF, PR1MA, MITI, ICU, JKR, KPKT, and the likes. Scope of support includes amending procurement practices for public projects to separate IBS procurement from main contract and heightening enforcement of IBS adoption and compliance with MOF Circular SPP Bil. 7 2008 and MOF Circular 1PPL 1/2013. Collaboration with JKR will also be needed to amend Pre-Approved Plans to incorporate IBS and modular coordination and with KPKT and state governments to amend and gazette UBBL to facilitate adoption of IBS. In addition, coordination will be required to explore feasibility of implementation of economic mechanisms to heighten IBS adoption among contractors and to stimulate growth of manufacturers.

At the same time, CIDB will undertake a cost-benefit analysis for adoption of IBS and finalise tax incentive proposals. CIDB will also contribute by engaging stakeholders to facilitate changes in practices and regulations and will provide input into the design of economic mechanisms to improve the economics of IBS machinery and equipment for the manufacturers and suppliers. These recommendations are in line with CIDB’s mandated function to monitor implementation of IBS in the construction industry, in accordance with the Amendment Act 520 (2011).

The BIM platform will enable open and accurate sharing of information to allow for efficient and effective life cycle management of the built environment. Currently, BIM adoption in Malaysia is in Stage 1, as described in Figure 40. It is important to support companies in overcoming the barriers to adopting technology such as BIM, through a holistic package of policy, specific programmes and initiatives. The CITP recommends that Malaysia moves beyond Stage 1 into Stage 2. Stage 1 BIM adoption is achieved when object-based BIM software is used within only one discipline (for example in Architecture). Stage 2 BIM adoption is reached when two or more disciplines use the digital model to collaborate on a project. Thus, Stage 2 BIM procurement specifications need to be defined to support the recommendation to use this specification, starting with pilot public projects before gradually expanding to private projects.

CITP recommends the establishment of a reference centre to support BIM adoption in Malaysia. The centre will house BIM technologies, showcase its benefits, provide training and raise awareness of BIM and other cutting-edge IT and modern methods that are transforming construction globally. Graduates of Akademi Binaan Malaysia (ABM) will be trained and groomed as ‘BIM experts’, and will provide training and hands-on guidance for BIM adoption at the reference centre. CITP also recommends the introduction of a certification and accreditation programme for BIM personnel. This is to ensure that the quality of BIM personnel in construction meets desired and required standards. Any certification and accreditation should be endorsed by international bodies and acknowledged by Malaysia’s professional boards. The reference centre will also launch BIM as a service, which will adopt

\textsuperscript{104} Chapter 1, 11th Malaysia Plan
\textsuperscript{105} List of stakeholders and roles is not exhaustive
the software as a service (SaaS) model, where consumers only need to pay for the software when they need it or to develop a home-grown BIM-enabled solutions with a lower cost of ownership. This model will make BIM adoption much more affordable.

The reference centre will also embark upon raising awareness on the importance of shifting towards cradle-to-cradle design, a biomimetic approach to the design of products and systems. Cradle-to-cradle design implies mimicking nature’s processes that view materials as nutrients that circulate throughout metabolisms. Aligned with the Environmental Sustainability Thrust of CITP, cradle-to-cradle design pushes for every material to be designed so that it can be used over and over again instead of being ‘downcycled’ into lesser products, ultimately becoming waste. The cradle-to-cradle framework is only 13 years old globally, and the CITP will focus on raising awareness of its importance and relevance within the Malaysian construction industry.

Furthermore, a national BIM guide and standard BIM library containing local manufacturer products including IBS components will be developed to enable BIM adoption by equipping the BIM platform with relevant components required during the design stage of construction. A defined BIM guide with clear implementation Stages, methodologies and standards is critical to bolster adoption rates, as evidenced in the UK BIM benchmark. It is recommended that a Malaysian-specific BIM guide be developed in collaboration with worldwide BIM experts such as buildingSMART\textsuperscript{106}.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
\textbf{Stage of BIM} & \textbf{Isolated} & \textbf{Collaborative} & \textbf{Integrated} \\
\hline
0 - Manual & 2D Manual and CAD based (2D or 3D) & \textbf{1 - Modelling} & \textbf{2 - Collaboration} \\
& & Single disciplinary use of object-based 3D modelling software within one discipline & Sharing of object based models between two or more disciplines \\
\hline
\textbf{BIM Usage} & \textbf{Representation} & \textbf{Prototype} & \textbf{Full information capture} \\
\hline
\end{tabular}
\caption{Stages of BIM adoption}
\end{table}

\textsuperscript{106} www.buildingsmart.org
CITP recommends a minimum of 40 per cent implementation rate of BIM stage 2 for public projects above RM 100 million. This target will be supported via adequate training for architects, engineers, designers, professionals, contractors, and other industry players. Furthermore, it will be supported on the regulator side through the development of a BIM-based design review and checking mechanism to be installed at local authorities, which are to be equipped with the appropriate hardware and software, and whose staff will be adequately trained in BIM adoption.

It is also recommended that Malaysian BIM research and development (R&D) efforts be carried out to develop localised BIM technologies such as the ‘Malaysia Construction Integrated Solution’ (eMCRIS) to lower the cost of ownership and increase adoption of BIM among local players. Further, a mechanism is recommended to be put in place to help lower BIM-related software investment cost for industry players.

Benchmark 12

A SET OF GUIDELINES FOR BIM PUBLISHED BY THE UK BUILDING INFORMATION MODELLING (BIM) TASK GROUP

In the UK, the British Standards Institution (BSi) and BIM Task Group published a set of standard and guidelines as a reference for using BIM.

These guidelines span three main documents, namely the Key Roadmap deliveries (i.e., BS 1192 established methodologies to set up a BIM project), the Maturity level v.2 guides creation (guidelines for maintenance and use of open sharable asset information) and COBie (i.e., Construction Operations Building Information Exchange, serves as a guide to share predominantly non-graphic data for the use in facility management).

Within the Key Roadmap deliveries, BS 1192 establishes the methodology to manage BIM-based projects, specifically on approaches to manage production, distribution and quality of construction information. These approaches could be further fine-tuned for particular projects as and when required.

For the Maturity level guide creation, BIM maturity levels allow for simple referencing as to where various documents should be applied. This enables concise description and understanding of processes, tools, and techniques to be used. There are four maturity levels of BIM adoption:

- Level 0: Usually in 2D environment with unmanaged CAD coordination
- Level 1: Managed computer-aided design (CAD) in 2D or 3D format with a collaboration tool (extranet) providing common data environment
- Level 2: Managed 3D environment held in separate discipline BIM models and tools with attached data
- Level 3: Fully-open process with single project model, data integration and exchange

This detailed guidelines provided by the BSi and BIM Task Group are examples of the efforts that have led to facilitation of BIM take-up by industry and an increase in BIM adoption rates in the UK.

Sources:
“Sunway Construction Group is always at the forefront of technology application and innovation in the construction industry. In addition to the substantial investments in sophisticated plant and heavy construction machinery, it has embarked on the use of Building Information Modelling and latest Virtual Design and Construction System. This is in line with the Group’s policy of continuous improvement or ‘Kaizen’ in enhancing productivity and competitiveness.”

Mr. Kwan Foh Kwai / Senior Managing Director / Construction Division / Sunway Group

Automation and mechanisation as well as further R&D for technology development, adoption and localisation are recommended to be focus areas to ensure the Malaysian construction industry continuously strives to adopt modern and innovative construction methods and processes throughout the value chain. Greater technology adoption in human capital development and R&D will be a transformative step change for the industry and will raise the quality of the workforce and create higher income jobs.

Alignment with national programmes
A common goal of each of the six RMK11 thrusts is the aim to unlock productivity for accelerated sector growth\(^ {107}\). RMK11 stresses the need to leverage data to enhance outcomes and lower costs in Malaysia overall and to proliferate open data among stakeholders and agencies\(^ {108}\). The BIM platform will achieve exactly that by acting as a tool to house the full range of data for a project as an integrated data set. By equipping local authorities with appropriate hardware, software and human capital via training to receive building plans on the BIM platform, CITP will contribute to RMK11’s goal to enhance service delivery\(^ {109}\).

Highlighted roles of key stakeholders\(^ {110}\)
Support for implementation is required from key stakeholders such as KPKT, JKR, global BIM experts and the likes. Scope of support includes co-developing a national BIM guide and standards to ease BIM adoption. Collaboration will be needed to roll-out BIM-based building design review and checking system/mechanism at local authorities and to include BIM procurement specifications for large-scale public projects by JKR. In addition, stakeholders need to work together to launch a research lab for innovation in building at local universities.

At the same time, CIDB will co-develop the national BIM guide and standards as well as develop a BIM roadmap for Malaysia. CIDB will also collaborate with JKR and global BIM experts to launch a BIM certification and accreditation programme. Beyond that, CIDB will develop cloud BIM software server to enable remote access and public usage. CIDB will, via the BIM reference centre, design and conduct awareness programme on cradle-to-cradle design and circular economy. CIDB will also collaborate with industry and universities to conduct research and programmes to promote mechanisation and adoption of BIM.

---

\(^{107}\) Chapter 1, 11th Malaysia Plan
\(^{108}\) Strategy A3, Focus area A, Chapter 9, 11th Malaysia Plan
\(^{109}\) Focus area A, Chapter 9, 11th Malaysia Plan
\(^{110}\) List of stakeholders and roles is not exhaustive
INITIATIVE P5
Enhance availability of strategic information via National Construction Industry Information Centre (NCIIC)

Enhance awareness and certainty on upcoming construction demand

As the construction industry progresses, CITP recommends that a comprehensive, accurate and reliable data repository be put in place in order for the industry to conduct mission-critical analyses for business decision-making purposes. In terms of information availability, it is imperative to have detailed construction and public sector project pipeline data. Having longer and better visibility of the public sector construction project pipelines for example will provide industry players with better demand certainty, and allow them to plan and invest over the longer term. It is recommended that this project pipeline be extended to the private sector such as via coordination with local authorities. Information on projects that have received a Development Order (construction planning approval) can also be channelled from local

Benchmark 13

BCA SINGAPORE PROJECT PIPELINE

The Building and Construction Authority (BCA) in Singapore publishes the public construction tender pipeline by different cost categories, and provides a detailed breakdown of building and infrastructure works as well as a quarterly forecast of public projects.

Figure 41 Singapore public project pipeline

Number of Construction Tenders To Be Called By Public Sector Agencies

<table>
<thead>
<tr>
<th>Construction Cost Category</th>
<th>Development Type</th>
<th>Q1 2014</th>
<th>Q2 2014</th>
<th>Q3 2014</th>
<th>Q4 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to $13m</td>
<td>Residential (e.g. Public housing)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Education (e.g. Retrofitting of teaching facilities, upgrading of schools)</td>
<td>20</td>
<td>18</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Other buildings (e.g. Retrofitting of government amenities)</td>
<td>18</td>
<td>17</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Sub-total (Building)</td>
<td>38</td>
<td>35</td>
<td>26</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Road &amp; Bridge (e.g. Pedestrian walkways &amp; overhead bridges)</td>
<td>13</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Sewerage &amp; Drainage (e.g. Drainage improvement, construction of drains)</td>
<td>6</td>
<td>3</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>M&amp;E – Rails and Roads (e.g. M&amp;E for MRT)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Other Civil Engineering (e.g. Parks &amp; park connectors, waterway, utilities)</td>
<td>10</td>
<td>21</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Sub-Total (Civil Engineering)</td>
<td>29</td>
<td>28</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>67</td>
<td>63</td>
<td>48</td>
<td>33</td>
</tr>
<tr>
<td>▲ $13m - $40m</td>
<td>Residential &amp; Upgrading (e.g. Public housing, hostel developments) ▲</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Source:
Construction Tenders, BCA. (http://www.bca.gov.sg/)
Benchmark 14

UK GOVERNMENT PUBLISHES UPCOMING PUBLIC SECTOR PROJECTS

The UK government publishes the pipeline of upcoming public sector projects, be it public buildings or infrastructure. This information is published online for public access. It organises the information by region, sector, status, forecast accuracy, project size, and the like. GIS data layers is utilised to lay out the information in a graphical, user-friendly interface.

