

Hong Kong Civil Engineering and Electrical Construction Works Market Study

Prepared for

Wing Lee Group (Holdings) Limited

Date : _____

For and on behalf of
Frost & Sullivan Limited



Name: Terry Tse

Title: Consulting Director

Highly Confidential
Sep 2024



FROST & SULLIVAN

沙利文 60周年
60th ANNIVERSARY

© 2024 Frost & Sullivan. All rights reserved. This document contains highly confidential information and is the sole property of Frost & Sullivan. No part of it may be circulated, quoted, copied or otherwise reproduced without the written approval of Frost & Sullivan.

Agenda

- 1** Introduction of the Research
- 2** Overview of Macro Economy in Hong Kong
- 3** Overview of Hong Kong Civil Engineering Market
- 4** Overview of Hong Kong Electrical Construction Works Market
- 5** Competitive Landscape of Hong Kong Civil Engineering Market
- 5** Competitive Landscape of Hong Kong Electrical Construction Works Market

Abbreviations and Terms

- **CAGR:** compound annual growth rate
- **Mainland China / the PRC:** the People's Republic of China
- **GDP:** gross domestic product
- **HKD/ HK\$:** Hong Kong Dollar, the lawful currency in Hong Kong

Scope

- The project scope is defined as follows:

Research Period	<ul style="list-style-type: none">• Historical Year: 2018-2023• Base Year: 2023• Forecast Year: 2024E-2028E
Geographic Scope	<ul style="list-style-type: none">• Hong Kong
Industry Scope	<ul style="list-style-type: none">• Civil Engineering• Electric Construction Works

Limitations

■ Source of Information

- Interviews with industry experts and competitors will be conducted on a best-effort basis to collect information in aiding in-depth analysis for this report.
- Frost & Sullivan will not be responsible for any information gaps in the circumstances that interviewees refused to disclose confidential data or figures.
- The point of this study is set in 2024. It took 2023 as the base year and 2024-2028 as the forecast period. However, in the case where data has not yet been updated or published on public sources at the point of this study, Frost & Sullivan would use the latest data available or make preliminary projections based on historical trends.



- Under circumstances where information was not available, Frost & Sullivan would use in-house modelling and simulation to arrive at an estimate.

- Sources of information are stated at the bottom on each page for reference.

Agenda

- 1 Introduction of the Research
- 2 Overview of Macro Economy in Hong Kong
- 3 Overview of Hong Kong Civil Engineering Market
- 4 Overview of Hong Kong Electrical Construction Works Market
- 5 Competitive Landscape of Hong Kong Civil Engineering Market
- 5 Competitive Landscape of Hong Kong Electrical Construction Works Market

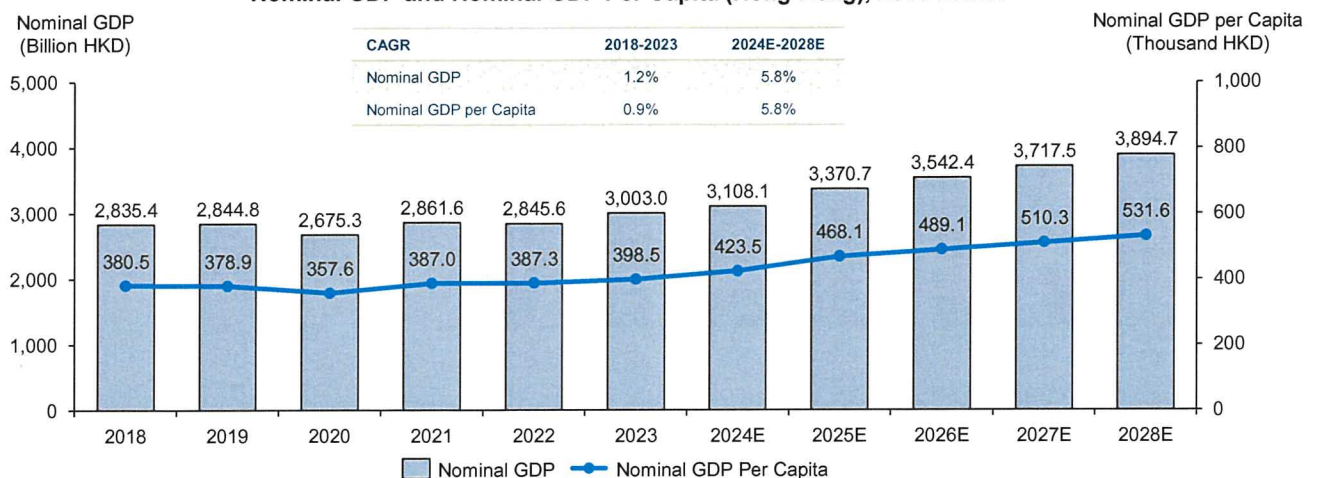
Overview of Macro Economy in Hong Kong

Nominal GDP and GDP Per Capita

■ Nominal GDP and GDP per capita in Hong Kong has shown slight growth during 2018 to 2023

- Attributed to the increase in domestic demand and trade performance featured with recovery of economy in Europe and North America, the nominal GDP in Hong Kong has registered steady growth, from HK\$2,835.4 billion in 2018 to HK\$3,003.0 billion in 2023. Owing to the outbreak and resurgence of COVID-19 in 2020 and 2022, the Nominal GDP plunged from HK\$2,844.8 billion in 2019 to HK\$2,675.3 billion in 2020, representing a CAGR of approximately 1.2% was recorded from 2018 to 2023.
- Moving forward, according to International Monetary Fund ("IMF"), Hong Kong's economy is set to regain its momentum along with the recovery of tourism and consumption, the nominal GDP of Hong Kong is expected to recover and grow from HK\$3,108.1 billion in 2024 to HK\$3,894.7 billion in 2028, representing a CAGR of approximately 5.8%.
- In line with the growth of nominal GDP, the nominal GDP per capita in Hong Kong has increased at a CAGR of 0.9% from 2018 to 2023, and is expected to increase at a CAGR of 5.8% during 2024 to 2028 according to the IMF.

Nominal GDP and Nominal GDP Per Capita (Hong Kong), 2018-2028E

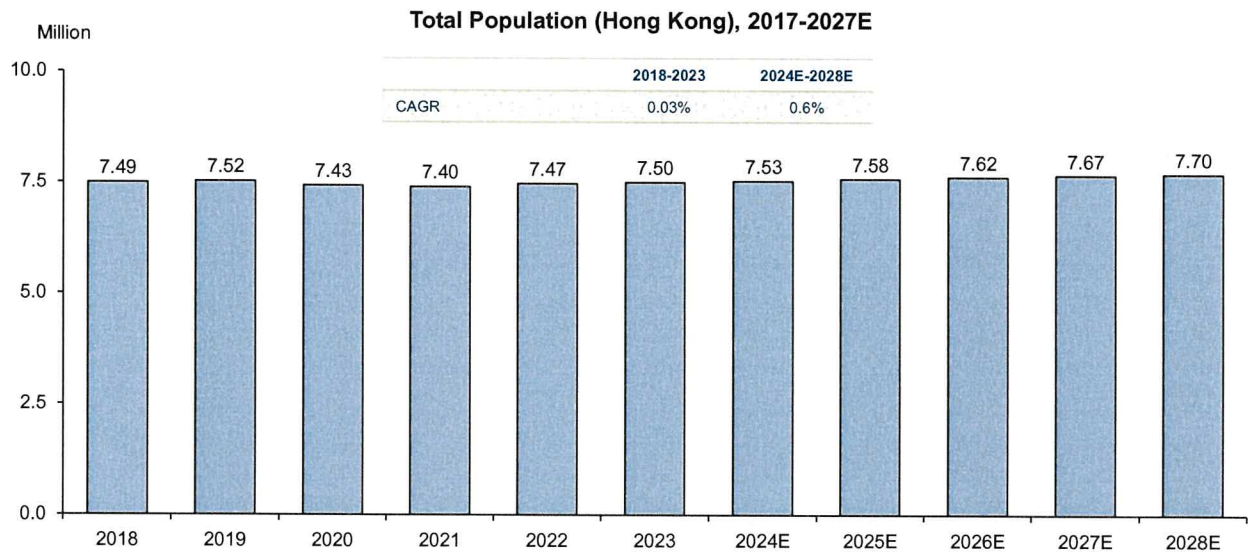


Source: Census and Statistics Department of Hong Kong, International Monetary Fund, Frost & Sullivan

Overview of Macro Economy in Hong Kong

Total Population

- The population in Hong Kong has slightly increased from 7.49 million in 2018 to 7.50 million in 2023, with a CAGR of 0.03%. It is mainly associated with (i) a natural decrease (i.e. deaths surpassing births) and (ii) net outflow of Hong Kong residents.
- With (i) the proactive approach in attracting more outside talent to settle in Hong Kong and (ii) fostering a supportive environment for raising families, the population growth is mild and is expected to maintain a CAGR of 0.6% from 2024 to 2028.



