

SINGAPORE'S EFFORTS IN BUILDING CAPACITIES THROUGH CO-OPERATION

Koh Lin Ji and J.Subramaniam

Building and Construction Authority (BCA)
Singapore

Executive Summary

Singapore is a city with very few natural resources. Resources such as fuel and food have to be imported from around the world. With no natural hinterland, our homes, offices, factories, power stations, parks, roads, reservoirs, military facilities and many other uses have to be fitted within our small area of 700 square kilometres, whilst ensuring that our people still have a clean, green and comfortable environment to live in. With that in mind, Singapore also needs to ensure that its infrastructure meets the needs of its people and the export-oriented economy. With good governance, Singapore has formulated key policies and implemented them successfully throughout the public and private sectors.

Construction industry is one of the significant contributors to the economy. With major investments into sectors such as R&D, electronics, bio-engineering and petrochemicals, the need for infrastructure has grown tremendously. The Building and Construction Authority (BCA) of Singapore has worked closely with various ministries to ensure that the construction industry has the necessary capabilities to function effectively and efficiently. Moreover, it has shared capability building and skills training programmes with various government agencies including China, Cambodia, Malaysia, South Africa and the United Arab Emirates to improve the respective country's construction industry. BCA has also tied-up with the United Nations Environment Programme to establish a Centre on Sustainable Buildings in South-East Asia to promote and elevate sustainable solutions in the building sector.

BCA has expanded its outreach to the region and beyond by working with organisations or associations and governments to build capabilities and capacities. This allows Singapore to share its expertise with the region and contribute a consolidated effort to improve construction industries.

Introduction

The Building and Construction Authority (BCA) is an agency under the Ministry of National Development, championing the development of an excellent built environment for Singapore. "Built environment" refers to buildings, structures and infrastructure in our surroundings that provide the setting for the community's activities.

Our mission is "we shape a safe, high quality, sustainable and friendly built environment". Safety, Quality, Sustainability and User-Friendliness are four key areas where BCA has a very significant influence on the built environment and they distinguish Singapore's built environment from those of other cities. Hence, our vision is to have "the best built environment for Singapore, our distinctive global city".

Building Safety

The prime objective of building control is to ensure building works comply with standards of safety, amenity and matters of public policy as prescribed in the Building Control Act & Building Control Regulations. All building works, except those that are minor and exempted under the Schedule in the Building Control Act, will require building plan approval from the Commissioner of Building Control, BCA.

Quality

Quality workmanship is important in today's construction industry. The high quality achieved in building projects ensures future marketability and enhances the confidence of clients. The Construction Quality Assessment System (CONQUAS®), introduced in Singapore since 1989, serves as a standard assessment system on the quality of building projects. A de-facto national yardstick for the industry, CONQUAS® has been periodically fine-tuned to keep pace with changes in technology and quality demands of a more sophisticated population. In 1998, BCA introduced a number of new features to CONQUAS® resulting in the launch of CONQUAS® 21. Such refinements make CONQUAS® scoring more comprehensive and customer oriented.

By using CONQUAS® as a standardized method of quality assessment, developers are able to use the CONQUAS® score to set targets for contractors to achieve and also assess the quality of the finished building.

Today, CONQUAS® is widely recognised and also accepted internationally as a benchmarking tool for quality. Indeed, countries like Malaysia and Hong Kong have successfully adapted CONQUAS® to their construction industries. CONQUAS® is now a registered trademark in Singapore, Malaysia, China, Hong Kong SAR, United Kingdom, Australia, South Africa and India.

Sustainability

The BCA Green Mark Scheme was launched in January 2005 as an initiative to drive Singapore's construction industry towards more environment-friendly buildings. It is intended to promote sustainability in the built environment and raise environmental awareness among developers, designers and builders when they start project conceptualisation and design, as well as during construction. BCA Green Mark provides a meaningful differentiation of buildings in the real estate market. It is a benchmarking scheme which incorporates internationally recognized best practices in environmental design and performance. This can have positive effect on corporate image, leasing and resale value of buildings.

The 1st Green Building Masterplan was launched in 2006 to encourage, enable and engage industry stakeholders to step up efforts in environmental sustainability. With the Inter-Ministerial Committee on Sustainable Development (IMCSD) setting the target to green 80% of our buildings by 2030, BCA released the 2nd Green Building Masterplan, which has a total of six strategic thrusts targeted at three development areas: new buildings, existing buildings and beyond buildings. With the 2nd Green Building Masterplan, BCA will continue to champion a proactive and holistic approach to tackling challenges such as greening of our existing building stock and the building of industry capabilities, in order to realise our vision of the best built environment for Singapore, a distinctive global city.