This helps construction companies plan ahead and help with business decisions. Examples of business decisions include balancing manpower needs, forecasting specific training needs, managing cost, investing in new technology adoption, deciding on and business expansion financing and providing triggers to form consortia for collaborative SME procurement.

Source: UK Government Construction Pipeline (http://www.building.co.uk/government-construction-pipeline-microsite/note)

Integrate construction-related data into the National Construction Information Centre

It is recommended that a comprehensive contractor and construction personnel database be established by integrating information held by various agencies such as CIDB, JKR, and the Immigration Department of Malaysia. All aggregated data (as illustrated in Figure 42) on the construction industry can be housed in a single portal called the National Construction Industry Information Centre (NCIIIC) and it is critical for the information to be publicly available on a central platform, to provide access to all players, in particular smaller scale players and help enable a level playing field.

Enhance price and cost information on industry resources

The CITP proposes making publicly available construction price and cost data at a more granular level to enable industry players to estimate costs and pricing better, and thus sustain profitability. While CIDB currently publishes price and cost data via its portal (National Construction Cost Centre or N3C), the breadth and accuracy of data can be further enhanced.
Alignment with national programmes
This initiative contributes to the RMK11 focus of leveraging data to enhance outcomes and lower costs. The consolidation, integration and provision of comprehensive data on the industry will enable industry players and government agencies to make informed decisions for business planning and policy formulation purposes. The large amount of information to be offered on the NCIIC will act as the foundation to place the industry in a position to leverage big data analytics, which is also a strategy under RMK11\(^\text{111}\).

Highlighted roles of key stakeholders\(^\text{112}\)
Support for implementation is required from key agencies such as EPU, JKR, and the likes. Scope of support includes co-developing a mechanism for pipeline of upcoming project information to be auto-channelled to CIDB and integrating contractor and personnel information in one database.

At the same time, CIDB will continue the enhancement and automation of N3C and will collaborate with other stakeholders to co-develop a mechanism to capture the pipeline of upcoming project information to be auto-channelled to CIDB. CIDB will also publish regular forecasting of demand for construction output, materials, labour, machineries, and the like and will enhance variety and quality of data collected. Further, CIDB will integrate contractor and personnel information in one database and regularly publish analysed data and insights to deliver value to the industry. These recommendations are in line with CIDB’s mandated function to collect, distribute and maintain information on in the construction industry, in accordance with the Amendment Act 520 (2011).

The CITP recognises the need for Bumiputera contractors to develop expertise in specialist, niche trades in order to become more competitive and win high value-add jobs.

Capability building
There is a need to enhance the scale and skills development of Bumiputera and SME contractors to ensure they are competing effectively with other players in the market. The CITP seeks to enable SME/Bumiputera players to utilise and implement productivity-enhancing programmes into their business. Among the tailor-made capability-building programmes to be offered to Bumiputera contractors is the Specialist Trade programme, which will develop Bumiputera expertise in specialist, niche areas. These niche areas could potentially be aligned with growth areas identified under RMK11 such as railworks, roadworks, IBS, and oil & gas construction. The streamlining of Bumiputera contractors into certain areas to develop expertise will allow Bumiputera contractors to occupy a ‘niche’ in the industry. The construction industry is vast and broad in the scope of trades required. For smaller and subscale Bumiputera contractors, the best strategy is to respond to demand in a manageable market size or niche trade.

CITP will also extend support to Bumiputera contractors through the provision of an Entrepreneurship programme. Graduates of ABM and other training institutes will be groomed to become entrepreneurs in the industry. Tailor-made training modules will be developed, in collaboration with other relevant agencies such as Institut Keusahawanan Negara (INSKEN) and Majlis Amanah Rakyat (MARA), to transmit best practices in entrepreneurial ventures in construction.

Particular emphasis will also be placed on developing Bumiputera Facility Managers (FM). Developing expertise in facility management will be beneficial to Bumiputera as it will increase the likelihood of sustainable long-term jobs and contracts as facility management is required throughout the lifecycle of a building, rather than only during the construction stage. This will be especially beneficial in light of the initiatives to drive implementation of BIM in CITP. FM will become more relevant and will play an increasingly important role in the construction industry as the industry takes advantage of the BIM platform. Given the responsibility of FM to ensure the smooth running of buildings, FM

\(^{111}\) Strategy A3, Focus area A, Chapter 9, 11th Malaysia Plan
\(^{112}\) List of stakeholders and roles is not exhaustive
will need to be involved from the design stage of construction, where they will provide input and expertise to help avoid future maintenance problems. The development of Bumiputera FM will therefore help move Bumiputera contractors into higher value-add jobs, which will in turn enable the increase of their income and achieve national targets of higher Bumiputera equity.

**Capacity building**

In terms of scale, the facilitation fund for Bumiputera contractors, such as that managed by TERAJU, can be considered to be expanded and complemented by training to use higher-level technology. This will enable increased mechanisation and productivity gains for Bumiputera contractors.

**Opportunity creation**

The CITP will be aligned with current nationwide programmes such as the “carve-out and compete” programme where a portion of megaprojects are carved-out for Bumiputera players who compete with each other for contracts. The carve-out and compete programme will be combined with the specialist trade programme and an Entrepreneurship programme, which will develop Bumiputera contractors (focusing on G1-G3) in specialist or niche trades such as facility management, railworks, and the likes. Further, CITP recommends the formation of consortia to pool together capabilities and achieve scale in a quick, efficient manner.

**Progress monitoring**

Given the multiple overlapping Bumiputera programmes nationwide, a consistent framework on the “carve-out and compete” including its implementation will need to be introduced. At the same time, centralised
monitoring of programme success and Bumiputera performance is recommended. This could be achieved by developing, managing and tracking high-potential Bumiputera SMEs. Tracking of Bumiputera performance and progression and the set-up of a database is critical. Specifically, it is recommended for a third party independent organisation to monitor the efficacy of Bumiputera policies in the construction industry, focusing on performance elements, for example, hiring ratios, Bumiputera participation rates and so on. These performance metrics will help to track the on-going success of the programmes for potential revisions and improvements in policy-making and implementation.

**Extended support**
Beyond the programmes described above, the CITP will support Bumiputera success across other initiatives of the CITP. The CITP initiatives seek to uplift the performance of the industry in multiple dimensions. Particular emphasis will be placed on enabling Bumiputera contractors to participate in all CITP initiatives and to meet the higher standards that will be put in place.

For example, with the recommendations to increase implementation of quality assessments, including measures such as QLASSIC, there will be increased competition among contractors to produce construction works with better workmanship. The CITP will ensure that adequate training and support will be provided to Bumiputera contractors in order to help them meet these higher standards of workmanship, and achieve better QLASSIC or other quality assessment scores. Similarly, specific standards for environmental sustainability will be introduced under CITP and Bumiputera contractors will receive similar support and training to understand and meet new procurement specifications and standards. In addition, support will be provided to Bumiputera contractors to comply with increased standards for safety and workers’ amenities, which are recommended by the CITP.

Ultimately, the CITP emphasises that the programmes extended to Bumiputera have the overarching goal of developing more qualified, skillful contractors who are able to compete on a level playing field and who meet minimum requirements to be rolled out to achieve CITP outcomes.

Furthermore, these recommendations will empower and develop Bumiputera contractors to become more independent and less reliant on government projects. It is hoped that these programmes will enable Bumiputera players to compete effectively and become true contenders in the private sector.

“Unit Peneraju Agenda Bumiputera (TERAJU) shall continue to undertake various initiatives to support the growth of high-potential Bumiputera contractors in the construction industry, including though not limited to the following: extending assistance towards increasing funding opportunities; developing programmes towards upscaling and improving capacity and capability of Bumiputera contractors; and expanding participation and business opportunities for Bumiputera contractors in collaboration with relevant stakeholders, to a higher number of public- and private-sector construction projects.”

Dato’ Husni Salleh / Chief Executive Officer / TERAJU
Alignment with national programmes
Bumiputera initiatives within the CITP are aligned with the national agenda including objectives under the Majlis Ekonomi Bumiputera (MEB), and the RMK11. Specifically, the programmes for Bumiputera in the CITP are aligned with the first thrust of RMK11: ‘Enhancing inclusiveness towards an equitable society’. Within this strategic thrust, focus area E emphasises the objective to enhance Bumiputera Economic Community (BEC) opportunities to increase wealth ownership.

Highlighted roles of key stakeholders
Support for implementation is required from key agencies such as MARA, TERAJU and the likes. Scope of support includes the co-development of training curriculum content, implementation of training and accreditation and, disbursement of facilitation fund. Close collaboration will also be needed to implement the carve-out and compete programme in an effective way that ties in with the Specialist Trade programme to ensure that Bumiputera contractors are being trained in relevant trades and that they will have the opportunity to apply newly-acquired capabilities on actual projects. A concerted effort is needed to collaborate to enhance data, progress and programme monitoring.

At the same time, CIDB will co-develop the Specialist Trade, Entrepreneurship, Facility Management programmes as well as co-develop training content for machinery handling and conduct relevant train-the-trainers programmes. CIDB will also encourage matchmaking and consortia formation to enable scaling up of Bumiputera firms. Underpinning these efforts will be CIDB’s focus to continuously collaborate to enhance data, progress and programme monitoring.

“The reality is that a majority of Malay contractors are dependent on government grants. Although various policies are developed to help the Malays develop and come out of their comfort zone, the challenge would still be too great to be taken unless they learn to stand on their own feet, and not rely so heavily on the government. We need to take advantage of the opportunities in CITP to enable ourselves to become more competitive.”
Dato’ Haji Mokhtar Samad / President / Persatuan Kontraktor Melayu Malaysia (PKMM)

113. List of stakeholders and roles is not exhaustive
Case for change

Largely low-skilled workforce and inadequate or mismatch in training and development

- Workforce with limited skills
- Mismatch in training provided and skills required

Initiatives

Continue investment in human capital development in construction

- Streamline construction-related training and development courses
- Improve curricula through content development with industry participation
- Improve quality of training and trainers
- Fill gaps in construction-related courses

Key outcomes by 2020

- Streamlined training programmes nationwide
- Qualifying training institutions accredited
- More than 15,000 on-the-job apprentices produced
- More than 10,000 supervisory and management personnel (including QA/QC, site safety and the likes.) trained and certified
- More than 50,000 construction personnel completed Continuous Professional Development training
- More than 30,000 graduates in construction-related skills, supervisory and management training trained and certified

Highlighted roles of key stakeholders

- Key stakeholders: MOE, MOHR, TEVT institutes, and the likes
- Scope of support:
  - Share of information, data, expertise and input to develop world-class training and curricula content for the construction workforce
  - CIDB role:
    - Enhance existing accreditation and certification mechanisms, review and audit construction-related courses and develop clear training guideline map, containing an identification matrix of recommended institute or training providers by training course and specific skills
    - Lead the establishment of a Technical Advisory Committee to review training courses in Malaysia and identify Areas of Expertise for each training provider

Over-reliance on low-skilled foreign labour

- High proportion of unskilled foreign labour
- Relatively low cost to industry to procure foreign, low-skilled labour

Enhance control and balance of workforce supply

- Introduce manpower planning to match supply and demand
- Introduce tiered visa programme to raise skills mix of foreign workers

Key outcomes by 2020

- Construction manpower supply and demand conducted annually
- Proportion of skilled : unskilled foreign labour increased from 5 : 95 to 15 : 85
- Tiered-visa programme implemented
- At least two assessment centers in major foreign worker source countries established
- All skilled workers and supervisory personnel accredited

Key stakeholders:

- EPU, MOHR, MOFA, Immigration Department of Malaysia, and the likes
- Scope of support:
  - Integrate the agenda for demand-supply planning into the HCDC
  - Conduct analyses to forecast and monitor manpower demand-supply model
  - Report on manpower demand-supply for planning and implementation