Source: Census and Statistics Department of Hong Kong, International Monetary Fund, Frost & Sullivan

F R O S T & S U L L I V A N

8

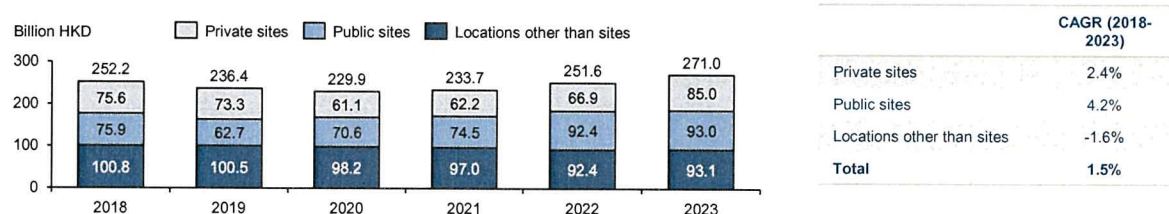
Overview of Macro Economy in Hong Kong

Gross Value of Construction Work Performed

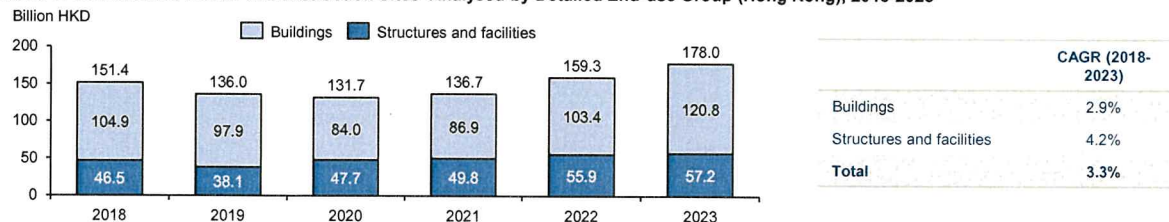
■ Gross value of construction works performed in Hong Kong increased during recent years.

- According to Census and Statistics Department of Hong Kong, the gross value of construction works performed in Hong Kong by broad trade group has slightly increased from approximately HKD252.2 billion in 2018 to approximately HKD271.0 billion in 2023, representing a CAGR of 1.5%. However, a recession during 2019 and 2020 with the social unrest and COVID-19 pandemic has occurred that led to (i) the suspension of construction work; (2) worldwide lockdowns, thus affecting the supply of raw materials, resulting in delay to progress of the ongoing projects and commencement of new projects in Hong Kong. Nevertheless, the Hong Kong government is keen to promote economic growth through infrastructural development, namely Kwun Tung North (KTN) and Fanling North (FLN) New Development Area (NDA) development, Kau Yi Chau Artificial Island under the Lantau Tomorrow Vision, which will foster the construction industry development in the future.

Gross Value of Construction Works Performed by Broad Trade Group (Hong Kong), 2018-2023



Gross Value of Construction Works at Construction Sites Analysed by Detailed End-use Group (Hong Kong), 2018-2023



Note:

- Gross value of construction works in nominal terms.
- Construction works at locations other than sites include both non general trades and special trades that are performed on non-construction sites. General trades include decoration, repair and maintenance, and construction works at minor works locations such as site investigation, demolition, and structural alteration and addition works. Special trades include carpentry, electrical equipment, ventilation, gas and water fitting installation and maintenance etc.
- Construction works of structure & facilities refer to the construction works that are performed at transport, other utilities & plant, environment and sports & recreation.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

9

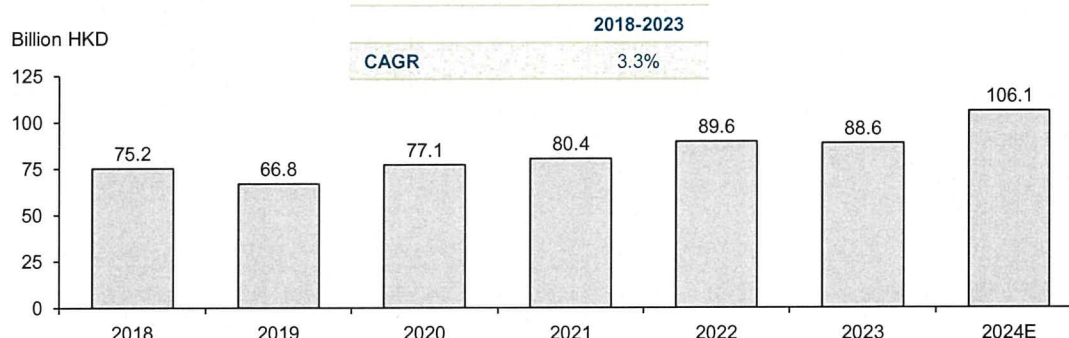
Overview of Macro Economy in Hong Kong

Government Expenditure on Infrastructure

■ Expenditure and funding on infrastructure rising steadily during 2018 to 2023.

➤ By 2023, the government's expenditure on infrastructure had increased to HK\$88.6 billion, representing a positive growth trend in investment. The upward trajectory in spending demonstrates the government's commitment to enhancing the region's infrastructure and addressing the evolving needs of the population. It is important to note that the COVID-19 pandemic, which emerged in 2020, had an impact on economic activities and supply chains in the region. However, despite these challenges, the government remained focused on infrastructure development and continued to allocate substantial funds to such projects such as the Northern Metropolis Development, Hung Shui Kiu/ Ha Tsuen New Development Area, Hong Kong-Shenzhen Innovation and Technology Park, Tung Chung Line Extension, site formation and infrastructure works for public housing development in Wang Chau etc. outlined in the Policy Address 2023 and the 2024/2025 Budget. Looking ahead, the government's commitment to infrastructure investment is expected to persist. Annual capital works expenditure is anticipated to rise, with an expenditure of HKD106.1 billion to be recorded in 2024 according to the Government Budget.

Government Budget – Expenditure on Infrastructure (Hong Kong), 2018-2023



Note:

1. Year indicates the respective fiscal year of Hong Kong government, e.g. 2023 refers to the fiscal year of 2017/2018. i.e. April 2023 to March 2024.
2. The 2024 figure is estimated by the Hong Kong Government Budget

Source: Hong Kong Government Budget, Census and Statistics Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

10

Overview of Macro Economy in Hong Kong

Capital Projects under Construction and Planning in Hong Kong

➤ According to the Civil Engineering and Development Department (CEDD) of Hong Kong, there are approximately 25 projects under planning and 55 projects under construction, as of April 2024. The below table sets forth the major construction projects in Hong Kong.

Projects	Period	Description
Infrastructure works for developments at Kwun Tong Action Area	NA	The project involves road modification and junction improvement, modification of an existing public transport interchange; and etc
Lantau Tomorrow Vision	NA	Currently the undergoing include planning and engineering study on the Lantau Tomorrow Vision and a technical feasibility study on the strategic road and rail connecting the artificial islands.
Hung Shui Kiu/Ha Tsuen New Development Area	2020-2034	Site clearance and formation engineering infrastructure works including a primary distributor road, district distributor roads, local roads, sewerage (including pumping stations), drainage, water supply, landscaping, electrical and mechanical ("E&M") and associated works
Kwu Tung North and Fanling North New Development Area	2019-2031	Site formation and engineering infrastructure works including Fanling Bypass (Western Section), Po Shek Wu Road Flyover, new interchanges together with widening of Fanling Highway for connection with KTN NDA, local roads, cycle tracks, drainage, sewerage, waterworks, pumping stations, fresh water and flushing water service reservoirs, and landscaping works
Cycle Tracks Connecting North West New Territories with North East New Territories	NA	The Project is to construct a cycle track branching off section and associated supporting facilities alongside Sam Mun Tsai Road in Tai Po.
Tung Chung New Town Extension	NA	The Project is to further develop the Tung Chung New Town (TCNT) into a comprehensively planned new town with a larger population capacity and adequate local and regional community facilities.
Trunk Road T4	NA	The works mainly include construction of a dual two-lane trunk road approximately 2.3 kilometres in length with slip roads connecting Shing Mun Tunnel Road / Tsing Sha Highway and Sha Tin Road;

Source: Civil Engineering and Development Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

11

Overview of Macro Economy in Hong Kong

Capital Projects under Construction and Planning in Hong Kong

➤ According to the Civil Engineering and Development Department (CEDD) of Hong Kong, there are approximately 25 projects under planning and 55 projects under construction, as of April 2024. The below table sets forth the major construction projects in Hong Kong.