Universal Design

Universal Design (UD), in the broadest term, is “design for all people”. It seeks to create an environment addressing the needs for all age groups and people of different abilities including temporary disability. The move towards universal design has developed due to the expanding population of people with varying degree of abilities and advancing years, their demands for recognition and desire for independent living.

In Singapore, the relevant authorities are also targeting at more innovative and friendly design to improve usability and liveability for everyone. It is the intention of BCA to instil awareness among designers and building owners/developers who have the influence to cater for the full range of human needs and be sensitive to incorporate them in the design.

To address these needs, BCA introduced a new Universal Design Guide in October 2007 that provides a more complete set of guidelines for adoption in all building designs. It has UD recommendations that are applicable not only to commercial buildings but also a wider range of building types, including residential buildings as well as public and community facilities.

Transforming Industry

a) Overseas Testing Centres (OTCs)

Since 1995, BCA has been meeting the construction industry's needs for skilled manpower by working with Singapore's and host countries' contractors to set up Overseas Testing Centres (OTCs) in the approved host countries, namely India, China, Myanmar, Thailand and Bangladesh. Workers can choose any of the 27 different trades to undergo training and subsequent testing in these OTCs to be certified as trained construction workers for the Singapore market. All foreign construction workers need to pass a BCA trade test and be awarded with the skills certificate before they can enter and be employed in the construction industry. The tests have both written and practical components and workers must pass both to ensure that they possess good basic construction capabilities. BCA continues to work closely with these OTCs to ensure that the skills training are at the highest level.

b) Industry Development

i. Precast Technology

To increase the productivity of the industry, BCA encouraged the industry to adopt precast or prefabrication technology to ensure both high quality and increased productivity is achieved for projects. It has since introduced adequate funds for local firms interested to set up as prefabricators.

ii. Contractor Registry System

The Contractors Registry is administered by BCA to serve the procurement needs of government departments, statutory bodies and other public sector organizations. Except for Regulatory Workheads (RW), the Registry functions as an administrative body only for the public sector procurement. As such, contractors which are not registered with BCA are not precluded from conducting business as contractors or suppliers outside the public sector.

iii. Productivity

BCA has introduced a S\$250-million Construction Productivity and Capability Fund as part of the Government's efforts to help the construction industry improve productivity and strengthen its capability. The Fund comprises incentive schemes that focus on workforce development, technology adoption and capability development in Singapore's built environment:

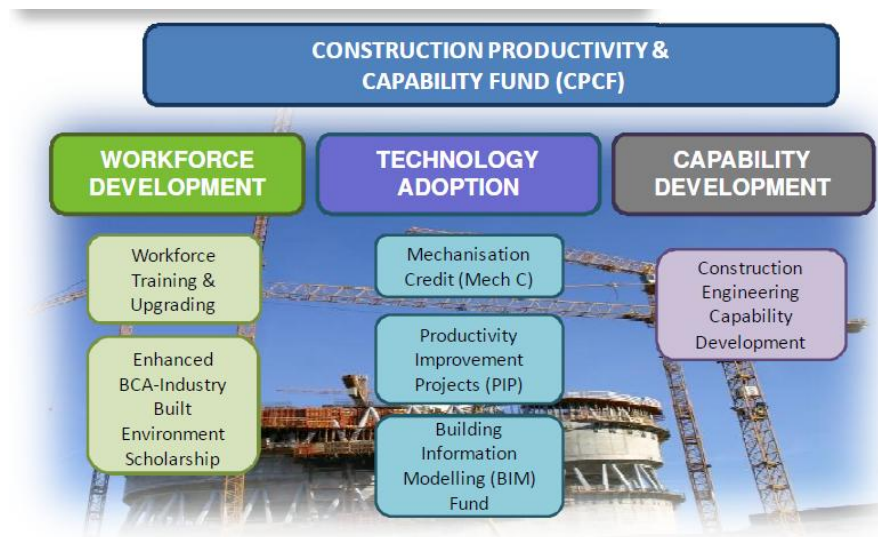


Figure 1: Construction Productivity & Capability Fund (Source: BCA website.

<http://www.bca.gov.sg/>)

International Development

The International Development Division (IDD) was set up in 2003 to actively promote and support our local construction, construction related, and property and real estate companies to venture overseas. In addition, IDD promotes Singapore as a hub for green technologies, facilitates networking with Government officials, the industry and facilitates formation of consortia/strategic alliances for projects. IDD is active in China, India, Indonesia, Middle East and Vietnam since 2003.

Research

a) Zero Energy Building (ZEB)

With the Inter-Ministerial Committee on Sustainable Development (IMCSD) setting a target for the building industry, which is to achieve 80% Green Mark Certification for all buildings by the year 2030, many existing buildings will have to be greened.