Not Exhaustive
## Key Outcomes by 2020

- **Limited adoption of modern practices, mechanisation, and IBS**
  - The current definition of components qualifying as IBS is vague
  - Contractors risk cash flow issues during procurement of IBS components
  - Relatively high import duty for IBS manufacturing equipment and installation machinery
  - Insufficient number of design consultants for IBS

- **Accelerate adoption of IBS, mechanisation, and modern practices**
  - Harmonise IBS catalogue
  - Conduct cost-benefit analysis for IBS adoption to increase buy-in from key stakeholders
  - Separate procurement of IBS components from main contract
  - Incorporate IBS into PAPs
  - Introduce economic mechanisms to drive scale
  - Heighten monitoring of compliance with MOF Circular 1PPL 1/2013

- **A minimum number of economic mechanisms introduced**
  - IBS components for public projects to be procured separately from main contract
  - Number of IBS plants increased
  - New Development Order issued in Klang Value that incorporate requirement for 50 IBS score for large projects increased
  - Number of large projects in three states that achieve minimum 50 IBS score increased
  - 100% compliance to amended MOF Circular 1PPL 1/2013

- **Highlighted roles of key stakeholders**
  - Key stakeholders: MOF, PR1MA, MITI, ICU, JKR, KPKT, and the likes
  - Scope of support:
    - Review and consider the amendment of procurement practices for public projects to separate IBS procurement from main contract
    - Increase targeted training sessions for design consultants
    - Heighten enforcement of IBS adoption and compliance with MOF Circular SPP Bil. 7 2008

---

## Over-reliance on low-skilled foreign labour [cont’d]

- Implement of a tiered-visa programme for foreign construction workers
- Consider the establishment of assessment centres at source countries to determine skill levels prior to entering Malaysia

## CIDB role:
- Integrate the agenda for demand-supply planning into HCDC
- Set up collaboration opportunities with universities
- Train providers, and source countries to review training gaps and identify key resolutions
- Provide inputs to MOHR and key agencies on manpower demand-supply for planning and implementation
- Enhance accreditation of qualified workers, contractors and personnel
- Participate in working group to define categories for different visa tiers tied to skill level

---

## Case for change

- Consider the establishment of assessment centres at source countries to determine skill levels prior to entering Malaysia

## Initiatives

- Review and consider the amendment of procurement practices for public projects to separate IBS procurement from main contract
- Increase targeted training sessions for design consultants
- Heighten enforcement of IBS adoption and compliance with MOF Circular SPP Bil. 7 2008
**Case for Change**

Limited adoption of modern practices, mechanisation and IBS (cont’d)

**Initiatives**

- Roll out technology advantage across project life-cycle
  - Facilitate IT advantage via licensing of BIM software
  - Introduce BIM guide with IBS-harmonised library
  - Introduce BIM-ready permit submission and approval issuance process
  - Facilitate Local Authorities adoption of ICT to enable error-checking of construction project plans

- BIM standard object library fully operational
- At least 50 approved construction-related modules available online
- Two Malaysia based technologies (in modern methods, materials) developed for national implementation
- Competency Management System (CMS) operational and personnel profiles in all critical trades uploaded to database
- At least 40% BIM implementation rate achieved for large public projects
- 1,000 BIM personnel trained and certified
- A minimum number of PhD programmes in modern technology partnered with local universities

**Key outcomes by 2020**

- Quarterly Report on adoption of IBS submitted for Action taken on non-compliance to IBS adoption based on Quarterly Report as submitted to MOF and AG
- IBS and Modular Coordination incorporated into PAPs
- Number of personnel competent in IBS design for manufacturing and assembly (DFMA) increased

- Amend PAPs to incorporate IBS and modular coordination and with KPKT and state governments to ensure enhancement on UBBL to facilitate adoption of IBS

**Highlighted roles of key stakeholders**

- Key stakeholders: KPKT, JKR, global BIM experts and the likes
- Scope of support:
  - Co-developing a national BIM guide and standard to ease BIM adoption
  - Co-develop national BIM guide and standards as well as develop a BIM roadmap for Malaysia

**Highlighted roles of key stakeholders**

- CIDB role:
  - Undertake a cost-benefit analysis for adoption of IBS and finalise tax incentive proposals
  - Contribute by engaging stakeholders to facilitate changes in practices and regulations and provide input into the design of economic mechanisms to reduce price of IBS machinery and equipment
  - Provide input into design of economic mechanisms to encourage growth in IBS manufacturers and suppliers

**Limited adoption of information technology such as BIM**

- Lack of required talents in Malaysia – small proportion of workforce are able to prepare plans in BIM and effectively utilise it
- High cost of adoption
- Implementation complexity
- Requires changes to the current ways of working
- Lack of a standard object library
- Lack of guidelines
- Local authorities not fully equipped in terms of hardware and software
- Local authority staff not fully trained
- Requires collaboration and integration

**Limited adoption of information technology such as BIM**

Not Exhaustive
Four Strategic Thrusts

**Case for change**

Limited adoption of information technology such as BIM (cont’d)

Lack of data- and information-driven decision-making
- Lack of access, accuracy, breadth and depth of industry data

Enhance availability of strategic information via NCIIC
- Enhance data collection and analyses
- Consolidate disparate databases
- Provide pipeline data to facilitate effective business planning

**Key outcomes by 2020**

- Cradle to Cradle framework for Circular Economy in construction launched
- At least 10,000 registered companies (as users) on N3C portal
- A minimum number of unique visitors and registered users of NCIIC achieved
- Lifecycle costing information regularly published
- Tender price indices regularly published
- Output indices regularly published
- Pipeline of projects available online

**Initiatives**

- Design and conduct awareness programme on cradle-to-cradle design and circular economy via the BIM reference centre
- Conduct research and programmes to promote mechanisation and adoption of construction IT

**Highlighted roles of key stakeholders**

- Key stakeholders: EPU, JKR, and the likes
- Scope of support:
  - Co-developing a mechanism for pipeline of upcoming project information to be auto-channelled to CIDB and integrating contractor and personnel information in one database
  - CIDB role:
    - Enhancement and automation of N3C and will collaborate with other stakeholders to co-develop mechanism for pipeline of upcoming project information to be auto-channelled to CIDB
    - Publish regular forecasting of demand for construction output, materials, labour, machineries, and the like and will enhance variety and quality of data collected by CIDB
    - Integrate contractor and personnel information in one database and regularly publish analysed data and insights to deliver value to industry

Not Exhaustive
Sunway Construction Group is always at the forefront of technology application and innovation in the construction industry. In addition to the substantial investments in sophisticated plant and heavy construction machinery, it has embarked on the use of Building Information Modelling and latest Virtual Design and Construction System. This is in line with the Group’s policy of continuous improvement or ‘Kaizen’ in enhancing productivity and competitiveness.

**Case for Change**

- High proportion of subscale SMEs, including Bumiputera SMEs and entrepreneurs
  - Majority of SMEs and Bumiputera have relatively low productivity levels
  - Only small proportion of Bumiputera contractors are involved in future growth areas such as in railworks, IBS and oil & gas related construction
  - Large number of Bumiputera firms lack scale
  - Limited opportunities for Bumiputera firms to increase capability and capacity

**Initiatives**

- Advance SME / Bumiputera capacity and capability-building
  - Enhance up-skilling of Bumiputera companies
  - Develop specialist trade contractors in future growth areas
  - Create opportunities for Bumiputera companies via extension of carve-out and compete programme
  - Enable further mechanisation of Bumiputera firms

**Key outcomes by 2020**

- Number of Bumiputera contractors trained and certified under the Continuous Development Programme increased
- Number of Bumiputera contractors trained and meeting minimum requirements to become Facility Management Contractors increased
- Number of Bumiputera contractors trained and certified in IBS installation overall increased
- Overall specialisation of Bumiputera contractors in key growth areas via specialist trade programme improved
- Number of construction-specific Bumiputera companies supported by Facilitation Fund increased

**Highlighted roles of key stakeholders**

- Key stakeholders: MARA, TERAJU and the likes
- Scope of support:
  - Co-develop training curriculum content, implement training and accreditation and, disburse facilitation fund
  - Implement the carve-out and compete programme in an effective way
- CIDB role:
  - Co-develop the Specialist Trade, Entrepreneurship, Facility Management programmes
  - Co-develop training content for machinery handling and conduct relevant train-the-trainers programmes
  - Encourage matchmaking and consortia formation to enable scaling up of Bumiputera companies

*Not Exhaustive*
The Internationalisation Thrust aims to develop Malaysian champions to lead the charge locally and globally. Key outcomes of the Internationalisation Thrust by 2020 include 10 companies to achieve 5* SCORE rating, 50 Malaysian companies to earn G8 status, and 10 more construction-related companies exporting construction services in the global market.

There are three critical issues to be addressed under the Internationalisation Thrust:

- Increasingly competitive domestic market, especially with the presence of foreign players
- Limited access to enablers to support international expansion, including financing
- Limited number of Malaysian players participate in construction projects abroad

The CITP aspires to tackle these issues with three key Internationalisation initiatives:

- Initiative I1: Internationalise construction practices and standards
- Initiative I2: Strengthen access to financing for Malaysian champions going abroad
- Initiative I3: Support consortia formation and strengthen overseas market intelligence
Malaysian champions: leading the charge locally and globally

**Outcomes**

By winning back market share domestically and competing in overseas markets, Malaysian champion companies will contribute to the High Income goal. Internationalisation will support the export of services.

**Case for Change**

Increased need for Malaysian companies to hold ground against foreign competitors

- Malaysian companies need to be ready for greater competition and scrutiny
- New FTAs’s planned (e.g., TPPA²) in addition to current 12

~70% decrease in value of overseas projects won

**Overseas projects won**

RM 5.8 Bn (2011) vs. ~RM 0.25 Bn (2014)

Erosion of domestic construction share of local companies

Losing domestic market share to foreign companies, 12% (2012) vs. 22% (2014)

**Highlighted Recommendations**

Internationalise construction practices and standards

- Recommend Malaysian Standard for construction specifications for all projects
- Encourage adoption of international standards for materials, workmanship, safety, methodology, etc.

Strengthen access to financing for Malaysian champions going abroad

- Provide interest rate cushion for overseas financing³
- Extend working capital guarantee scheme

Support consortia formation and strengthen overseas market intelligence

- Ensure focused targeting of high potential export markets
- Facilitate consortia formation to promote scale

---

1. Free Trade Agreement
2. Trans-Pacific Partnership Agreement
3. In compliance with WTO regulations
4. Not exhaustive
Case for change

INCREASINGLY COMPETITIVE DOMESTIC MARKET, ESPECIALLY WITH THE PRESENCE OF FOREIGN PLAYERS

In recent years, foreign companies have been winning an increasing number and value of projects in the domestic market. From 2013 to 2014, foreign contractor market share increased by 10 percentage points\textsuperscript{115}. About 60% of the value of these foreigner contracts is in the industrial segment\textsuperscript{116}. Contractors from Japan account for the highest proportion of foreign contractor market share, with a total of RM 39.1 Billion worth of projects in the period 2008-present, as shown in Figure 45.

Among the largest construction projects awarded in 2014 to foreign contractors is the Steam Cracker Complex for RAPID project, which is worth RM 7.5 Billion. Another key project is the Onshore Gas Terminal project in Terengganu worth RM 2.3 Billion\textsuperscript{117}. Apart from specialised and highly technical projects, foreign players are also increasingly gaining ground across various types of projects in Malaysia. The gradual increase in foreign players’ market share over the last few years indicate the need to continuously enhance the capabilities of local players to remain competitive and be up to the mark, as compared to the foreign competition.

Another key consideration is the opening up of the Malaysian market due to globalisation and the signing of Free Trade Agreements (FTAs). Malaysia has signed a significant number of FTAs (as shown in Figure 46), which create growth opportunities and provide Malaysian companies with the opportunity to be part of a larger market. However, free trade also removes any barrier against incoming competition, thus increasing the competitive landscape.