Projects	Period	Description
Kai Tak Development Plan	2009-2025	It is a development project with a total planning area of over 320 hectares that covers the ex-airport site. It has the largest land fronting Victoria Harbour among the infrastructural developments in Hong Kong. It provides quality living and working environment for around 90,000 residents and 80,000 personnel and professionals.
Three-runway System (3RS)	2016-2024	Upon the completion of the 3RS, HKIA will be able to serve 30 million additional passengers annually as forecasted in the HKIA Master Plan 2030. The passenger building facilities of the 3RS could be further expanded if necessary.
Tseung Kwan O further development	NA	This is a project to further develop the infrastructural works for Tseung Kwan O Stage I Land fill site, including a footbridge across the southern part of the Eastern Channel of Junk Bay; and a sewage pumping station and sewerage works for proposed developments in the Stage I Landfill. Further, Tseung Kwan O – Lam Tin Tunnel will also improve the traffic conditions within Kwun Tong District and relieve the extra traffic load to be brought about by the future development of the district.
Trunk Road T2	2022-2026	The scope of the project comprises a dual two-lane trunk road and associated buildings and traffic control and surveillance system.
Site formation of Publish Housing in Tin Wah Road, Lau Fau Shan/ Sha Po, Yuen Long/ Shap Pat Heung, Yuen Long/ Tai Kei Leng, Yuen Long/ Ma On Shan Tsuen Road/ A Kung Ngam Village, Eastern/ near Chai Wan Swimming Pool, Chai Wan/ San Hing Road and Hong Po Road, Tuen Mun/ Ka Wai Man Road and Ex-Mount Davis Cottage Area, Kennedy Town/ Pik Wan Road, Yau Tong	NA	Projects involve site formation works including site clearance and land decontamination works, geotechnical works, sewage and drainage works, roadworks and ancillary works

Source: Civil Engineering and Development Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

12

Overview of Macro Economy in Hong Kong

Northern Metropolis

- Besides, the Northern Metropolis development will create significant opportunities for the electrical construction works sector. In particular, the San Tin Technopole focusing on technology development requires extensive electrical cable works to establish the necessary power distribution networks and data communication infrastructure for the advanced manufacturing facilities and laboratories. The development of data centers and 5G infrastructure to support the I&T industry in the Northern Metropolis will involve substantial electrical cable works to ensure reliable power supply and high-speed data transmission.
- Moreover, the Northern Metropolis development places a strong emphasis on sustainability and green living. The Northern Metropolis Action Agenda published in 2023 mentions that the Northern Metropolis will be a sustainable carbon-neutral community, helping Hong Kong meet the target of carbon neutrality before 2050. The focus on sustainability will drive the adoption of renewable energy systems in the development of various facilities and infrastructure. For instance, the construction of the "Northern Metropolis University Town" and the various I&T facilities will likely incorporate solar power systems, wind turbines, and other renewable energy technologies to reduce their carbon footprint. The installation and maintenance of these renewable energy systems will generate significant opportunities for the electrical construction works sector.
- Furthermore, the development of smart city infrastructure, such as smart mobility, smart energy management, and smart waste management systems, will require the integration of renewable energy systems and advanced electrical cable works. The implementation of these smart city solutions will involve the installation of sensors, controllers, and communication networks, all of which will require the expertise of the electrical construction works sector in the areas of electrical cable works and renewable energy system integration.



-  High-end Professional Services and Logistics Hub
-  Innovation and Technology Zone
-  Boundary Commerce and Industry Zone
-  Blue and Green Recreation, Tourism and Conservation Circle

Source: Frost & Sullivan

Overview of Macro Economy in Hong Kong

Introduction of Smart Site Safety System (“SSSS”)

The Hong Kong Government has been actively promoting the adoption of smart safety systems in the construction industry to enhance site safety. In March 2023, the Development Bureau issued a technical circular, outlining the implementation of the Smart Site Safety System (“SSSS”) in public works contracts. The SSSS covers 10 main categories, including a central management platform, digitalised tracking system for site plants, powered tools and ladders, digitalised permit-to-work system for high risk activities, hazardous areas access control by electronic lock and key system, unsafe acts / dangerous situation alert for mobile plant operation danger zone, unsafe acts / dangerous situation alert for tower crane lifting zone, smart monitoring devices for workers and frontline site personnel, safety monitoring system using Artificial intelligence (“AI”), confined space monitoring system and safety training with virtual reality technology. The SSSS is applicable to various types of construction sites, such as civil works, site formation works, utility works, building works etc. It is expected that around 500 worksites (including public works and private works), representing more than 60 % of the total number of construction sites in Hong Kong, will be participating in the scheme and labels were issued to the first batch of around 110 worksites in July in 2024 and the remaining will be largely completed by the end of 2024.

The aim of SSSS is to comprehensively improve the safety management level of construction sites through technological means. The circular mandates the adoption of SSSS in all public works contracts with a value exceeding HK\$30 million. The government has also introduced a labelling scheme to recognize construction sites that have adopted smart safety technologies, aiming to have more than 60% of existing sites join the scheme by the end of the year.

To support the adoption of SSSS particular to private projects, the Construction Industry Council (CIC) has introduced a funding scheme under the Construction Innovation and Technology Fund (CITF). The scheme provides subsidies for the purchase of pre-approved smart safety products, with each applicant eligible for up to HK\$6 million in funding. The government has also indicated its intention to expand the scope of the subsidy to include IT and sourcing support in the future, further encouraging the industry to embrace smart safety technologies.

Competent players in the construction industry are actively developing and applying SSSS in their projects, aligning with the government’s policies and industry development trends. Besides, some construction firms are also collaborating with universities, research institutions and technology companies to create more customised and innovative solutions, such as alarm system that ensure information can be transmitted in real-time in the construction sites, that can in turn enhance site safety and improve overall efficiency. Overall, with the government’s support and the industry’s proactive approach, the widespread implementation of SSSS is poised to drive significant improvements in construction safety and efficiency in the coming years.

In May 2024, the SSSS scheme was successfully launched jointly by the Development Bureau and the Construction Industry Council. As of July 2024, the first batch of 110 public and private construction sites participating in the SSSS scheme has passed the assessment and were issued label plaques. These sites, involving different works types and scales, have properly adopted the SSSS. The scheme has received applications from more than 350 construction sites in the first two months since its launch in May 2024, with assessments being conducted progressively. The rapid uptake demonstrates the construction industry’s commitment to embracing smart safety technologies and aligns with the government’s goal of improving site safety through technological means.

The first batch of 110 public and private construction sites participating in the 4S Labelling Scheme has passed the assessment and were issued label plaques on July 29 2024 to indicate the proper adoption of 4S at their respective construction sites.

Source: Frost & Sullivan

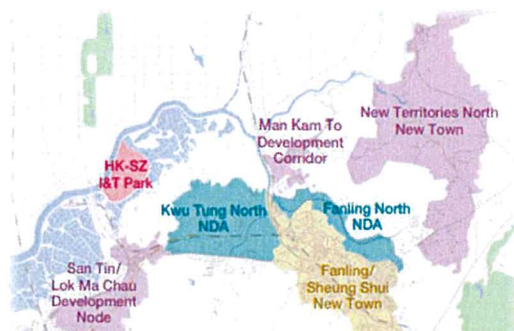
Agenda

1	Introduction of the Research
2	Overview of Macro Economy in Hong Kong
3	Overview of Hong Kong Civil Engineering Market
4	Overview of Hong Kong Electrical Construction Works Market
5	Competitive Landscape of Hong Kong Civil Engineering Market
5	Competitive Landscape of Hong Kong Electrical Construction Works Market

Overview of Macro Economy in Hong Kong

Northern Metropolis

- The Northern Metropolis Development Strategy was first proposed by the Hong Kong Government in October 2021. It aims to transform the northern part of Hong Kong into a thriving metropolitan area that is ideal for living, working, and traveling. The Northern Metropolis will cover an area of 30,000 hectares to be developed into a area with highly concentrated residential units, working population and enterprises., encompassing the existing new towns of Yuen Long, Tin Shui Wai, Fanling, and Sheung Shui, as well as various New Development Areas (NDAs) at different planning and development stages.
- The new development land within the Northern Metropolis is expected to provide over 500,000 new residential units and create around 500,000 new jobs, accommodating a population of 2.5 million upon full development.



- The Northern Metropolis development will have a significant impact on the civil engineering and construction sector in Hong Kong. In particular, the development of the "Northern Metropolis University Town" will require the construction of new campuses and facilities, with the government reserving more than 60 hectares of land in Hung Shui Kiu / Ha Tsuen, Ngau Tam Mei, and New Territories North New Town for this purpose. The construction of the Hong Kong-Shenzhen Innovation and Technology Park (HSITP) in the Loop and the adjacent Shenzhen I&T Zone will also involve substantial civil engineering work to develop the necessary infrastructure and buildings. Furthermore, the development of the four major zones, namely High-end Professional Services and Logistics Hub, I&T Zone, Boundary Commerce and Industry Zone, and Blue and Green Recreation, Tourism and Conservation Circle will necessitate the construction of various commercial, industrial, and recreational facilities. Lastly, the planned transport infrastructure projects, such as the Hong Kong-Shenzhen Western Rail Link (Hung Shui Kiu – Qianhai), Northern Metropolis Highway, and Route 11, will require extensive civil engineering work, contributing to the growth of the sector. As estimated by the Development Bureau, the total cost of projects in the Northern Metropolis will exceed \$224.7 billion. The majority of this expenditure, \$121.5 billion, is allocated for land resumption in four key areas: Kwo Tung North, Fanling North, San Tin, and the San Tin Technopole. Site formation and infrastructure development make up a significant portion of the total cost, amounting to approximately \$99.3 billion or 44% of the overall expenditure. Additionally, \$3.1 billion has been set aside for detailed design work, while studies account for a further \$610 million.

