1.0 Singapore's Construction Industry

1.1 Industry Overview

Singapore's construction industry is one of the major contributors in Singapore's GDP, and in 2018, the construction industry contributed 516.3 billion SGD towards the nation's GDP, which amounts to around 3.5 percent. Despite a slower growth in recent years, the construction industry remains one of the most important roles in Singapore's economy. The industry provides the infrastructure that is necessary for Singapore to improve its socio-economic development and yet simultaneously contribute financially in the nation's growth.

With a population size of 5.612 million and a land area of 724 km², the overall construction demand ranges between around S$27 billion and 39 billion in the past 10 years. This is comprised of public and private sector, with public sector often used to moderate construction volume of work.

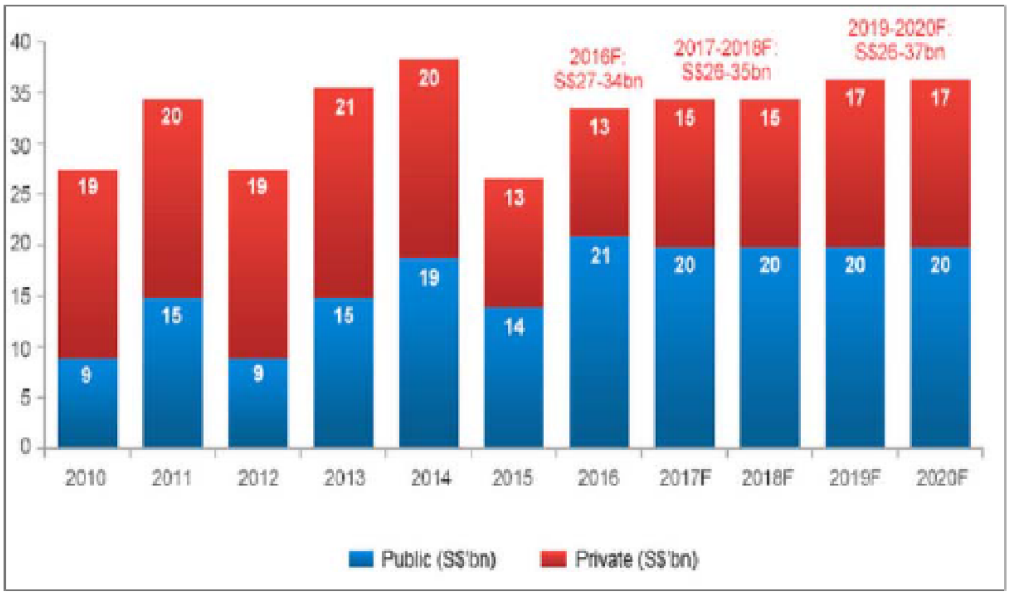
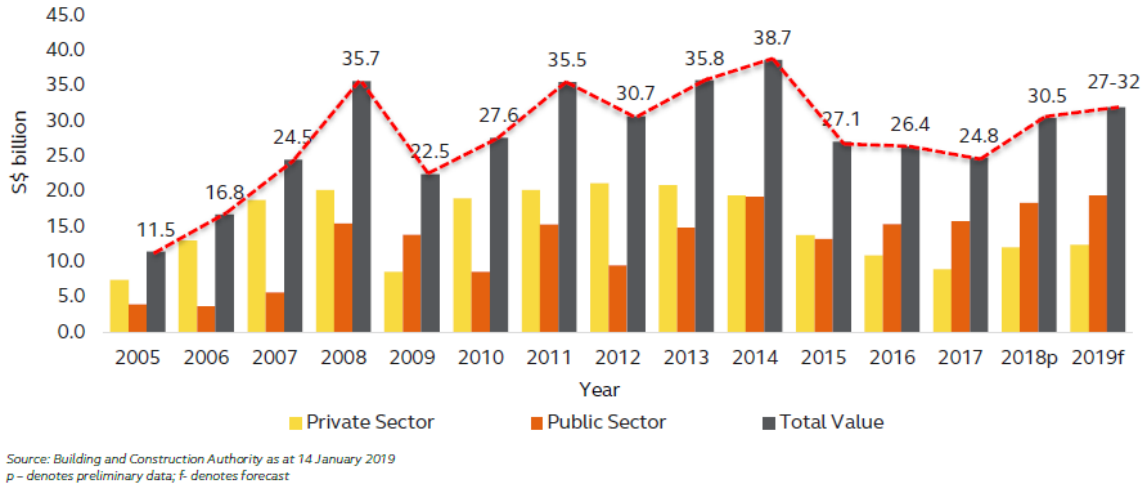


Figure 1: Construction Demand in Singapore

In recent years, the construction demand has been declining due to slow economic growth and the managed residential property market. In 2017, there were S$1.4 billion worth of public projects that has been tendered out to boost the construction sector. The various government agencies were also encouraged to carry out infrastructure projects to create more opportunities for the local SMEs (Small and Medium-sized Enterprises) firms. The efforts initiated by the Government to increase the number of high-value public sector projects and coupled with private residential and industrial developments pushed the increase in construction demand in 2018.

In 2018, the total construction demand amounted to S$30.5 billion, which the industry saw an increase of 23 percent as compared to 2017. Drivers such as growth in institutional and civil engineering works contributed to the increase in demand for public sector projects. For private sector projects, the demand was driven by the increase of redevelopment of various en-bloc transactions and the growth in industrial developments.