\textsuperscript{114} CIDB statistics, 2015
\textsuperscript{115} Increase in market share largely driven by RM 5.7 Billion Liquefied Natural Gas (LNG) Plant in Sarawak
\textsuperscript{116} CIDB statistics, 2015. Based on 2014 data
\textsuperscript{117} Asia Construct Conference, Malaysia Country Report 2014
**Figure 45** Projects by foreign contractors (2008-2015)**18**

![Bar chart showing projects by foreign contractors (2008-2015)]

**Figure 46** To-date, Malaysia has signed 12 FTAs

Malaysia has signed 12 FTAs, of which 11 were in the past 10 years.

**Broad objectives of FTAs**

1. Seek better market access by addressing tariffs and non-tariff measures
2. Further facilitate and promote trade, investment and economic development
3. Enhance the competitiveness of Malaysian exporters
4. Build capacity in specific targeted area

118. CIDB statistics (cumulative), 2008-2015, as of March 2015
Several new FTAs are under discussion to add to the current 12 in effect, most notably the Trans-Pacific Partnership Agreement (TPPA). This will further intensify competition. Malaysian companies will need to be more ready for greater competition and scrutiny and will need to prepare themselves to hold ground against foreign competitors.

Malaysia has since raised its concerns on the implications of TPPA on various policies and is in the midst of negotiations. However, even if Malaysia is successful in negotiating the scope of commitments in TPPA to allay competitive forces temporarily, pressure to sign agreements such as the TPPA will only grow with time as we continue to globalise and liberalise. The pressure to comply with agreement terms will also grow. The opening of markets with the proliferation of FTAs thus puts pressure on Malaysian construction industry players to increase performance and become more competitive.

At the same time, Malaysian players need to become familiar with international standards and specifications in terms of building materials, quality, workmanship, standards for safety, sustainability and civil engineering works nationwide, and the likes. Currently, standards and specifications used by the industry are fragmented – various players use multiple differing standards and specifications. Furthermore, current adherence to international standards remains rather limited for most local players. Thus the signals of world-class compliance to clients who demand them are rather limited from Malaysian companies and this issue needs to be addressed in order to become more competitive.

**LIMITED ACCESS TO ENABLERS TO SUPPORT INTERNATIONAL EXPANSION, INCLUDING FINANCING**

Gaps in overseas financing from both private and government sources have been cited as a key challenge for Malaysian companies in winning overseas projects and securing working capital overseas. This is particularly real in target markets that require instruments such as performance and bid bonds.

On the overseas front, EXIM Bank provides financial assistance for overseas projects in terms of overseas credit and guarantee facilities. However, public sector funding remains low due to limits often imposed on country and company. Large firms also face challenges in obtaining loans for projects, particularly in high risk countries that may be among Malaysia’s target overseas markets.

In terms of the domestic market, private sector financing issues are also often encountered by both large players and SMEs. SMEs typically face difficulties in meeting loan risk assessment criteria. They also face challenges in accurately assessing, forecasting and planning project finance requirements. This affects their cash flow management.
“Market intelligence plays a very vital role in strategic decision making where it provides the needed information on opportunities and challenges. It gives us a competitive edge especially through detailed understanding of the constraints posed by the market or project.”

Mr. Liew Hau Seng / Managing Director / IJM Construction Sdn Bhd

and increases the risk of projects running into losses before project completion. This situation further affects the credibility of players when seeking future project financing.

On the lending front, financial institutions often face difficulties in risk assessment due to limited information on construction company performances. This can affect their ability to conduct credible credit evaluations.

LIMITED NUMBER OF MALAYSIAN PLAYERS PARTICIPATE IN CONSTRUCTION PROJECTS ABROAD

Malaysian companies have had success stories in the overseas market, with a strong presence in the Middle East and an increasing presence in Africa and Central Asia. Malaysian players secure a wide range of projects across the globe, including residential projects, civil works, roads and highways, oil and gas, energy, bridges, mixed developments, and the likes. The value of overseas projects won by Malaysian contractors has however, declined from RM 5.8 Billion in 2011 to RM 2.7 Billion in 2013 and RM 0.2 Billion in 2014 (see Figure 47).

While this is partly due to strong domestic demand for construction (resulting from large megaprojects such as the KVMRT), it is important for Malaysian firms to maintain long-term presence abroad building networks, gaining experience and establishing relationships so as to be able to continue to benefit from a thriving global construction market and not being overly reliant on the Malaysian market alone.

In addition to gaps in financing, lack of market access and sparse market intelligence are often cited as reasons for Malaysian companies not being able to effectively secure projects overseas. Exporting is not a straightforward process and Malaysian companies going abroad have cited the lack of market intelligence as being a key factor reducing their competitiveness in project bidding. Malaysian companies often bid for projects which require a high-level of local understanding, knowledge, and familiarity. Even for companies who have successfully won projects, the lack of market intelligence becomes a challenge throughout construction as a deeper understanding of the local environment, landscape, processes, regulations and politics allows for the maximisation of results and the minimisation of risks.

Figure 47 Fall in overseas project value, 2011-2014

119. CIDB statistics (2015)
120. CIDB statistics
Initiatives

Malaysia has embarked on enhancing market access through strong government-to-government (G2G) relations, industry promotion and establishing strong market knowledge. However, to unlock the full potential of the global construction market, there is a critical need to address gaps in domestic capability and improve access to financing within the domestic and overseas market. Based on three issues outlined in the previous section, three key initiatives are recommended.
As we create, enhance and strive to sustain our country’s natural and built environment we need to build more world class projects. The integration to a Malaysian Standard for construction specifications will uplift the performance of the construction industry’s players and stakeholders and thereby achieve excellence in project delivery. Ultimately with the improvement in the construction industry’s performance and culture we will internationalise our services and improve the wellbeing of the rakyat who are the primary users of the built environment.”

Dato’ Srikandan / Managing Director / KPK Quantity Surveyors & Board Member / Construction Industry Development Board (CIDB)

**Initiative I1**
Internationalise construction practices and standards

**Introduce Malaysian Standard for construction specifications**
There is a clear impetus for Malaysian construction companies to increase global competitiveness to capitalise on new market growth opportunities and to retain market share domestically. Even at home and in developing markets where Malaysian companies may have a competitive advantage, these companies must increase their competitiveness in response to foreign competitors. For instance, SMEs in the industry need to become more export-oriented and change their perspective to become more global. Based on this, CITP proposes an arsenal of initiatives to raise the performance of construction players to international levels.

As a first step towards raising the performance of local players, CITP recommends the compilation, integration and consolidation of the various specifications (whether international, regional, national and even company standards where relevant) that are used in Malaysia today, which will result in the development and publication of a Malaysian Standard for construction specifications. This move will also integrate standards to become more holistic. It will also reduce discrepancies, uncertainty and fragmentation and will enhance uniformity of specifications used in Malaysia. The Malaysian Standard will encompass a wide range of specifications including quality, material standards, safety, environment, methodology, and the likes. The publication of the Malaysian Standard will serve as a public reference and guideline for the industry to base practices on. The document will act as a one-stop information source that will enable industry players to quickly and accurately develop specifications that comply with a certain minimum standard. The Malaysian Standard for construction specifications will add value to construction projects as it will lead to efficient cost reductions and lower wastage. It will therefore contribute towards raising the quality and performance of domestic consultants and projects. Ultimately this standardisation contributes to an equalisation of the playing field for local players against foreign competition bidding for Malaysian projects. This ability to maintain competitiveness on the home turf contributes to the outcomes of the Internationalisation Thrust of CITP.

To aid in the take-up of these standards, it is recommended that financial institutions such as banks consider including clauses in loan agreements to encourage usage of the Malaysian Standard for construction specifications for large project financing. In addition, banks can help to raise adherence to standards by demanding higher standards to increase visibility, quality, safety, and workmanship. A further benefit of having the Malaysian Standard for various construction specifications is it can be integrated into the BIM platform, thereby aiding consultants to complete the design stage of a building. It will reduce the amount of time spent on manually checking construction specifications to ensure compliance.
**Heighten enforcement of compliance to mandatory material standards**

Another key element of internationalisation of construction practices is to have more stringent enforcement of material standards. It is recommended that CIDB and SIRIM Quality Assurance Services (QAS) expand the breadth of materials that require QAS certification and also help to drive poor quality materials out of the market. An online system for certification of local and imported products will be established to increase the visibility of material standard requirements. Material enforcement officers will be trained, certified and deployed to monitor compliance with material standards. Royal Malaysian Customs Department can also assist to ensure non-compliant materials are not imported into Malaysia. These recommendations will lead to the use of high quality materials in construction and thus improve structural safety of construction works. At the same time, this recommendation aims to drive low quality and illegal materials out of the Malaysian market by imposing a ban on the import of materials that do not meet the CIDB construction material standards.

**Enhance and expand adoption of Malaysian Civil Engineering Standard Method of Measurement**

It is also recommended that the adoption of CIDB-led Malaysian Civil Engineering Standard Method of Measurement (MyCESMM) be extended nationwide and for it to be converted to a Malaysian Standard. MyCESMM serves as a guideline for standardisation of measurements and terminology used in the Bill of Quantities for civil engineering projects in Malaysia. It seeks to eliminate misunderstandings among all parties, increase competitiveness among tenderers, create quality documents using a coherent ‘language’ for the construction industry and potentially minimise claims due to variations (with non-standardised method of measurement currently accounting for up to 86% of total value of claims due to variation\(^{121}\)). The use of MyCESMM/MS CESMM will enhance efficiency, communication, reliability, reduce uncertainties and more importantly, enable firms to compete on a global scale and in a level playing-field within Malaysia.

---

**Benchmark 15**

**ENFORCEMENT OF MATERIAL STANDARDS IN KOREA, GERMANY AND CHINA**

South Korea has launched a nationwide campaign to eradicate forged material quality certifications. The Korean Industrial Standards (KS) classify the quality of materials across 21 sectors including construction, metal, ceramics, chemicals, and the likes. The Construction Technology Promotion Act requires all steel products to be KS tested, and builders to only use KS-certified products. Yet, despite the introduction of the Act, unqualified products have been sold in the market with forged KS certifications.

In response, South Korea launched a nationwide audit to find and penalise those who manufacture, distribute and use materials with forged certifications. The audit spanned from manufacturers to both large and small distributors.

In Germany, municipalities carry out spot checks on building sites to audit the compliance to regulations and standards, particularly for environmental measures. Non-compliant companies are penalised with a fine ranging between €5,000 and €50,000.

Local Authorities in China audit construction sites for compliance to regulations and standards. To ensure thorough coverage, Local Authorities sometimes hire third party inspectors for the audit work.

---

Sources:

\(^{121}\). Source: Urusetia Perubahan Kerja dan Tuntutan JKR between 2007 - 2011
Alignment with national programmes
Initiative I 1 contributes to the second thrust of RMK11: ‘Improving wellbeing for all’. Uplifting various standards in construction to international standards will result in a built environment that is of high quality for the rakyat.

Highlighted roles of key stakeholders
Support for implementation is required from key agencies such as JKR, MOF, BEM, LAM, BQSM and associations and SIRIM. Scope of support includes to enable the roll-out of public and private sector adoption of National Standard Specifications to establish an online system for certification of local products, compliance with material standards and verification, and demonstration of MyCESMM/MS CESMM through public projects.

At the same time, CIDB will also compile and consolidate various specifications used in the industry to develop construction specifications. Beyond that, it will co-establish an online system for certification of local products, compliance with material standards and verification, and demonstration of MyCESMM/MS CESMM through public projects.

INITIATIVE I 2
Strengthen access to financing for Malaysian champions going abroad
CITP recommends the strengthening of access to enablers for international expansion in order to meet its goals of developing Malaysian champions. Malaysian champions in construction are those that have high performance levels and are able to compete effectively abroad. Two parallel forms of support are required: support for champions and the development of a pipeline of smaller players who can be future champions.