Source: Frost & Sullivan

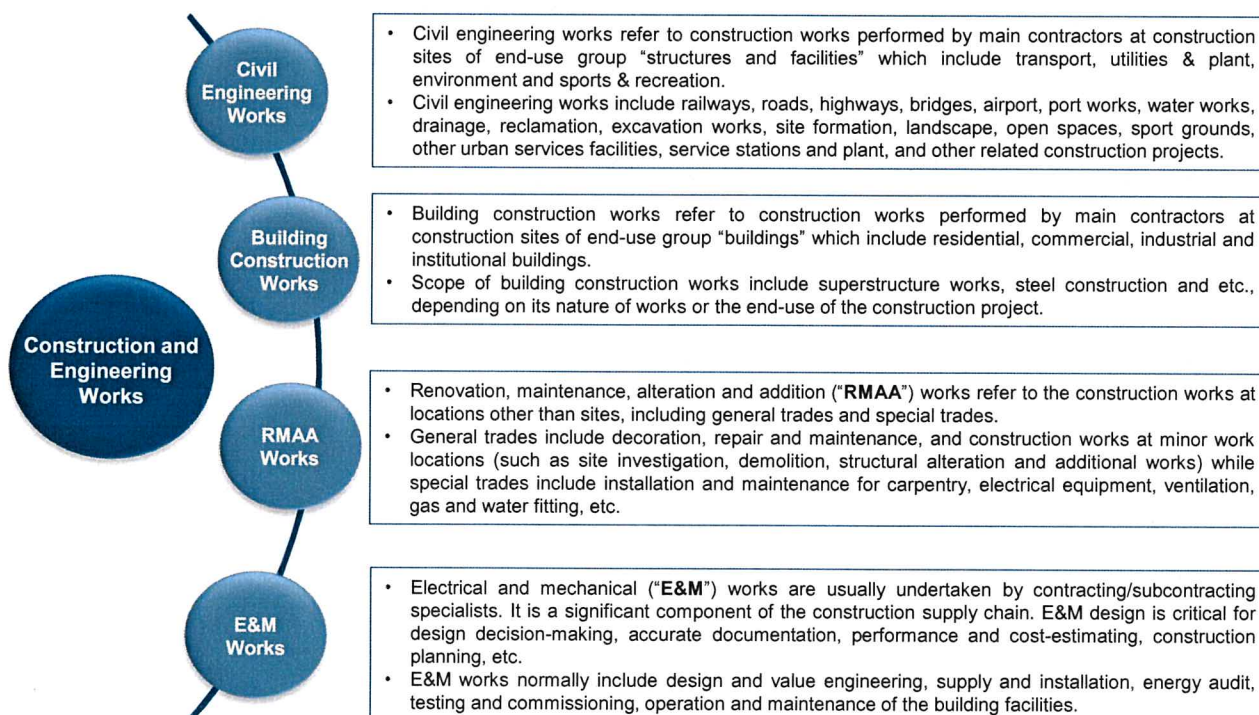
16

FROST & SULLIVAN

Overview of Hong Kong Civil Engineering Market

Classification of Construction and Engineering by Nature of Works

- Construction industry can be broadly classified by following nature of works:



Source: Frost & Sullivan

FROST & SULLIVAN

17

Overview of Hong Kong Civil Engineering Market

Definition and Segmentation of Civil Engineering

- Civil engineering encompass a wide variety of works that include the design, construction and maintenance of infrastructure, namely roads, bridges, tunnel, dams and power plants. According to Development Bureau, civil engineering works are generally classified into four segments, namely (i) ports works, (ii) roads and drainage, (iii) site formation, and (iv) waterworks.
 - Port works** refer to design, construction, improvement and maintenance of marine facilities, including public piers, ferry piers, dolphins, reclamations, seawalls, breakwaters, pumphouses and beaches.
 - Roads works** are usually grouped into two types, namely (i) construction of new roads, such as expressways, trunk roads, primary distributor roads, district distributor roads and local distributor roads, and (ii) maintenance of existing roads. **Drainage and other works** refer to construction, improvement and maintenance of sewage treatment facilities, storm water drainage facilities, as well as waste management and power plants.
 - Site formation works** include excavations on sloping land, filling, landslip preventive works, landslip remedial works, and ground water drainage works. These works are necessary to prepare a piece of land for foundation works and the subsequent construction of buildings and other structures through preparation of land with required orientation, shape or levels that can accommodate particularly buildings and facilities.
 - Waterworks** cover system that conveys fluids for a wide range of applications such as water and liquid supply, as well as vessel or conduit to funnel and discharge waste liquid. Generally, service scope of water works include installation of systems and components such as pipes and vessels, testing, inspection and maintenance.



Note: Structural works i.e. construction of various infrastructures are included under each of the categories. Construction of general buildings are categorised into "Building and Construction Works".

Source: Development Bureau, Frost & Sullivan

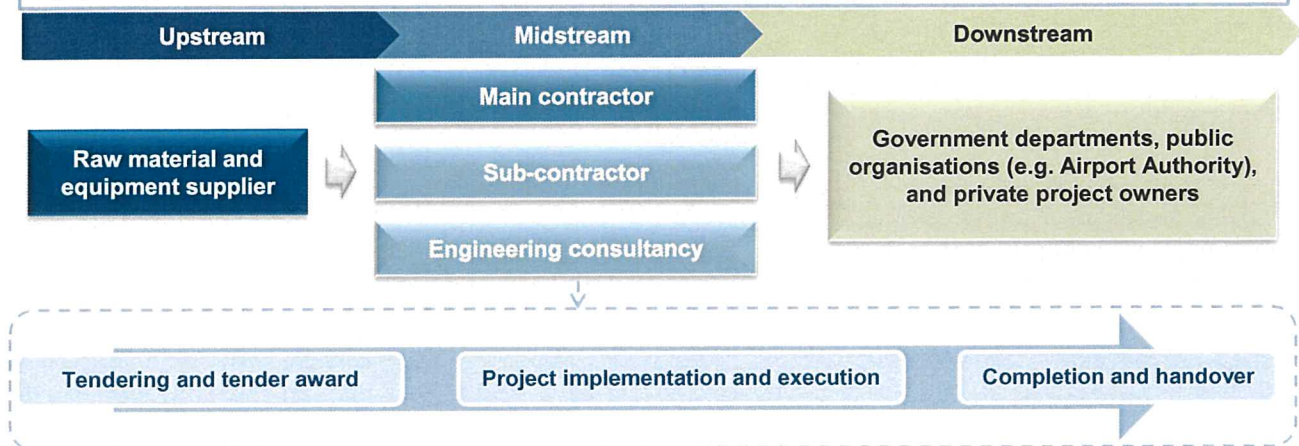
F R O S T & S U L L I V A N

18

Overview of Hong Kong Civil Engineering Market

Value Chain Analysis

- Below sets out the value chain of civil engineering works, comprising upstream raw materials and equipment supplier, midstream contractors and engineering consultancy and downstream clients such as government departments, public organisations and private project owners.
- Subcontracting is a common practice in civil engineering industry whereby main contractors subcontract the large scale projects to other contractors with specialist licenses or capabilities in certain areas, including road and drainage works, port works and site formation, based on the track records, business relationship and capital requirements. In public sector, leading main contractors tender for the projects from government and government related organizations, which are then assigned to one or more subcontractors. Generally, main contractors with eligibility for undertaking public works are registered under respective work categories and tender group in the List of Approved Contractors of Development Bureau. While for contractors who wish to carry out building or street works for private developments in Hong Kong, should also apply for registration as a registered contractor (RC) under the Building Ordinance (BO), as building and street works are only permitted to be completed by contractors who are registered and fully versed with the applicable regulatory requirements as well as the current building control system.
- Joint venture, which refers to a business form that two or more person or entity engaged in a single defined project, is generally adopted by contractors for sizable civil engineering works. Key benefits of joint venture include enhancement of resources (e.g. capital and equipment) and technical expertise, as well as share the risk and costs involved. Establishment of joint venture is required for some large-scaled infrastructure projects by public owners.