To serve as a test bed for integration of Green Building Technologies (GBT) in existing buildings and to be a hub for practitioners and students in the study of energy efficiency and green buildings, the Zero Energy Building (ZEB) was conceived as a collaborative effort among BCA, the National University of Singapore (NUS), the Solar Energy Research Institute of Singapore (SERIS) and partners from the private sector. Located within the BCA Academy, ZEB is retrofitted from an existing building, the first to be achieved in Singapore and Southeast Asia. The technology that are being test bedded in ZEB at the moment will have potential applications for many of the existing buildings that will be striving to achieve Green Mark Certification in the not too distant future. Zero Energy also refers to energy self sufficiency without the need to tap on power supply from the grid at all. For energy scarce Singapore which is also devoid of natural resources, the success of ZEB in achieving this target is exciting and has tremendous implications on the way energy is used in Singapore for specific types of buildings.

b) BCA Centre on Sustainable Buildings

BCA and the United Nations Environment Programme (UNEP) signed an agreement to collaborate on promoting and establishing sustainable building policies and practices in the Southeast Asia region. On 14 September, at the International Green Building Conference 2011 held during Singapore Green Building Week, a Memorandum of Understanding (MOU) was signed, formalizing cooperation between BCA and UNEP to provide policy advice and outreach activities related to sustainable resource management in the building sector.

The agreement between UNEP and BCA formally established the BCA Centre for Sustainable Buildings as a "Centre Collaborating with UNEP" to assist in developing tools, approaches and support to countries in the region in a coordinated effort to elevate sustainable solutions in the building sector. Through identification of successful policies, strategies and technologies at the regional and national levels, BCA will support the propagation of sustainability in the building sector in Southeast Asia.

BCA is currently producing a series of 'State of Play' reports for eight Southeast Asia countries to contribute to UNEP-SBCI's growing publications assessing policies and practices in sustainable building. The formal collaboration will expand these joint activities to include workshops, training, outreach, fundraising, and potentially the implementation of international projects in the region, broadening the reach and distribution of UNEP's work on sustainable buildings and cities. In addition to the country reports currently being produced by BCA for UNEP-SBCI, the groups will develop a joint work plan to guide the collaboration over the coming years.

International Collaborations

a) Capacity Building

BCA has provided assistance to the Malaysian, South African and Abu Dhabi governments to set-up their Building Control and Management Systems and Industry Development programmes. It has provided valuable advice and help through sharing sessions conducted in Singapore and/or the recipient countries so that their government officials have the necessary knowledge and tools to manage their construction industry.

Singapore and Cambodia launched its first multi-agency training programme in Land Management, Urban Planning and Building Control for the Cambodian Ministry of Land Management, Urban Planning and Construction to train 1,140 Cambodian government officials in urban planning and development. The objectives of the capacity building programme are to accelerate the building of capability to support administrative functions at the federal as well as provincial levels; and to embark on the national development and law formulation initiatives to strengthen and enhance its foundation systems for land and urban management, and building control. The participants were also introduced to Singapore's land management, building codes and regulations.

b) Sustainability

Training programmes on Green Building Technologies for Professionals and Managers for the Sino-Singapore Tianjin Eco-City were jointly organised by the Tianjin Institute of Urban Construction, China (TIUC) and BCA Academy (BCAA) to help the practitioners/officials working in the Tianjin eco-city to understand the Green Building Evaluation Standards (GBES) and its requirements, as well as to better understand green building technologies

and management to administer the Green Building Standards more effectively. The training programme provided insights to international development of green buildings; and benchmarking, comparisons, best practices and case studies applicable to the Tianjin Eco-City.

The BCA Academy of the built Environment organised a training programme for Zhejiang officials on planning and development of a sustainable built environment. The objective of the programme was to share with participants an overview of Singapore's efforts to plan and development a sustainable built environment in Singapore. This programme provided an insight into the processes involved in developing a green city.

BCA has signed the several Memoranda of Understanding (MOU) with various municipal government agencies and organisations in China to collaborate on building capacity for green buildings and sustainable developments. These collaborations include drafting of green building and district standards, training and exchanges, and collaborative showcase green building projects.

Conclusion

BCA has worked closely with various government agencies and private organisations to build its capacity and also contribute to capacity building efforts locally and to the region. And it has established itself as a key regional player for sustainable buildings solutions.

Capacity building programmes to various foreign delegations have provided us valuable experiences. Government officials from these countries have learnt about Singapore's governance, framework and processes for construction industry.

These programmes and initiatives provided an avenue for BCA to showcase to the region and the international fraternity its construction capabilities. Overall, BCA has helped built capacity and sustainability within its shores and regionally.

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