With regards to players who can be groomed as champions, CITP recommends strengthening access to financing. This includes enhanced access to project financing, especially for overseas projects, and continued provision of grants for feasibility studies. This will enable Malaysian companies to expand their footprint overseas, accelerate their growth and exposure, build their brand and win overseas contracts, which can potentially increase income to Malaysia. It is further recommended that preferential interest rates be extended to champion Malaysian companies in order to match price competitiveness of other country bidders tendering for projects or contracts overseas. This can be offered in conjunction with EXIM Bank’s Buyer Credit facility, which is a financing scheme extended to foreign buyers or importers who buy Malaysian goods and services. Taken together, these programmes will help to bridge the gap in foreign financing available to Malaysian companies to increase their presence abroad.

Beyond the support in obtaining project financing, other forms of support will be provided to Malaysian champions to increase access to enablers for international expansion. An example of such support is the advisory services to companies to remedy deficient SCORE ratings, as described in Initiative Q3. Another example is the strengthening and distribution of market intelligence, the maintenance of the “Going Global” directory and support for consortia formation, among others, as described in Initiative I 3.
At the same time, CITP hopes to stimulate the individual growth of SMEs to strengthen the pipeline of potential future champions. This can be done by providing financing to improve productivity and innovation among SMEs. Feasibility study grants, in line with the Services Export Fund under MATRADE, will greatly enable Malaysian professionals (a large proportion of which are SMEs) to both gain experience and deepen their knowledge in foreign markets, filling a missing market in feasibility grants.

Beyond that, banks will be encouraged to leverage the MOF Skim Jaminan Pembiayaan Perniagaan (SJPP), a working capital guarantee scheme, to increase the pool of financing available to SME construction players who face challenges in meeting loan criteria. The mechanism by which SJPP works is described in Figure 48.

**Alignment with national programmes**
This initiative is aligned with key national-level programmes such as the Services Sector Blueprint where Internationalisation is a key strategy. In particular, the Services Sector Blueprint emphasises the need to address

---

**Benchmark 16**

**COST-SHARING FEASIBILITY STUDY GRANT IN SOUTH AFRICA**

South Africa has developed a cost-sharing feasibility study grant to increase local exports of goods and services. It is called the Capital Project Feasibility Programme, which facilitates feasibility studies that are likely to lead to high-impact projects. This will stimulate value-adding economic activities in South Africa. The programme subsidises up to 50 per cent of overseas project costs or export feasibility study expenses. A minimum requirement of 50 per cent of local content for goods and 70 per cent for services is required.


---

**Figure 48 Working capital guarantee scheme structure**
funding gaps for Malaysian companies, including in construction. The initiative will be aligned with the National Export Strategy, developed by the National Export Council, which has been tasked to further stimulate export growth by facilitating cross-ministry policy coordination and implementation. Outcomes of Initiative I2 will contribute towards the RMK11 thrust ‘Re-engineering economic growth for greater prosperity’. A key focus area under this thrust is ‘expanding modern services’: RMK11 focuses on the development of subsectors and industries that are tradeable, have high knowledge intensity and linkages with the rest of the economy. In addition, professional services, including in construction, is a key subsector that will be expanded under RMK11.

Highlighted roles of key stakeholders

Support for implementation is required from key agencies such as EXIM bank, MATRADE and MOF. Scope of support includes disbursement of feasibility study grants, review possibility of tax mechanisms for feasibility studies and other financial products in construction and disbursement of loan interest rate cushion fund to eligible companies.

At the same time, CIDB will conduct a detailed assessment of financing gaps faced by large construction players and SMEs who export or have the potential to export and promote funding support programmes to large players and SMEs. These recommendations are in line with CIDB’s mandated function to advance, encourage and support the exportation of Malaysian construction services, in accordance with the Amendment Act 520 (2011).

Benchmark 17

PROJECT BUNDLING BY THE SWEDISH GOVERNMENT

The Swedish Government uses public spending to support the build-up of large, capable companies. They introduced project ‘bundling’ to build-up large, capable companies, as projects were bundled and handed out to only a few select firms. During the period of 1961-1975, some 75 per cent of the multi-family dwellings built in Sweden were standard buildings, and four or more of the same buildings were built by the same contractors. Skanska and NCC Group were two of the main contractors involved, and due to the opportunities in the period 1961-1975, they were able to go on to expand into residential and non-residential businesses across the globe. Without the Swedish Government’s move to bundle these standard family building projects together, Skansa and NCC Group may not have had opportunities to build specialisation capabilities and capacity, thereby growing to become industry champions.

Today, Sweden’s top three companies are globally competitive and dominating the market. Swedish industry is still led by the top three firms who drive innovation and standardisation throughout the value-chain. Skansa, NCC Group and Peab collectively have more than 60 per cent share of the market, and are also big players in neighbouring Nordic nations. Skansa is also heavily invested in BIM and modular or prefabrication techniques.

Sources:
1. NCC Annual Report 2014. (http://ncclimited.com/)
4. NCC. (http://www.ncc.se/)
5. Skanska (http://group.skanska.com/)

124. List of stakeholders and roles is not exhaustive
Case Study 5

IJM-SUNWAY-ZELAN-LFE CONSORTIUM IN ABU DHABI, UNITED ARAB EMIRATES

Al Reem Island Project is a USD 30 Billion mixed-development project on a natural island in Abu Dhabi, United Arab Emirates. The development is one of the largest construction projects in Abu Dhabi and will include a business district, a commercial district and a residential district. The 6.5 million square meter island is being built by three developers, one of which is Tamouh Investments LLC.

In mid 2006, Tamouh Investments awarded a portion of the project to the IJM, Sunway, Zelan, LFE Consortium (ISZL) from Malaysia. The project consists of the design, execution and completion of five towers and seven villas with a total Gross Floor Area of 292,937 square meters.

While all development activities on the island slowed down as a result of the global financial crisis, the progress on projects has begun to pick up again. In 2009, the ISZL Consortium project was half complete and is targeted to complete in the next few years.

The project is a significant achievement for Malaysian players abroad. The exposure gained through this megaproject has benefitted the consortium members. In particular, it would have been relatively difficult for any individual member of the consortium to secure the project without the consortium. The ISZL Consortium’s collaboration on the Al Reem Island Project demonstrates the positive impact of consortium synergies and the potential for growth of Malaysian champions.

“The consortium has been a mutually supportive and beneficial arrangement where ‘competitors’ can blend together by forming professional collaboration in overseas ventures, capitalising on each others’ strengths.”

Mr. Liew Hau Seng / Managing Director / IJM Construction Sdn Bhd

Sources:
Ensure focused targeting of high potential export markets

CITP proposes the importance of having strengthened bilateral relations with target export markets and increased prioritisation and efficiency in resource allocation for export-ready firms. CIDB and MATRADE will collaborate under the National Export Strategy led by the National Export Council to raise the number of fact-finding missions in order to strengthen business networking and engagements.

To support efforts by CIDB and MATRADE to increase Malaysian presence overseas, individual companies are encouraged to develop comprehensive market entry strategies. There are three broad steps to develop such an internationalisation strategy, as shown in Figure 49.

**Figure 49 Three-step approach to develop internationalisation strategy**

1. **Target markets based on high growth and size**
   - Identify highest growth regions
     - 10-yr projected growth
   - From shortlist of high growth regions, identify high growth countries
     - 10-yr projected growth
     - Current total output
   - Shortlist of target markets

2. **Prioritise market based on relative advantage and risk**
   - Assess at high-level shortlisted markets based on:
     - **Malaysia’s relative advantage**
       - Cost advantage, capability, relationship, market fit
     - **Country risk assessment**
       - Ease of doing business
       - Corruption index
   - Top three priority target countries

3. **Define entry strategy**
   - Evaluate entry options for priority target markets
     - Evaluate market segments
     - Evaluate market entry method (e.g. stand-alone, JV, acquisition etc.)
   - Assess key risks, opportunities and potential mitigations
   - High level market entry opportunity by target country
The first step is to develop a shortlist of target markets based on high growth and size. The shortlist can be developed by identifying the highest growth regions based on a 10-year projected growth and considering the market’s current total output. The second step is to prioritise markets based on Malaysia’s relative advantage and risk. Factors affecting relative advantage include relative cost advantage, capability, relationship, and market fit. On the other hand, factors affecting the market’s relative risk include, for example, the ease of doing business in the country and its corruption index. Finally, the third step is to define entry strategy by evaluating entry options for priority target markets, evaluating its market segments and evaluating the market entry method (whether this be a stand-alone, joint venture, acquisition, or other methods of entry). It is also important to assess the key risks, opportunities and potential mitigations of the venture. The expected outcome is a high level market entry opportunity by the target country.

Beyond this, it is recommended that the Malaysian Construction Industry Excellence Awards be hosted to drive competitive spirit and reward Malaysian champions both domestically and internationally. GB companies will be supported in overseas ventures and will be consulted to design the agenda for trade missions. These missions will include engagements with potential clients in the target market, organised via Malaysian Embassies in those countries and in collaboration with MATRADE representatives.

Together with an increased participation in targeted international construction forums such as conferences and competitions, Malaysian construction companies will not only be presented with opportunities to showcase but also to expose Malaysian players to the qualities of its competitors, allowing them to learn best practices and raise market intelligence in preparation for overseas bids.

The Internationalisation Thrust aims to strengthen the pipeline of export-ready players, with Malaysian champions leading the charge locally and globally. This initiative fosters consortium synergies, encourages innovation and knowledge sharing, provides opportunities for SMEs and large players to leverage the consortium brand. It offers the scale to secure financing and win projects and has the potential to increase national income from overseas projects. It also targets an overall increase in the value and number of projects won abroad, especially in the target markets. This move aims to strengthen trade relations with target export markets and therefore the potential to increase national income from target overseas markets and the potential for spill-over effects to other export goods and services. It also provides an increased focus and efficiency in resource allocation. This initiative also envisions more targeted and effective efforts in providing trade and marketing support, trade advisory and trade finance services. In addition, it aims to impact a wider group of stakeholders. SMEs also benefit from this initiative as strong bilateral relations forged can increase the ease of access for SMEs to high-potential markets such as opportunities to partner with existing Malaysian players in target markets.

“The Malaysia External Trade Development Corporation (MATRADE) as the national trade promotion agency, will continue to support the internationalisation of Malaysian construction companies and other related services sector globally. Malaysian companies must endeavour to adopt an integrated approach in pursuing business overseas, offering a competitive and innovative total solution package using products, services and technologies from Malaysia.”

Dato’ Dzulkifli Mahmud / Chief Executive Officer / Malaysia External Trade Development Corporation (MATRADE)

---

125. New category of high performing construction players to be introduced and described in Initiative Q3
“On liberalisation and internationalisation, the Board of Architects Malaysia believes that Architects need to be more proactive and establish presence and branding globally.”
Ar. Datuk Prof. Dr. Amer Hamzah Mohd Yunus / President, Board of Architects Malaysia (LAM)

Alignment with national programmes
Initiative I3 is aligned with key national-level programmes such as the Services Sector Blueprint, which emphasises the importance of Internationalisation as a key policy lever. The initiative is also aligned with the National Export Strategy, developed by the National Export Council, which has been tasked to further stimulate export growth by facilitating cross-ministry policy coordination and implementation. RMK11 emphasises the need to for construction companies to build capability and scale in niche areas through partnerships with larger corporations or form multidisciplinary consortia when bidding for projects both domestically and internationally126.

Highlighted roles of key stakeholders127
Support for implementation is required from key agencies such as EPU, EXIM Bank, MATRADE. Scope of support includes encouraging bundling of public projects to facilitate consortia formation, co-development and maintenance of “Going Global” directory to provide comprehensive information and guidelines for export of Malaysian construction services, and co-development of a targeted internationalisation and market entry strategy, including enhancing market intelligence for target markets and evaluating opportunities against Malaysian capabilities. CIDB will place particular emphasis on co-developing a targeted internationalisation and market entry strategy, including enhancing market intelligence for target markets and evaluating opportunities against Malaysian capabilities. CIDB will continue to facilitate project bidding and advise players vying for international projects and will encourage successful players to share experiences with smaller players venturing overseas. These recommendations are in line with CIDB’s mandated function to advance, encourage and support the exportation of Malaysian construction services.