Source: Frost & Sullivan

F R O S T & S U L L I V A N

19

Overview of Hong Kong Civil Engineering Market

Value Chain Analysis

- In the civil engineering market, variation orders are common and in line with industry practices, where downstream clients may demand additions and/or modifications on the original scope of work from time to time in different stages of a project. Additional work may include minor on-site out-of-scope works, dismantling completed works and re-working due to changes in architectural and/or layout designs and procurement and installation of additional systems.
- Further, it is common in the industry that a contractor may pay on behalf of its subcontractors for certain expenses in a civil engineering project regarding the procurement of materials encompassing raw materials. For certain common construction materials, the main contractor will normally purchase the materials for subcontractors to ensure the material quality, and to achieve cost benefit from suppliers due to bulk purchases. Such expenses are typically deducted from the customer's payments to the subcontractors when agreeing the amount of the interim payments. The payment arrangement is commonly known as "contra-charge arrangement", which is practised commonly in the industry.
- When selecting a contractor, budget is inevitably a critical factor for clients in both the public and private sectors. However, there is no scarcity of companies in the industry that possess an abundance of experience in managing civil engineering projects and can offer customized services and application knowledge that foster a degree of interdependence with the client while remaining cost-effective and dependable. As a result, client concentration is a common occurrence within the civil engineering sector, in both public and private sector.
- The availability of construction works in Hong Kong depends on the Hong Kong Government's spending on construction and infrastructure in Hong Kong and its land supply policy, the approval of the Legislative Council of Hong Kong, and the investment plans and strategies of property developers.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

20

Overview of Hong Kong Civil Engineering Market

Industry Standard, Qualifications and Regulations (1/3)

Regulation	Department	Description
Approved Contractors List- Development Bureau	Development Bureau	<p>In order to tender for public sector projects, a contractor should be accepted on the Approved Contractors List maintained by the Development Bureau. The Approved Contractors List comprises contractors who are approved for carrying out public works in one or more of the five major categories of building and civil engineering works; i.e. (1) "Buildings", (2) "Port Works", (3) "Roads and Drainage", (4) "Site Formation" and (5) "Waterworks". Although approvals granted by the Development Bureau are not subject to renewal, approved contractors are required to meet the financial, technical, management, personnel and safety criteria applicable to their respective category to maintain their status on the approved lists and for the award of public works contracts. The Development Bureau may take regulatory actions, such as removal, suspension and downgrading, against approved contractors under certain circumstances.</p> <p>Generally, there are three groups in each of the five major categories of building and civil engineering works (arranged in ascending order): Group A (except that there is no Group A in the port works and site formation categories), Group B and Group C. Each group has its particular tendering limits. The following table sets out the value of works for which contractors in the respective categories and statuses may tender in the capacity of a main contractor:</p>

Category	Authorised contract value
Group A	Contracts of value up to HK\$100 million
Group B	Contracts of value up to HK\$300 million
Group C	Contracts of any values exceeding HK\$300 million

Source: Frost & Sullivan

F R O S T & S U L L I V A N

21

Overview of Hong Kong Civil Engineering Market

Industry Standard, Qualifications and Regulations (2/3)

Regulation	Department	Description
Registered Specialist Trade Contractors Scheme ("RSTCS")	Construction Industry Council	<p>The development bureau requires that all public works contractors with tenders to be invited on or after 15 August 2004 to employ all sub-contractors registered from the respective trades available under the Registered Specialist Trade Contractors Scheme. In order to be eligible for tendering public works in relation to respective civil engineering works directly from the Government as contractors, contractors are required to register on the List of Approved Contractors for Public Works or on the List of Approved Specialist Contractors for Public Works, depending on the type of works to be undertaken and the nature of the site location. Contractors shall meet certain criteria in the area of financial, technical and management.</p> <p>Where a contractor is to sub-contract, or a subcontractor is to further sub-contract part of the public works involving trades available under the Primary Register of the Registered Specialist Trade Contractors Scheme, he shall engage all subcontractors (whether nominated, specialist or domestic) who are registered under the relevant trades in the Primary Register of the Registered Specialist Trade Contractors Scheme.</p>
General Specification for Civil Engineering Works, Vol. 1 & 2	Civil Engineering and Development Department	The guidance sets out the quality of materials, the standards of workmanship, the testing method and the acceptance criteria for different types of civil engineering works such as earthwork, drainage work undertaken for the Government of the Hong Kong Special Administrative Region.

Source: Frost & Sullivan

F R O S T  S U L L I V A N

22

Overview of Hong Kong Civil Engineering Market

Industry Standard, Qualifications and Regulations (3/3)

Regulation	Department	Description
Registered Electrical Contractors	Electrical & Mechanical Services Department	This register provides members of the public with a list of electrical contractors who are registered to carry out electrical work in Hong Kong. It also enables the public to check information on and the authenticity of registered electrical contractors listed.
DSD Advice Note No. 2 – How to make Drainage Connections	Drainage Service Department	This Note explains the procedures and requirements for connecting foul sewers and stormwater drains from privately owned or controlled lots to public drainage systems.
Hong Kong Planning Standards And Guidelines	Architectural Services Department	This guideline is a manual of criteria for determining the scale, location and site requirements of various land uses and facilities including internal transport facilities.
Practice Notes for Registered Contractors	Building Department	The practice note provide the guidance for Registered Contractors on how to apply and enforce the Building Ordinance and its subsidiary regulations as well as other administrative and advisory matters in the administration of the Building Ordinance related to Registered Contractors, including Minor Works Contractors Registration.
Practitioner's Guidelines - Arrangement for Private Developers to employ their own Contractors to carry out Drainage Connections	Development Bureau	The guideline allows developers and authorised persons could now employ approved contractors to carry out public drainage / sewage system connection, water supply connection and construction of run-ins and repair of damaged footpaths.
Guidance Notes on Road Pavement Drainage Design	Highway Department	This guidance provides the standard design of road pavement and drainage applicable to the Hong Kong Special Administrative Region .

Source: Frost & Sullivan

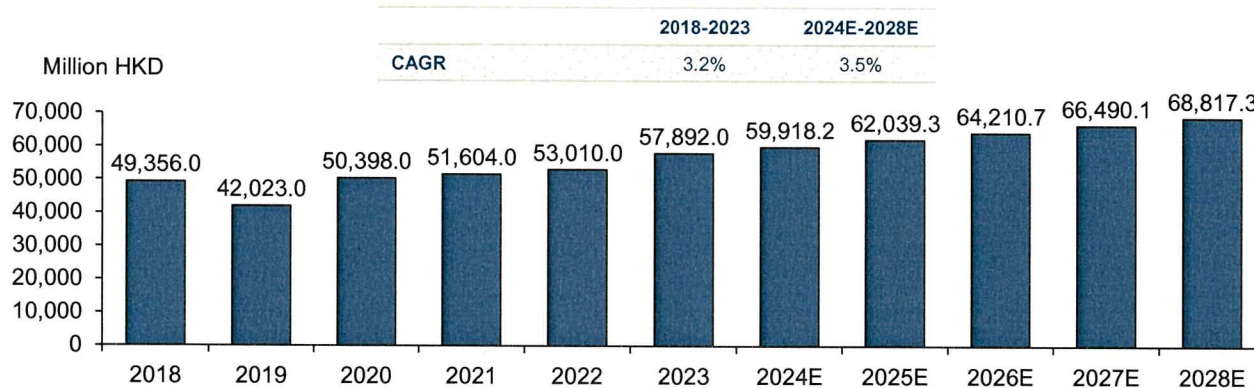
F R O S T  S U L L I V A N

23

Overview of Hong Kong Civil Engineering Market

Gross Value of Civil Engineering Works

Gross Value of Civil Engineering Works by Main Contractors (Hong Kong), 2018-2028E



Note: Data refers to gross value of civil engineering works in nominal terms performed by main contractors at construction sites.

- Since the completion of large scale infrastructure projects in 2018, such as Hong Kong–Zhuhai–Macau Bridge and Express Rail Link (Hong Kong section), along with the social unrest and the outbreak of COVID-19, the civil engineering industry in Hong Kong has become temporarily sluggish since 2019. However, the backlog of construction demand from previous years has been largely released in the last two years. According to Census and Statistics Department, the gross value of civil engineering works performed by main contractors in Hong Kong recorded an overall incline from approximately HKD49,356.0 million in 2019 to HKD57,892.0 million in 2023, representing a CAGR of approximately 3.2%. The increase in 2023 was due to the Commencement of stage 2 of phase 2 of Improvement works at Mui Wo and Phase 2 of Site Formation and Infrastructure Works for the Development of ex-Cha Kwo Ling Kaolin Mine Site.
- The rollout and commencement of projects such as Kwun Tung North (KTN) and Fanling North (FLN) New Development Area (NDA) development, Kau Yi Chau Artificial Island under the Lantau Tomorrow Vision, Tung Chung New Town Extension in the coming few years, shall sustain demand for civil engineering works, the gross value of civil engineering works in Hong Kong is expected to increase at a CAGR of 3.5% during 2024 to 2028.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

24

Overview of Hong Kong Civil Engineering Market

Gross Value of Civil Engineering Works (Cont'd)

- The Northern Metropolis development will have a significant impact on the civil engineering and construction sector in Hong Kong. In particular, the development of the "Northern Metropolis University Town" will require the construction of new campuses and facilities, with the government reserving more than 60 hectares of land in Hung Shui Kiu / Ha Tsuen, Ngau Tam Mei, and New Territories North New Town for this purpose. The construction of the Hong Kong-Shenzhen Innovation and Technology Park (HSITP) in the Loop and the adjacent Shenzhen I&T Zone will also involve substantial civil engineering work to develop the necessary infrastructure and buildings. Furthermore, the development of the four major zones, namely High-end Professional Services and Logistics Hub, I&T Zone, Boundary Commerce and Industry Zone, and Blue and Green Recreation, Tourism and Conservation Circle will necessitate the construction of various commercial, industrial, and recreational facilities. Lastly, the planned transport infrastructure projects, such as the Hong Kong-Shenzhen Western Rail Link (Hung Shui Kiu – Qianhai), Northern Metropolis Highway, and Route 11, will require extensive civil engineering work, contributing to the growth of the sector