Source: Building and Construction Authority as at 14 January 2019
p – denotes preliminary data; F- denotes forecast

Figure 2: Comparison between construction demands in Public and Private Sector

1.2 Sustainability

As Singapore aspires to be a leading global city in environmental sustainability, there is scope to further improve the role of the QS in procuring and understanding energy efficiency requirements in buildings, to address the impact of climate change. While the focus on energy efficiency remains important, the QS must also take a more holistic approach to encourage environmental friendliness in buildings to ensure that environmental quality and comfort are not compromised. Among other existing Green Mark initiatives, BCA has enhanced sustainability to include the following new areas which the QS must make an effort to include in their cost studies, evaluations, pre and post contracts.

1. <u>BCA-HPB Green Mark for Healthier Workplaces</u>

The health and well-being of building occupants is increasingly becoming a major value proposition for the adoption of green buildings and interior spaces. This awareness is echoed by business leaders and companies that place growing emphasis on employee health and well-being to differentiate themselves as the employer of choice. In line with global trend and increasing demand for green and healthy buildings, the BCA Green Mark has been placing greater emphasis on the quality of indoor environments as well as the health, comfort and well-being of the users and occupants. To strengthen the business case for energy-efficient, resource efficient and healthier interior spaces, BCA collaborated with Health Promotion Board (HPB) to develop the new BCA-HPB Green Mark for Healthier Workplaces scheme (GM HW: 2018).

With international studies indicating that 90% of the business operating costs are related to human capital costs, staffs productivity would be of paramount interest and concern to any company. The new GM HW would appeal to companies that place emphasis on both health and well-being in addition to environmental sustainability in the fitting-out of their office. GM HW aims to provide a clearer and stronger business case for office sustainability by placing occupants health, well-being and comfort at the forefront of office design and daily operations during the procurement and contracting process. It also seeks to create a supportive environment through the establishment of workplace health structures, policies and programmes. With the inclusion of criteria that also looks at the health and well-being, this will make the value proposition for green interior more compelling and personal from the users angle.

2. Route to Digitalisation

In Singapore's sustainable construction industry, there has been a strong focus on digitalising the industry since eight years ago, and had evolved from advocating the use of Building Information Modelling (BIM) to Virtual Design and Construction (VDC), which has subsequently become Integrated Digital Delivery (IDD). In addition to driving the push for Integrated Digital Delivery in projects, the Government launched the Construction Industry Transformation Map (CITM) and initiated funding schemes to help transform the industry from a labour-intensive workforce into a productive skilled workforce proficient in digital tools and applications. The Government also aims to transform the sector to adopt building methods that are smart, efficient and green, and to utilise technology, innovation and digitalisation.

One of the initiatives implemented would be Design for Manufacturing and Assembly (DfMA). There has been an increase in the adoption rate from 10 percent in 2016 to 19.2 percent in 2017, based on the Government's aim to increase this to 20 percent by 2020.

3. Productivity Increase

Since 2010, construction on-site productivity has increased by a compound annual growth rate of 1.3 percent per year, with the government's constant push for a higher productivity rate. In order to increase the productivity rate, many initiatives and policies were launched. In 2010, the Construction Productivity Roadmap was launched. Since 2011, it was mandatory that the construction firms to submit construction productivity data to BCA and track whether their construction methodology is as productive as the benchmarks set by the government. The following tables show the various productivity indicators by BCA:

Year	Industry Overall Productivity Indicator
2010	0.381
2011	0.384
2012	0.389
2013	0.395
2014	0.403
2015	0.411
2016	0.419
2017	0.428
2018	0.438

Figure 3: Industry Overall Productivity Indicator (m^2 per man day)

Year	PublicHousing (HDB Projects)	Residential (landed)	Residential (non-landed)	Commercial	Industrial	Institutional
2010	0.439	0.190	0.319	0.328	0.495	0.319
2011	0.441	0.192	0.321	0.330	0.501	0.330
2012	0.449	0.194	0.326	0.335	0.508	0.338
2013	0.459	0.196	0.331	0.341	0.513	0.348
2014	0.470	0.199	0.337	0.348	0.523	0.355
2015	0.482	0.202	0.343	0.355	0.534	0.363
2016	0.493	0.204	0.349	0.363	0.542	0.373
2017	0.504	0.206	0.357	0.370	0.554	0.381
2018	0.517	0.210	0.366	0.378	0.566	0.391

Figure 4: Project Productivity by Building Category (m^2 per man day)

Digitalising the industry also helps with the productivity rate in industry, as the approaches such as DfMA will help to simplify the various construction methods through automation and the introduction of principles for manufacturing processes. Various government assistance schemes for local construction firms, such as the Construction Productivity Capabilities Fund (CPCF), of S$800 million, for Small and Medium Enterprises to improve their workforce development, technology adoption and capability development.

4. Reduce Manpower

Manpower, being one of the most important resources in Singapore's construction industry, is essential to be integrated with productivity implementation, with investments in human resource practices that will allow continuous growth in the employees (Joy Ong, 2019). Foreign workforce in Singapore was always seen as the main source of the industry's poor productivity levels, which has led to various manpower policies by the Ministry of Manpower to reduce reliance on foreign workforce and be replaced by technology. Such policies include Man-Year Entitlement (MYE) and Foreign Worker Levy (FWL). To reduce this manpower reliance, BCA also increased the minimum standards for Buildable Design Score and Constructability Score further in 2013.