At the same time, CIDB will define target construction sectors such as infrastructure, energy, residential projects, and the likes, as well as the type of consortia, key support required, market awareness and

126. Strategy A5, Chapter 8, 11th Malaysia Plan
127. List of stakeholders and roles is not exhaustive
### Case for change

Increasingly competitive domestic market, especially with the presence of foreign players

- Need for global competitiveness with increasing globalisation, including potential entry into TPPA
- Limited exposure to and adoption of international standards
- Fragmentation in specifications and standards used by various players
- Lack of minimum standards in specifications and materials

### Internationalise construction practices and standards

- Contractually adopt Malaysian Standard for construction specifications
  - Collate best practices around the world and domestically to develop the national standard
- Heighten enforcement of compliance to material standards in accordance with the Amendment Act 520 (2011)
  - Increase quality and quantity of material verification officers
  - Establish online system to verify material compliance with minimum standards
- Expand adoption of MyCESMM to increase standardisation of the method of measurement used in civil engineering projects in Malaysia

### Initiatives

- Comprehensive list of Malaysian Standard construction specifications introduced
- Malaysian Standard for construction specifications adopted by a minimum number of qualifying projects
- Compliance to Malaysian Standard for construction specifications considered by financial institutions for project financing purposes
- Online system for the certification of local products and imported products (U-Customs) to adopt national standards introduced
- 100 verification officers accredited as material standard assessors
- MyCESMM/MS CESMM mandated for all public civil engineering projects

### Key outcomes by 2020

- Key stakeholders: JKR, MOF, BEM, LAM, BQSM, and associations and SIRIM
- Scope of support:
  - Roll out public and private sector adoption of National Standard Specifications
  - Establish an online system for certification of local product
  - Comply with material standards and verification
  - Demonstrate MyCESMM/MS CESMM through public projects
- CIDB role:
  - Compile and consolidate various specifications used in the industry to develop construction specifications
  - Co-establish an online system for certification of local product
  - Formalise and implement inspection process for the verification of construction materials, and take immediate action in cases of non-compliance
  - Review and update MyCESMM/MS CESMM document to ensure alignment with international benchmarks and to ensure comprehensiveness of Bills of Quantities

### Highlighted roles of key stakeholders

- Not Exhaustive
**Case for change**

Limited access to enablers to support international expansion, including financing

- Lack of access to adequate financing for overseas projects
- Difficult for SMEs to obtain financing typically due to challenges in meeting loan risk assessment criteria

Limited number of Malaysian players participate in construction projects abroad

- Scale issues faced by Malaysian companies
- Limited knowledge, familiarity and market entry strategy in key target markets
- Gaps in internal capability-building, especially for SMEs

**Initiatives**

Strengthen access to financing for Malaysian champions going abroad

- Leverage working capital guarantee schemes to increase access to financing for SMEs
- Introduce special interest rates for overseas project financing for Malaysian champions
- Continue provision of feasibility study grants to improve chances of Malaysian players winning contracts abroad, especially in higher value-add projects

Support consortia formation and strengthen overseas market intelligence

- Promote consortia formation to gain scale and skills
  - Encourage bundling of construction projects in Malaysia
  - Encourage formation of consortia locally first, then participate in international tenders
- Develop targeted market entry strategy
  - Increase number of fact-finding missions in target markets
  - Drive synergies with MATRADE to increase presence overseas, especially in international conferences and competitions

**Key outcomes by 2020**

- Overseas project financing amount increased
- A minimum number of G8 companies introduced to loan interest rate cushion
- Feasibility grant disbursed

- Consortia with global partners formed and winning projects
- Value of projects won by Malaysian companies/consortia (domestically and abroad) increased
- Projects by Malaysian companies/consortia with global players won in the target markets

**Highlighted roles of key stakeholders**

- Key stakeholders: EXIM bank, MATRADE and MOF
- Scope of support:
  - Continual disbursement of feasibility study grants
  - Review possibility of tax deduction for feasibility studies and other financial products in construction
  - Disburse of loan interest rate cushion fund to eligible companies
- CIDB role:
  - Conduct a detailed assessment of financing gaps faced by large construction players and SMEs who export or have the potential to export
  - Promote funding support programmes to large players and SMEs

- Key stakeholders: EPU, EXIM Bank, MATRADE
- Scope of Support:
  - Encourage bundling of public projects to facilitate consortia formation,
  - Co-develop and maintain of “Going Global” directory to provide comprehensive information and guidelines for export of Malaysian construction services
  - Co-develop targeted internationalisation and market entry strategy, including enhancing market intelligence for target markets and evaluating opportunities relative to Malaysian capabilities
### Limited number of Malaysian players participate in construction projects abroad (cont’d)

- Different go-to-market methods recommended for different target markets
- Focus on infrastructure and commercial sectors given experience and expertise of Malaysian players

### Key outcomes by 2020

- CIDB role:
  - Define target construction sectors and type of consortia, key support provided, market awareness and promotion efforts
  - Develop criteria to assess credibility and quality of local players or members of consortia
  - Encourage bundling of public projects to facilitate consortia formation
  - Co-develop and maintain “Going Global” directory to provide comprehensive information and guidelines for export of Malaysian construction services
  - Emphasise co-developing a targeted internationalisation and market entry strategy, including enhancing market intelligence for target markets and evaluating opportunities against Malaysian capabilities
  - Facilitate project bidding and advise players vying for international projects and will encourage successful players to share experiences with smaller players venturing overseas

### Case for change

Not Exhaustive
Internationalisation is becoming an increasingly important avenue for Malaysian companies to capture growth beyond the domestic market. Malaysia’s Free Trade Agreements (FTAs) provide industries the opportunity to be part of a larger consumer market. Similarly, FTAs have also spurred foreign companies to increase their presence in Malaysia. This changing environment is affecting the Malaysian construction industry and it will need to be able to adapt and respond to the increased competition and scrutiny.
An effective governance structure that includes all relevant stakeholders is a critical foundation for the success of the CITP. A robust governance structure that will be able to effectively coordinate the implementation effort, as well as capture inputs from the various ministries and agencies, has been developed to oversee the successful implementation of the CITP (see Figure 50).

The governance structure comprises three layers. The CITP-Committee (CITP-C) will provide overall leadership. The CITP-C will be chaired by the Minister of Works and its members will consist of senior leadership members from key ministries and agencies. Next, Thrust-level working groups will be formed and will similarly comprise members from relevant ministries and agencies, key industry associations and players. In addition, multi-stakeholder Initiative-level working groups will also be formed. The Programme Management Office (PMO) will act as the Secretariat to the CITP-C to support the successful implementation of CITP.

The governance structure developed for the CITP offers sufficient leadership and focus and provides the necessary mechanisms to implement initiatives put forward by the CITP. CIDB is well-positioned to take the lead and act as a Secretariat in implementing the CITP as it plays an active role in coordinating and supporting the government's broader transformation efforts and especially in further developing the construction industry. Through this governance structure, the CITP will benefit from an effective and informed leadership that is able to support Malaysia's national ambitions, mechanisms to resolve issues in an efficient manner, and provide checks and balances to drive implementation outcomes as and when necessary.
Figure 50 CITP governance structure

CABINET

CITP – C
Chair: Minister of Works

Proposed key ministries and agencies

<table>
<thead>
<tr>
<th>Proposed key ministries and agencies</th>
<th>EPU</th>
<th>MOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPU</td>
<td>MOF</td>
<td>MITI</td>
</tr>
<tr>
<td>MOF</td>
<td>JKR</td>
<td>KPKT</td>
</tr>
<tr>
<td>JKR</td>
<td>KeTTHA</td>
<td>MOHR</td>
</tr>
<tr>
<td>KeTTHA</td>
<td>KDN</td>
<td>CIDB</td>
</tr>
</tbody>
</table>

Secretariat: CIDB

Quality, Safety, Professionalism
Chair and co-chair: TBD
Secretariat: CIDB
Relevant ministries and government agencies

Environmental Sustainability
Chair and co-chair: TBD
Secretariat: CIDB
Relevant ministries and government agencies

Productivity
Chair and co-chair: TBD
Secretariat: CIDB
Relevant ministries and government agencies

Internationalisation
Chair and co-chair: TBD
Secretariat: CIDB
Relevant ministries and government agencies

Direct interaction and engagement with industry
“We recognise that we are in a position to make a difference in supporting the nation’s housing and infrastructure needs through our solutions, tapping into our global network of expertise and experience. In line with our ambition to build better cities, we will continue to work closely with CIDB to contribute towards progressing the construction industry - in raising construction standards.”

Mr. Bradley Mulroney / Chief Executive Officer / Lafarge Malaysia Berhad

Robust governance

The CITP-C is to be chaired by the Minister of Works and will comprise members from relevant ministries and agencies. Ministries and agencies will be represented by their senior leadership members. The CITP-C will be accountable for the overall success of the CITP, and is set to meet every six months to steer the implementation of the programme forward. Additionally, the CITP-C will look to provide periodic progress updates to both the Cabinet and the Special Committee on the Services Sector.

Four Thrust Working Groups – one working group for each of the four CITP strategic Thrusts—will be established to support executive decision-making of the CITP-C. Members of the Thrust Working Groups will be senior working-level representatives from relevant stakeholders. It will support the CITP-C in implementing initiatives and in executing decisions made by the CITP-C. To allow for swift, effective and collaborative resolutions of issues raised, the Thrust Working Groups are to be chaired by industry leaders who are recognised for their excellence in the respective Thrusts, co-chaired by a senior member of a key ministry/agency central to the CITP.

Thrust Working Groups will convene quarterly. These meetings will be used as a forum to obtain implementation progress updates from Initiative Working Groups and to resolve any roadblocks in implementing initiatives. Thrust Working Groups will also be tasked to resolve conflicts raised by the Initiative Working Groups (to be set up for each of the CITP initiatives) and to guide implementation owners and their teams as they progress in carrying out the initiatives.

Input from Thrust Working Groups will be used to update the CITP-C on overall progress of the CITP, as well as to highlight potential roadblocks or delays in implementation. This will ensure that the CITP-C will be well-informed in its executive decision-making function.

In order to ensure strong industry alignment and support, it is essential that all stakeholders are bought-in, offer support and are actively involved in the initiatives proposed in the CITP. To that end, formal expressions of collaboration are being forged with multiple stakeholders through various avenues.

Each ministry or agency plays an important role in implementation, as they are tasked with important initiatives such as enhancing regulation, aligning funding, coordinating with state bodies and improving the procurement processes. All relevant ministries and agencies have indicated their commitment to deliver the CITP. For agencies within MOW (including JKR and the various professional boards) multilateral Pledges of Support have been signed.
Strong coordinating body

To support the delivery of the CITP, CIDB will enhance itself to reaffirm its position as a leading regulatory, development and industry-coordination body. CIDB has committed to adapt and improve its service delivery on its core functions of industry regulation, skills development and knowledge development. Buttressed by a robust and dedicated PMO that has been carved out to be a full-time, strong coordinating body for the CITP, CIDB will foster stronger collaboration with key stakeholders, including the ministries, agencies, professional boards, associations, academia and the private sector.

The PMO team has been tasked to drive the implementation of the CITP forward by monitoring, managing and reporting on the overall implementation of the CITP. The PMO will coordinate implementation activities of the CITP-C and the four Thrust-level Working Groups. The PMO will regularly communicate and liaise with the CITP leadership team and with key stakeholders.

The PMO’s scope of work, as Secretariat to the CITP governance structure, will include synthesising inputs from the various Thrust-level Working Groups and preparing for the semi-yearly CITP-C meetings. The PMO will also prepare quarterly updates and publish annual reports on the progress of the CITP.

The PMO will provide support in resolving issues and in coming up with solutions within the Thrust Working Groups. The PMO will work closely and look to actively engage initiative owners as thought-companions to support the implementation of the CITP.