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

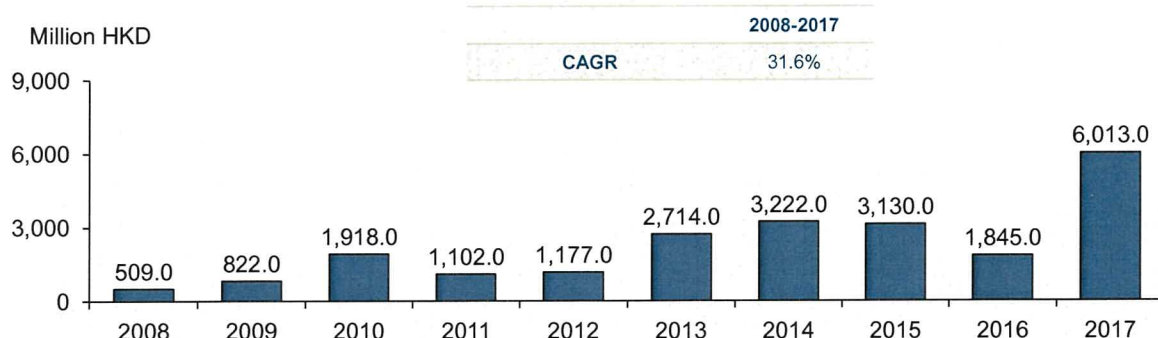
F R O S T & S U L L I V A N

25

Overview of Hong Kong Civil Engineering Market

Gross Value of Site Formation and Clearance Works

Gross Value of Site Formation and Clearance Works by Main Contractors (Hong Kong), 2008-2017



Note: Data refers to gross value of site formation and clearance works in nominal terms performed by main contractors at construction sites.

- The Gross Value of Site Formation and Clearance Works tends to be more volatile compared to other construction works. Site formation and clearance works involve activities such as land excavation, leveling, and preparation before construction can begin. These activities are typically carried out at the early stages of a construction project. The gross value of site formation and clearance works ranged from HKD509.0 million to HKD6,013.0 million during 2008 to 2017, with the CAGR of 31.6%.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

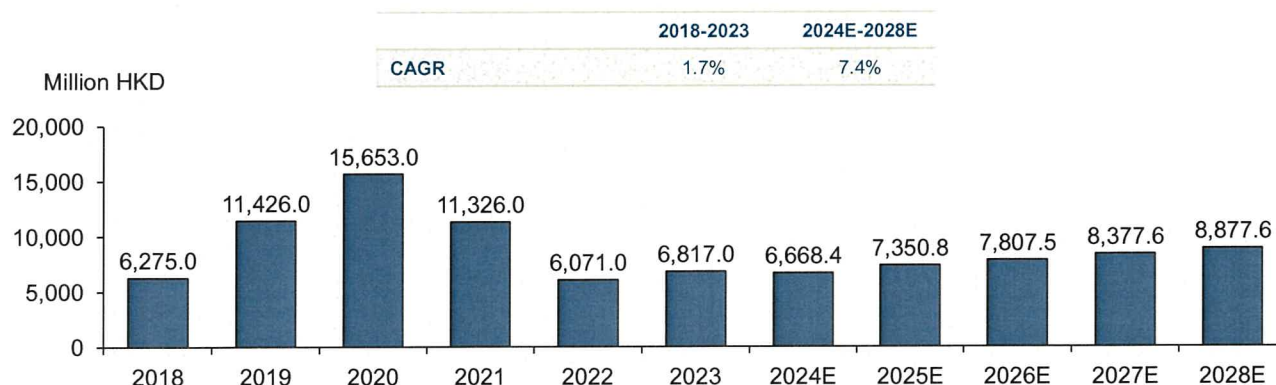
FROST & SULLIVAN

26

Overview of Hong Kong Civil Engineering Market

Gross Value of Site Formation and Clearance Works

Gross Value of Site Formation and Clearance Works by Main Contractors (Hong Kong), 2018-2028E



Note: Data refers to gross value of site formation and clearance works in nominal terms performed by main contractors at construction sites.

- According to the Census and Statistics Department, the gross value of site formation and clearance works registered an overall growth from approximately HKD6,275.0 million in 2018 to HKD6,817.0 in 2023, representing a CAGR of 1.7%. The robust growth during 2019 and 2020 was mainly attributable to the tender award and commencement of site formation and associated infrastructural works for new development areas, such as Kwun Tung North and Fanling North New Development Area. The drop in 2022 and 2023 was due to the completion of site formation and infrastructure works at Yau Yue Wan and Pak Shing Kok, Columbarium Development at Sham Shui Kok, Cheung Muk Tau and Public Housing Development at ex-Mount Davis Cottage Area in Kennedy Town.
- The commencement of development projects and construction works, namely the Development of ex-Cha Kwo Ling Kaolin Mine Site, Queen's Hill Extension, Tuen Mun Central Phase 2, Kwok Shui Road, Choi Shun Street, Development of ex-Cha Kwo Ling Kaolin Mine Site (Phase 2) and Public Housing Developments at Chak On Road South, supports the market demand for site formation works. Attributable to the planned infrastructure development projects, the gross value of site formation and clearance works is forecasted to increase at a CAGR of 7.4% during the period from 2024 to 2028.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

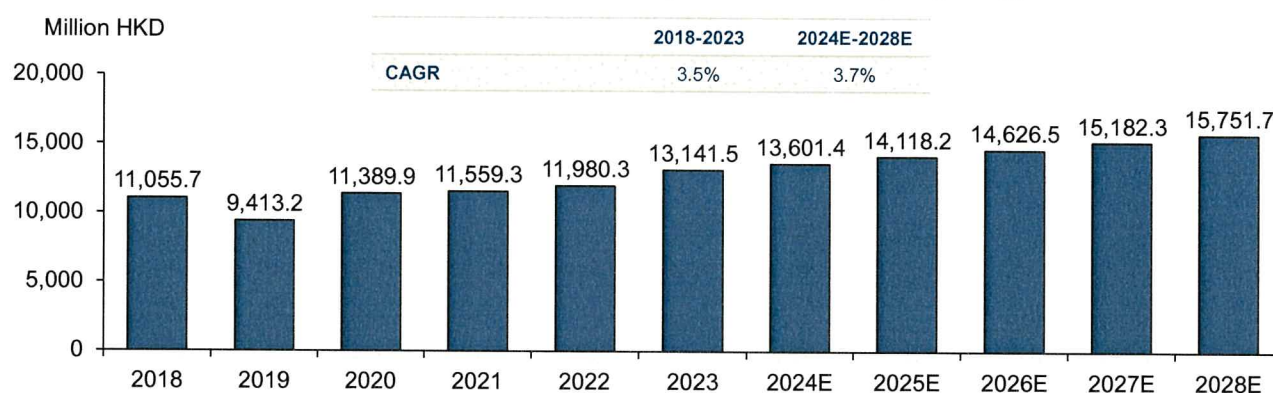
FROST & SULLIVAN

27

Overview of Hong Kong Civil Engineering Market

Gross Value of Construction Works for Roads and Drainage

Gross Value of Roads and Drainage Works by Main Contractors (Hong Kong), 2018-2028E



Note: Data refers to gross value of roads and drainage works in nominal terms performed by main contractors at construction sites.

- The gross value of roads and drainage in Hong Kong has witnessed a moderate increase from HKD11,055.7 million in 2018 to HKD13,141.5 million in 2023, mainly attributed to large-scale road construction and improvement projects, including the Central Kowloon Route, Widening of Western Section of Lin Ma Hang Road between Ping Yuen River and Ping Che Road, Braemar Hill Pedestrian Link, Flyover from Kwai Tsing Interchange Upramp to Kwai Chung Road, Improvement works at Tsuen Tsing Interchange and so on. The drop in 2019 was due to the completion of construction of dual 2-lane Connecting Road linking up the BCP with Fanling Highway.
- Looking forward, Development at Anderson Road and Kwok Shui Road are expected to boost the development of civil engineering sector in Hong Kong, and the gross value of roads and drainage in Hong Kong is expected to reach HKD15,751.7 million in 2028, at a CAGR of 3.7% from 2024 to 2028.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

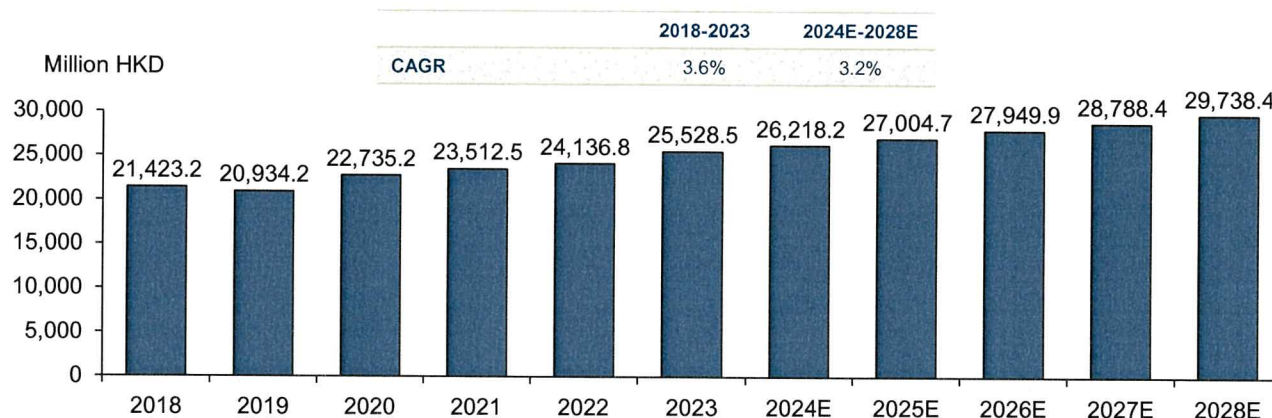
F R O S T & S U L L I V A N

28

Overview of Hong Kong Civil Engineering Market

Gross Value of Construction Works for Foundation

Gross Value of Foundation Works by Main Contractors (Hong Kong), 2018-2028E



Note: Data refers to gross value of foundation works in nominal terms performed by main contractors at construction sites.