Effective industry collaborations

Industry players play a critical role in driving the implementation of the CITP, as many activities within the CITP’s transformative initiatives are to be led and supported by industry players themselves. Many industry players are champions in their field, locally and even globally. Initiatives that can be supported by industry players range from partnering with the public sector for the co-development of a Specialist Apprenticeship Programme to developing a Malaysia-customised, holistic infrastructure rating tool.

The success of an initiative often relies on the expertise, experience and commitment of industry implementation partners. To-date, many of these industry leaders have not only reiterated their support and commitment to the CITP, but have also gone the extra mile of signing specific Pledges of Support for the CITP, stating their precise and substantive elements of support.

Given the critical role that industry players play, the CITP governance will therefore necessarily need to involve multiple industry stakeholders at all appropriate levels. Beyond participating actively in the Working Groups for the initiatives, industry players will be represented at the Thrust-level Working Groups. It is highly recommended that preeminent industry leaders be appointed as Chairpersons to the Thrust-level Working Groups. Within this capacity, these industry leaders can add immense value to the execution of matters and aid in clarifying and escalating critical issues.
MOVING FORWARD
Malaysia’s construction industry today still faces challenges. Productivity in the construction industry today is among the lowest across sectors, and far below that of global benchmarks. Much of the built environment today remains vulnerable to poor quality and environmental sustainability levels. Safety and professionalism in the industry remains low, while local players are losing market share domestically while not fully taking advantage of opportunities abroad. A full-scale transformation is thus warranted to make the leap from today to the envisioned target end-state: of an advanced, highly productive industry able to sustain continued growth and nurture international champions. This is the vision of the Construction Industry Transformation Programme (CITP).
To achieve truly transformative outcomes, initiatives will need to tackle issues in the construction industry holistically, including the economic, regulatory, operational, technological, human capital and innovation angles. Four strategic thrusts have been identified to focus CITP’s initiatives on in order to be all-encompassing of the critical issues: Quality, Safety and Professionalism, Environmental Sustainability, Productivity and Internationalisation. To this end, 18 strategic initiatives have been carefully designed and co-developed with relevant, capable and committed stakeholders to ensure practical yet transformative steps can be taken to deliver results. More than 150 stakeholders have been actively involved to-date across ministries, government agencies, industry players, professional boards and associations, suppliers, universities, training institutes and expert panels, a large portion of whom have pledged their explicit commitment to CITP and the precise ways on which they will work together to transform the industry.

In order to ensure execution success and realise CITP’s vision, the implementation of CITP needs to be a concerted effort, one that is masterfully orchestrated across the myriad key stakeholders of the construction industry. Given the many stakeholders, an effective and tie-breaking governance structure needs to be set-up, supported by a strong and effective coordinating body. The CITP Secretariat (the PMO), already established and fully functional, will monitor, track and report progress of the CITP’s four strategic thrusts and 18 initiatives as well as to facilitate the CITP-Committee and Thrust Working Groups meetings. The CITP-Committee will comprise the policymakers and be headed by the Minister of Works. Thrust Working Groups will be jointly comprised by key industry and senior government policymakers, chaired by an industry champion. There will be clear mechanisms to resolve issues at all levels, with recourse to raise any remaining unresolved issues up to the Cabinet if and when required. CITP’s robust governance structure is set up to enable a synergistic, cooperative and effective implementation.

The outcomes of CITP will be truly transformative by the end of the five year journey. CITP targets an industry culture that will be based upon the principles of quality, safety and professionalism. Malaysia’s sustainable infrastructure will be seen as a model for the emerging world. The construction industry will more than double its productivity, and match the increase in productivity with higher wages. Finally, Malaysian construction industry champions will lead the charge both locally and globally. All of this will be built on a bedrock of strong and effective multi-stakeholder collaborations. CITP will thus, focus on ‘Driving Construction Excellence Together’.
## Glossary

<table>
<thead>
<tr>
<th>ACRONYM</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAT</td>
<td>Australian Administrative Appeals Tribunal</td>
</tr>
<tr>
<td>ABM</td>
<td>Akademi Binaan Malaysia</td>
</tr>
<tr>
<td>AG</td>
<td>Auditor General</td>
</tr>
<tr>
<td>BAU</td>
<td>Business-as-usual</td>
</tr>
<tr>
<td>BCA</td>
<td>Building and Construction Authority, Singapore</td>
</tr>
<tr>
<td>BCBs</td>
<td>Building Control Bodies</td>
</tr>
<tr>
<td>BEC</td>
<td>Bumiputera Economic Community</td>
</tr>
<tr>
<td>BEM</td>
<td>Board of Engineers Malaysia</td>
</tr>
<tr>
<td>BIM</td>
<td>Building Information Modeling</td>
</tr>
<tr>
<td>BMI</td>
<td>Business Monitor International</td>
</tr>
<tr>
<td>BOMBA</td>
<td>Jabatan Bomba dan Penyelamat / Fire and Rescue Department of Malaysia</td>
</tr>
<tr>
<td>BOT</td>
<td>Build-Operate-Transfer</td>
</tr>
<tr>
<td>BQSM</td>
<td>Board of Quantity Surveyors Malaysia</td>
</tr>
<tr>
<td>BREEAM</td>
<td>Building Research Establishment Environmental Assessment Methodology</td>
</tr>
<tr>
<td>BS</td>
<td>British Standards</td>
</tr>
<tr>
<td>BSi</td>
<td>British Standards Institution</td>
</tr>
<tr>
<td>B-Score</td>
<td>Buildability Score</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer-aided Design</td>
</tr>
<tr>
<td>C&amp;D</td>
<td>Construction and demolition</td>
</tr>
<tr>
<td>CCC</td>
<td>Certificate of Compliance and Completion</td>
</tr>
<tr>
<td>CEEQUAL</td>
<td>Civil Engineering Environmental Quality Assessment and Award Scheme</td>
</tr>
<tr>
<td>CIAC</td>
<td>Construction Industry Advisory Committee</td>
</tr>
<tr>
<td>CIDB</td>
<td>Construction Industry Development Board</td>
</tr>
<tr>
<td>CITP</td>
<td>Construction Industry Transformation Programme</td>
</tr>
<tr>
<td>CITP-C</td>
<td>Construction Industry Transformation Programme Committee</td>
</tr>
<tr>
<td>CLQ</td>
<td>Central Labour Quarters</td>
</tr>
<tr>
<td>CMS</td>
<td>Competency Management System</td>
</tr>
<tr>
<td>COBie</td>
<td>Construction Operations Building Information Exchange</td>
</tr>
<tr>
<td>CoE</td>
<td>Centre of Excellence</td>
</tr>
<tr>
<td>CPC</td>
<td>Certificate of Practical Completion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACRONYM</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPSISC</td>
<td>Construction and Property Services Industry Skills Council</td>
</tr>
<tr>
<td>C-Score</td>
<td>Constructability Score</td>
</tr>
<tr>
<td>DBKL</td>
<td>Dewan Bandaraya Kuala Lumpur</td>
</tr>
<tr>
<td>DOSH</td>
<td>Department of Safety and Health, Malaysia</td>
</tr>
<tr>
<td>eMCRIS</td>
<td>Malaysia Constructed Integrated Solution</td>
</tr>
<tr>
<td>ESG</td>
<td>Environment, Social and Corporate Governance</td>
</tr>
<tr>
<td>ETP</td>
<td>Economic Transformation Programme</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>EPU</td>
<td>Economic Planning Unit</td>
</tr>
<tr>
<td>EXIM Bank</td>
<td>Export-Import Bank of Malaysia</td>
</tr>
<tr>
<td>FM</td>
<td>Facility Managers</td>
</tr>
<tr>
<td>FSA</td>
<td>Labuan Financial Services Authority</td>
</tr>
<tr>
<td>FTA</td>
<td>Free Trade Agreement</td>
</tr>
<tr>
<td>G2G</td>
<td>Government-to-Government</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GFA</td>
<td>Gross Floor Area</td>
</tr>
<tr>
<td>GGP</td>
<td>Government Green Procurement</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gases</td>
</tr>
<tr>
<td>GIS</td>
<td>Geographic Information System</td>
</tr>
<tr>
<td>GKV</td>
<td>Greater Klang Valley</td>
</tr>
<tr>
<td>GLCs</td>
<td>Government-linked Companies</td>
</tr>
<tr>
<td>GP</td>
<td>Government Procurement</td>
</tr>
<tr>
<td>GPE</td>
<td>Government Procurement Entity</td>
</tr>
<tr>
<td>GNI</td>
<td>Gross National Income</td>
</tr>
<tr>
<td>GSL</td>
<td>Government Soft Landings</td>
</tr>
<tr>
<td>GTOs</td>
<td>Group Training Organisations</td>
</tr>
<tr>
<td>HCDC</td>
<td>Human Capital Development Council</td>
</tr>
<tr>
<td>HEI</td>
<td>Higher Education Institution</td>
</tr>
<tr>
<td>IBS</td>
<td>Industrialised Building Systems</td>
</tr>
<tr>
<td>ICoSM</td>
<td>International Conference on Sustainable Materials</td>
</tr>
<tr>
<td>ICT</td>
<td>Information Communications and Technology</td>
</tr>
<tr>
<td>IHS</td>
<td>Information Handling Services</td>
</tr>
<tr>
<td>ACRONYM</td>
<td>DEFINITION</td>
</tr>
<tr>
<td>---------</td>
<td>------------</td>
</tr>
<tr>
<td>IJM</td>
<td>IGB Construction Sdn Bhd, Jurutama Sdn Bhd and Mudajaya Sdn Bhd</td>
</tr>
<tr>
<td>INSKEN</td>
<td>Institut Keusahawanan Negara</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organisation for Standardisation</td>
</tr>
<tr>
<td>ISZL</td>
<td>IJM-Sunway-Zelan-LFE Consortium</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>JKR</td>
<td>Public Works Department/Jabatan Kerja Raya</td>
</tr>
<tr>
<td>KeTTHA</td>
<td>Ministry of Energy, Green Technology and Water</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>KPKR</td>
<td>Ketua Pengarah Kerja Raya</td>
</tr>
<tr>
<td>KPKT</td>
<td>Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan</td>
</tr>
<tr>
<td>KS</td>
<td>Korean Industrial Standards</td>
</tr>
<tr>
<td>KVMRT</td>
<td>Klang Valley Mass Rapid Transit</td>
</tr>
<tr>
<td>LA</td>
<td>Local Authorities</td>
</tr>
<tr>
<td>LAM</td>
<td>Lembaga Arkitek Malaysia / Board of Architects Malaysia</td>
</tr>
<tr>
<td>LFE</td>
<td>LFE Engineering Sdn Bhd; formerly known as Loong Fuat Electrical Engineering Sdn Bhd</td>
</tr>
<tr>
<td>LNG</td>
<td>Liquefied Natural Gas</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>Mechanical and Electrical</td>
</tr>
<tr>
<td>MARA</td>
<td>Majlis Amanah Rakyat</td>
</tr>
<tr>
<td>MATRADE</td>
<td>Malaysia External Trade Development Corporation</td>
</tr>
<tr>
<td>MEB</td>
<td>Majlis Ekonomi Bumiputera / Bumiputera Economic Council</td>
</tr>
<tr>
<td>MNCs</td>
<td>Multi-national Companies</td>
</tr>
<tr>
<td>MOE</td>
<td>Ministry of Education</td>
</tr>
<tr>
<td>MOF</td>
<td>Ministry of Finance</td>
</tr>
<tr>
<td>MOHR</td>
<td>Ministry of Human Resources</td>
</tr>
<tr>
<td>MOU</td>
<td>Memorandum / Memoranda of Understanding</td>
</tr>
<tr>
<td>MOW/KKR</td>
<td>Ministry of Works / Kementerian Kerja Raya</td>
</tr>
<tr>
<td>MPC</td>
<td>Malaysia Productivity Corporation</td>
</tr>
<tr>
<td>MRT</td>
<td>Mass Rapid Transit</td>
</tr>
<tr>
<td>MTEM</td>
<td>Majlis Tindakan Ekonomi Melayu</td>
</tr>
<tr>
<td>MyCESMM</td>
<td>Malaysian Civil Engineering Standard Method of Measurement</td>
</tr>
<tr>
<td>N3C</td>
<td>National Construction Cost Centre</td>
</tr>
<tr>
<td>NCC</td>
<td>Nordic Construction Company</td>
</tr>
<tr>
<td>NCiIC</td>
<td>National Construction Industry Information Centre</td>
</tr>
<tr>
<td>NDPC</td>
<td>National Development Planning Committee</td>
</tr>
<tr>
<td>NEEAP</td>
<td>National Energy Efficiency Action Plan</td>
</tr>
<tr>
<td>NSGT</td>
<td>National Standards for Group Training</td>
</tr>
<tr>
<td>OHSAS</td>
<td>Occupational Health and Safety Assessment Specification</td>
</tr>
<tr>
<td>OSC</td>
<td>One-Stop-Centre</td>
</tr>
<tr>
<td>OSH</td>
<td>Occupational Safety and Health</td>
</tr>
<tr>
<td>PIPC</td>
<td>Pengerang Integrated Petroleum Complex</td>
</tr>
<tr>
<td>PMO</td>
<td>Programme Management Office</td>
</tr>
<tr>
<td>PR1MA</td>
<td>Perbadanan PR1MA Malaysia</td>
</tr>
<tr>
<td>QA/QC</td>
<td>Quality Assurance and Quality Control</td>
</tr>
<tr>
<td>QLASSIC</td>
<td>Quality Assessment System in Construction</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>RAPID</td>
<td>Refinery and Petrochemical Integrated Development</td>
</tr>
<tr>
<td>RDEs</td>
<td>Rapidly-developing Economies</td>
</tr>
<tr>
<td>RMK11</td>
<td>Eleventh Malaysia Plan</td>
</tr>
<tr>
<td>ROI</td>
<td>Return on Investment</td>
</tr>
<tr>
<td>SaaS</td>
<td>Software as a Service</td>
</tr>
<tr>
<td>SEC</td>
<td>Skills Evaluation Certificate Knowledge</td>
</tr>
<tr>
<td>SCORE</td>
<td>SME Competitive Rating for Enhancement / Program Penilaian Keupayaan dan Kemampuan Kontraktor</td>
</tr>
<tr>
<td>SCSS</td>
<td>Special Committee for the Services Sector</td>
</tr>
<tr>
<td>SHASSIC</td>
<td>Safety and Health Assessment System in Construction</td>
</tr>
<tr>
<td>SHO</td>
<td>Safety and Health Officers</td>
</tr>
<tr>
<td>SIRIM</td>
<td>Standards and Industrial Research Institute of Malaysia</td>
</tr>
<tr>
<td>ACRONYM</td>
<td>DEFINITION</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>SIRIM QAS</td>
<td>Standards and Industrial Research Institute of Malaysia Quality Assurance Services International Sdn Bhd</td>
</tr>
<tr>
<td>SJPP</td>
<td><em>Skim Jaminan Pembiayaan Perniagaan</em></td>
</tr>
<tr>
<td>SME</td>
<td>Small and Medium Enterprise</td>
</tr>
<tr>
<td>SME Corp</td>
<td>SME Corporation Malaysia</td>
</tr>
<tr>
<td>SOGP</td>
<td>Sabah Oil and Gas Terminal Project</td>
</tr>
<tr>
<td>SPA</td>
<td>Sales and Purchase Agreement</td>
</tr>
<tr>
<td>SPAN</td>
<td><em>Suruhanjaya Perkhidmatan Air Negara</em></td>
</tr>
<tr>
<td>SSS</td>
<td>Site Safety Supervisors</td>
</tr>
<tr>
<td>SW Corp</td>
<td>The Solid Waste Management and Public Cleansing Corporation</td>
</tr>
<tr>
<td>SWMP</td>
<td>Site Waste Management Plan</td>
</tr>
<tr>
<td>TERAJU</td>
<td><em>Unit Peneraju Agenda Bumiputera</em></td>
</tr>
<tr>
<td>TEVT</td>
<td>Technical education and vocational training</td>
</tr>
<tr>
<td>TPPA</td>
<td>Trans-Pacific Partnership Agreement</td>
</tr>
<tr>
<td>TNB</td>
<td>Tenaga Nasional Berhad</td>
</tr>
<tr>
<td>TOR</td>
<td>Terms of Reference</td>
</tr>
<tr>
<td>TRX</td>
<td>Tun Razak Exchange</td>
</tr>
<tr>
<td>UBBL</td>
<td>Uniform Building By-Laws</td>
</tr>
<tr>
<td>USM</td>
<td>Universiti Sains Malaysia</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compound</td>
</tr>
<tr>
<td>WRAP</td>
<td>Waste and Resource Action Programme</td>
</tr>
</tbody>
</table>
Acknowledgements