- The gross value of foundation works registered an overall growth from approximately HKD21,423.2 million in 2018 to HKD25,528.5 million, representing a CAGR of 3.6%. The foundation works are at the early stage of the contraction planning and therefore, the social unrest in the second half of 2020, had limited short-term impact on the foundation works market in the 2019. Market demand for foundation works is highly dependent on the commencement of development projects and construction works. The robust growth was mainly attributable to the expedited housing development and the healthy growth of construction industry in Hong Kong as a whole. Attributable to the planned infrastructure development projects and the increase of land supply, the gross value of foundation works is anticipated to increase at a CAGR of 3.2% for the next five years, reaching HKD29,738.4 million in 2028.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

29

Overview of Hong Kong Civil Engineering Market

Market Drivers (1/3)

Constant demand for infrastructural works

Government spending on infrastructure has demonstrated stability, increasing at a CAGR of 0.7% from HK\$85.6 billion in 2018 to HK\$88.7 billion in 2023. The Government intends to maintain its commitment to infrastructure investment, as stated in the 2024/2025 Budget Speech, it is projected that annual capital works expenditures will increase to HKD105.8 billion in 2024/2025 representing an increase of 13.5% from HK\$93.3 billion in 2018/2019. Additionally, the average annual capital works expenditure will be about \$90 billion in the next five years, representing an increase of about 17% over the average annual expenditure of \$76 billion in the past five years, according to the latest speech in May 2024 from the Development Bureau. Much of the future works expenditure will be invested in the development of the Northern Metro Area and in taking forward other land creation projects. The expenditure limit for each minor project funded in relation to public facilities and various infrastructure sites was increased in the aforementioned policy address. The implementation of the Long Term Housing Strategy, which ensures a continuous supply of housing, and the development of new town extension projects such as Tung Chung, Kai Tak, Kwu Tung North, Fanling North, Hung Shui Kiu, and Yuen Long South are anticipated to increase demand for the construction of related infrastructural facilities in the nearby. This includes the expansion of power and pumping stations, tunnels, bridges, and mass transit railway systems. As a result, it is anticipated that the rapid implementation of public infrastructure projects and urban development will provide Hong Kong's civil engineering sector with sustained growth.

Rising of environmental related structures and facilities

As Hong Kong rapidly urbanizes, the government has implemented a range of policies concerning environmentally sustainable infrastructure and facilities in an effort to strike a balance between social welfare and economic progress. In the coming years, expansion is anticipated not only in conventional environmental infrastructure such as waste management systems and sewage collection, treatment and disposal systems, but also in the construction of offshore liquefied natural gas terminals and numerous new energy facilities including solar power plants. The "Blue-Green Infrastructure" initiative, which seeks to improve the drainage system throughout the city, will additionally advance environmental civil engineering projects. Concurrently, the Architectural Services Department continues to advocate for the adoption of environmentally friendly and intelligent practices on construction sites. This includes expanding the utilization of renewable energy technologies, constructing temporary transformers, installing energy-efficient lighting systems, employing smart sensors, etc.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

30

Overview of Hong Kong Civil Engineering Market

Market Drivers (2/3)

Consistent government support

In response to personnel shortages and ageing workforces, which are obstacles in the construction industry, the Hong Kong government has increased its financial assistance efforts to improve industry standards. The Government of Hong Kong intends to allocate HK\$100 million to the Construction Industry Council in the Budget for 2023–2024 in order to support manpower training. This funding will be used to increase the number of training places and the allowance for trades experiencing labour shortages in an effort to attract new entrants and job changers. In addition, in order to ensure an adequate workforce, the government implemented the Labour Importation Scheme for the Construction Sector. As a vital subsegment of the Hong Kong construction industry, the civil engineering works industry is anticipated to benefit from the aforementioned government initiatives, particularly those undertaken by the Construction Industry Council. Accordingly to Construction Industry Council, the labour shortage in construction section in Hong Kong would be 40,000 in 2027. The Supplementary Labour Scheme was introduced by the Hong Kong Government in 2023 to alleviate the manpower shortage across different sectors in Hong Kong. In particular, Hong Kong is set to import around 12,000 workers in a bid to alleviate the labour crunch in the construction sector, filling in approximately 30% of the shortage in 2027.

Sustainable development plan for transportation structure and facilities

Transport structure and facilities are essential in enhancing connectivity within and beyond the city and contributes significantly to Hong Kong's long-term competitiveness and citizen's quality of life. According to the "Hong Kong Major Transport Infrastructure Development Blueprint" announced in 2023, which proposed nearly 40 transport infrastructure projects, including 20 railway or smart green mass transport system projects, and 18 major arterial roads, including more than 30 projects are expected to be completed within the next 15 years. In particular, the mass transit railway is partly commenced in 2023 and 2024, including Tuen Mun South Extension, and the construction of Northern Link, Kwu Tung Station, Tung Chung West Station, and Hung Sui Kiu Station. With well-planned expansion plan, the demand for transportation structure and facilities is expected to grow steadily.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

31

Overview of Hong Kong Civil Engineering Market

Market Drivers (3/3)

Trend in Adoption of Electric Equipment in Construction Sector

Green construction is crucial for mitigating climate change, conserving resources, improving energy efficiency, promoting occupant health, and meeting regulatory requirements. It offers numerous benefits to the environment, occupants, and the economy, making it an essential practice for the future of the construction industry. There is a rising trend in introducing electric equipment in the construction sector in Hong Kong to reduce carbon emissions and transition to more sustainable practices. HK Electric introduced a new comprehensive service in April 2021. This service aims to assist construction sites in achieving zero carbon emissions by replacing diesel generators with a reliable and sufficient supply of electricity from the grid. By doing so, it completely eliminates the negative effects of air and noise pollution caused by diesel generators on site workers and the surrounding community. Additionally, this initiative contributes to reducing the overall carbon footprint associated with the construction process. Sun Hung Kai Properties Limited made a notable announcement in February 2024, revealing their acquisition of nine electric construction equipment units. These newly acquired machines are intended to replace their existing diesel-powered counterparts. This strategic decision to transition towards electric equipment marks a significant milestone in the advancement of sustainable and environmentally-friendly construction practices. Sun Hung Kai Properties Limited's initiative also serves as a noteworthy example for the wider construction industry to follow in their pursuit of decarbonization and greener operations. The adoption of electric equipment produces fewer emissions compared to traditional diesel-powered machinery. This can help reduce air pollution and contribute to improved air quality in Hong Kong.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

32

Overview of Hong Kong Civil Engineering Market

Development Trends and Opportunities

Consistent Transition to Green Building

With the increasing awareness of environmental protection, the government has issued and continuously revised Buildings Energy Efficiency Ordinance (BEEO) to raise industry standards and promote market demand for energy efficiency solutions. Besides, the government is also continuously promoting sustainable building methods, such as modular integrated building (MiC) methods, to reduce construction waste. The industry is also actively involved, for instance, the Hong Kong Green Building Council (HKGBC) has also introduced the first-ever "Climate Change Framework for Built Environment" and "Zero-Carbon-Ready Building Certification Scheme" in 2023 to encourage the industry to adopt systematic and benchmark-driven approaches to reduce energy consumption. Therefore, green buildings will be a key development trend in the civil engineering industry.

Accelerating digitalization of construction industry

Hong Kong's construction industry to gradually move towards digitalisation. The Hong Kong Civil Engineering and Development Department (CEDD) has initiated the "BIM Horizontal Harmonization for BIM/GIS Integration" in the initial phase of the Kwu Tung North and Fanling North New Development Areas (NDAs) project that encourage all organisations engaged in public works in Hong Kong to adopt, which is expected to extend to future capital works projects or even private projects to support the development of smart cities. Furthermore, the Hong Kong Institute of Architects (HKIA) is actively engaged in advocating for the industry's integration of construction digitisation technology through its provision of training, accreditation of Building Information Modelling (BIM) credentials, and accreditation of training programmes, among other initiatives. Digital transformation of Hong Kong's infrastructure will proceed at an accelerated rate in the future.