The formulation of the Construction Industry Transformation Programme benefitted substantially from the extensive deliberations, engagements and dialogues with the Government and industry stakeholders. The Ministry of Works and the Construction Industry Development Board would like to express its appreciation to the following individuals and organisations for their invaluable contribution in providing feedback and insight.

- The Right Honourable Tun Arifin bin Zakaria (Dato’ Lela Negara), Chief Justice of Malaysia, Chief Justice of Malaysia
- Tan Sri Dr. Ir. Ahmad Tajuddin Ali, Chairman, UEM Group Berhad
- Tan Sri Dr. Rebecca Fatima Sta Maria
- Dato’ Dzulkifli Mahmud, Chief Executive Officer, MATRADE
- Dato’ Hafsa Hashim, CEO, SME Corp.
- Dato’ Haji Mokhtar Samad, President, PKMM
- Dato’ Husni Salleh, CEO, TERAJU
- Dato’ Mohd Razali Hussain, Director General, MPC
- Dato’ Sr Abdull Manaf Bin Haji Hashim, President, BQSM
- Dato’ Sri Haji Fadillah Bin Haji Yusof
- Dato’ Sri Mustapa Bin Mohamed
- Dato’ Sri Prof. Ir. Dr. Judin Bin Abdul Karim
- Dato’ Srikandan, Managing Director, KPK Quantity Surveyors & Board Member, KPK Quantity Surveyors
- Mr Bradley Mulroney, Chief Executive Officer, Lafarge
- Mr Cheng Chee Chung, Managing Director, Panasonic
- Mr Dinesh Nambiar, Managing Director, Lend Lease Malaysia
- Mr Kwan Foh Kwai, Senior Managing Director, Construction Division, Sunway Construction
- Mr Liew Hau Seng, Managing Director, IJM Corporation
- Mr Ubull Din Om, Managing Director Engineering Division, GAMUDA Bhd
- Mr Patrick Thomas, Chief Executive Officer & Chairman of the Board, Bayer MaterialScience
- Professor Spiro N. Pollalis, Director of the Zofnass Program at Harvard for Infrastructure Sustainability, Professor of Design, Technology and Management, Harvard University
- Akademi Binaan Malaysia
- Association of Banks Malaysia (ABM)
- Association of Islamic Banking Institutions Malaysia (AIBIM)
- Association of Consulting Engineers Malaysia (ACEM)
- Bank Negara Malaysia (BNM)
- Bayer Material Science
- Bina Puri Holdings Berhad
- Board of Engineers Malaysia (BEM)
- Board of Quantity Surveyors Malaysia (BQSM)
- BURSA Malaysia
- Construction Industry Development Board (CIDB)
- Construction Industry Development Board (CIDB) Holdings
- Construction Research Institute of Malaysia (CREAM)
- Daelim Industrial
- Department of Occupational Safety and Health (DOSH)
- Dewan Bandaraya Kuala Lumpur (DBKL)
- Eastern Pretech
- Economic Planning Unit (EPU)
- Ekovest Berhad
- EMKAY Group
- Eversendai Corporation Berhad
- Export-Import Bank of Malaysia (EXIM)
- Federation of Sabah Industries (FSI)
- Gamuda Berhad
- Green Building Index (GBI)
- Harvard University
- IJM Corporation Berhad
- Implementation Coordination Unit (ICU)
- Institute for Sustainable Infrastructure (ISI)
- Institution of Engineers Malaysia (IEM)
- International Human Resources Development Corporation (IHRDC)
- International Islamic University Malaysia (IIUM)
- Immigration Department of Malaysia (Jabatan Imigresen Malaysia) (JIM)
- Jabatan Kerja Raya (JKR)
- Jabatan Pembangunan Sumber Manusia (JPSM)
- Jabatan Pengurusan Sisa Pepejal Negara (JPSPN)
- Jabatan Perhutanan Semenanjung Malaysia (JPSM)
- Kementerian Kerja Raya (KKR)
- Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan (KPKT)
- Kementerian Tenaga, Teknologi Hijau dan Air (KeTTHA)
- Ketua Setiausaha Negara (KSN)
- Khazanah Nasional Berhad
Acknowledgement

- KPK Quantity Surveyors Sdn Bhd
- Lafarge Malaysia Berhad
- Lembaga Arkitek Malaysia (LAM)
- Lembaga Hasil Dalam Negeri (LHDN)
- Lend Lease Group
- Majlis Amanah Rakyat (MARA)
- Malaysia External Trade Development Corporation (MATRADE)
- Malaysia Green Building Confederation (MGBC)
- Malaysia Productivity Corporation (MPC)
- Masers Energy
- Master Builders Association Malaysia (MBAM)
- Master Builders Australia (MBAM)
- Malayan Banking Berhad (Maybank)
- Ministry of Education (MOE)
- Ministry of Finance (MOF)
- Ministry of Foreign Affairs (MOFA)
- Ministry of Human Resource (MOHR)
- Ministry of Home Affairs (MOHA)
- Ministry of International Trade and Industry (MITI)
- Ministry of National Resources and Environment (NRE)
- Ministry of Works (MOW)
- MKH Berhad
- MMC Corporation Berhad
- MRT Corp
- National Development Planning Committee (JPPN)
- PanaHome Sdn Bhd
- Panasonic Malaysia Sdn Bhd
- Perbadanan Pengurusan Sisa Pepejal & Pembersihan Awam (PSPPA)
- Perbadanan PR1MA Malaysia
- Persatuan Kemajuan India Malaysia (PKIM)
- Persatuan Kontraktor Melayu Malaysia (PKMM)
- Pertubuhan Arkitek Malaysia (PAM)
- Perunding DMA Sdn. Bhd.
- Petronas Gas Berhad
- Professor Pollalis Inc
- Ranhill Energy and Resources Berhad (RBSB)
- Real Estate and Housing Developers’ Association Malaysia (REHDA)
- Royal Institution of Surveyors Malaysia (RISM)
- Sabah Urban Development Corporation (SUDC)
- Samsung Group
- Sarawak Housing and Real Estate Developers’ Association (SHEDA)
- Securities Commission (SC)
- Special Committee for the Services Sector (SCSS)
- SME Corp
- Sunway Group
- Tenaga Nasional Berhad (TNB)
- TERAJU
- The Royal Institution of Surveyors, Malaysia (RISM)
- TLC Architect
- UAC Berhad
- United Engineers Malaysia (UEM)
- Unit Perancangan Ekonomi Negeri (UPEN)
- Unit Peneraju Agenda Bumiputera (TERAJU)
- Universiti Putra Malaysia (UPM)
- Universiti Sains Malaysia (USM)
- Universiti Teknologi Malaysia (UTM)
- The World Bank
- Zofnass Programme, Harvard
Notes
Notes
For further information refer to:

Programme Management Office
Construction Industry Development Board (CIDB) Malaysia
Level 10, Menara Dato’ Onn
Pusat Dagangan Dunia Putra (PWTC)
No. 45, Jalan Tun Ismail
50480 Kuala Lumpur
MALAYSIA

E: pmo@cidb.gov.my
T: +603 4047 7216
F: +603 4047 7140