Increasing cross-border projects

The Lok Ma Chau Loop project, situated in a transition zone between Shenzhen and Hong Kong, is positioned to evolve into a diverse region encompassing commercial, conservation, and community spaces. The development of this area has received substantial backing from the government, and the construction of necessary infrastructure is a prerequisite. Meanwhile, the Northern Line and the Hong Kong-Shenzhen Western Rail Link (Hung Shui Kiu - Qianhai) project will also be actively constructed in the coming years. Moreover, in August 2023, a Letter of Intent on Collaboration (LOI) was also signed between the Development Bureau (DEVB) and the Qianhai Authority of the Shenzhen-Hong Kong Modern Service Industry Cooperation Zone of Shenzhen Municipality (Qianhai Authority), aiming to further enhance the exchanges and co-operation between enterprises and professionals in architectural and engineering industries in the two places. Thus, the expansion of the civil engineering sector in Hong Kong will be aided by ongoing cross-border projects and potential cross-border cooperation.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

33

Overview of Hong Kong Civil Engineering Market

Threats and Challenges of Civil Engineering and Electrical Engineering Works Market

Higher labour cost and shortage of labour

As a result of immigration and the difficulty in attracting young people to enter the industry, declining birth rates, an ageing population, the civil engineering and electrical construction works market in Hong Kong has been confronted with severe shortages of skilled and experienced labour, which may result in increased construction costs and schedule delays. While the foreign labour importation scheme has been able to alleviate the labour shortage to a certain extent, there is still a need to take into account the 4-6 month processing cycle and the unfilled labor positions, as the Construction Industry Council projects that the qualified labour shortage in Hong Kong's construction sector is expected to rise from approximately 10,000 in 2023 to 40,000 in 2027. Hence, to retain and attract competent personnel, market participants might be required to implement strategies such as offering competitive compensation packages and providing flexible work schedules. The escalating competition for skilled personnel will lead to elevated labour expenses and present a hindrance to the growth of the civil engineering and electrical construction works sector in Hong Kong.

Higher material cost

Over the past five years, prices of major raw materials used in civil engineering and electrical construction works have generally experienced an increase. For example, prices of portland cement, bitumen and diesel fuel have increased from 2018 to 2023, representing CAGRs of approximately 5.2%, 5.6% and 8.1% respectively. Such increases in material cost will result in higher expenditures of civil engineering works, which may further negatively impact their profit margin.

Rising project complexity

After the end of the epidemic, construction projects in Hong Kong quickly resumed. In addition to facing tight project delivery dates, the civil engineering and electrical construction works industry in Hong Kong is also facing an increasing trend of engineering complexity, and customer demands are becoming increasingly complex, which may include higher requirements for building materials. Therefore, this leads to additional workload and expenses for market participants, including but not limited to the procurement of specific materials, increasing the number of employees, and recruiting relevant professionals.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

34

Overview of Hong Kong Electrical Construction Works Market

Cost Analysis – Labour Cost of Civil Engineering and Electrical Construction Works

Index of Labour Wages For Civil Engineering Contracts (Hong Kong), 2018-2023

2018=100	2018	2019	2020	2021	2022	2023	CAGR (2018-2023)	CAGR (2024E-2028E)
Electrical fitter (incl. electrician)	100.0	101.8	102.2	101.3	101.3	102.1	0.4%	0.5%

Average Daily Wages of Workers Engaged in Electrical Construction Works (Hong Kong), 2018-2023

HK\$	2018	2019	2020	2021	2022	2023	CAGR (2018-2023)	CAGR (2024E-2028E)
Electrical fitter (incl. electrician)	1,236.6	1,207.3	1,247.4	1,234.9	1,255.3	1,309.5	1.2%	1.0%
Cable joiner (power)	1,119.4	1,393.1	1,330.8	1,202.3	1,327.2	1,226.7	1.8%	1.6%
Plant & equipment operator (load shifting)	1,241.8	1,221.0	1,222.0	1,237.6	1,282.9	1,303.0	1.0%	0.8%

- The civil engineering sector commonly involves various types of labor, such as Concreters, Drainlayers, Bar bender and fixer, Metal Workers, General Welders, Structural Steel Welders, and so forth. The Labour Wage Index has demonstrated a mild increase from 100 in 2018 to 102.1 in 2023, at a CAGR of 0.4%. The primary factor contributing to the moderate increase observed in 2020 is labor shortages caused by the epidemic. Overall speaking, the public sector construction labor wage index has exhibited a relatively restrained climb, primarily propelled by social unrest in 2019, a decline in the completion of significant infrastructure projects subsequent to 2018, and the repercussions of the epidemic from 2020 to 2022, which have been compounded by inflationary pressures. The price index of labour wages for civil engineering contracts in Hong Kong is expected to rise at a CAGR of 0.5% from 2024 to 2028, driven by the sustained growth of civil engineering works and the associated demand for workers in Hong Kong.
- The average daily wages of workers engaged in electrical construction works such as cable trenching, laying and joining, and installation of solar panels in Hong Kong have demonstrated a positive trend between 2018 and 2023. All three key occupations including electrical fitters (including electricians), cable joiners (power), and plant & equipment operators (load shifting) has experienced a steady increase in their average daily wages over the five-year period, recording CAGRs of approximately 1.2%, 1.8% and 1.0% respectively. Cable joiners (power) witnessed the most significant growth. The upward trend in wages reflects the growing demand for skilled workers in the electrical construction works sector and the recognition of their expertise and contribution to the industry. With the increasing demand for electrical construction works, the average daily wages of workers engaged in electrical construction works in Hong Kong are expected to record positive growth from 2024 to 2028.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

35

Overview of Hong Kong Civil Engineering Market

Cost Analysis – Price Trends of Major Raw Materials

Price Trends of Major Raw Materials in Civil Engineering Works (Hong Kong), 2018-2023

(2017=100)	2018	2019	2020	2021	2022	2023	CAGR (2018- 2023)	CAGR (2024E- 2028E)
Steel reinforcement	139.6	133.5	128.6	205.4	196.5	163.4	3.2%	2.7%
Portland cement	93.2	96.2	98.7	106.2	120.7	120.2	5.2%	4.0%
Bitumen	131	139.4	133.7	150.5	172.7	171.7	5.6%	4.2%
Diesel fuel	132.2	139.1	137.7	158.5	191.5	194.7	8.1%	5.1%

- According to Census and Statistics Department, the price indices of major raw materials in civil engineering works, including steel reinforcement, Portland cement, bitumen, diesel fuel demonstrated stable increases during 2018 to 2023. The increase in the price index of steel reinforcement was mainly attributable to an exponential increase in downstream industries' demand such as demand for electrical and mechanical products along with the resumption of global economic activities since 2021. As the major element for Bitumen production, the rebound in crude oil price underpinned the significant increase in price of bitumen. The rise in price of cement is associated with the inputs commodity cost pressure such as coal and diesel. The gradual increase in diesel fuel is attributable to the increase substitution demand for natural gas given the fact of the high natural gas price in recent years.
- Advancements in technology may lead to more efficient and cost-effective machinery and equipment. This can contribute to lower rental prices as newer equipment may require less maintenance, have lower operating costs, or offer improved productivity. The PPI of rental of machinery and equipment decreased slightly during 2018 to 2023 with a CAGR of -1.7%.
- Going forward, the rising commodity prices and inflation rates, and sustained demand for construction works would continue to drive the prices of raw materials in civil engineering works in Hong Kong.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

36

Agenda

- 1 Introduction of the Research
- 2 Overview of Macro Economy in Hong Kong
- 3 Overview of Hong Kong Civil Engineering Market
- 4 **Overview of Hong Kong Electrical Construction Works Market**
- 5 Competitive Landscape of Hong Kong Civil Engineering Market
- 5 Competitive Landscape of Hong Kong Electrical Construction Works Market

F R O S T & S U L L I V A N

37

Overview of Hong Kong Electrical Construction Works Market

Definition and Segmentation of Electrical Construction Works

Introduction of Electrical Construction Works

Electrical construction works refer to the installation, upgrading, and maintenance of electrical systems in infrastructures, buildings and facilities. The scope of electrical construction works includes (i) installation of electrical wiring systems, such as conduits, cables, and associated components, to distribute electrical power and signals across cities and regions or throughout a building or facility, and (ii) the installation of various electrical equipment and devices, such as switchgear, transformers, circuit breakers, lighting fixtures, power outlets, and control systems. Electrical construction works involve both electrical works and necessary physical construction work that supports these activities, i.e. excavation, and structural work. Below sets out the three specialties of electrical works as outlined by the Construction Industry Council ("CIC"):

Electrical Wiring

The installation of wiring systems within buildings and structures to distribute and manage electrical power efficiently and safely. It includes laying out, cutting, and connecting wires and cables to fixtures, outlets, and electrical panels.

General Electrical Installation

Encompassing a wide range of services, including setting up essential electrical infrastructure like lighting systems, electrical outlets, and other related equipment in various environments.

Electrical Control and Power Panel Assembly

assembling and installing control panels that manage the flow and regulation of electrical power. Integrating various components, such as circuit breakers, switches, and relays, ensuring that they work together to manage electrical flow safely and efficiently.

Applicable Areas of Electrical Construction Works

Electrical Cable Works

including cable trenching, laying and joining

Other Infrastructural Power Distribution Systems

high-voltage overhead transmission lines, substations, transformers, and switchgear

Lighting Fittings

Various lighting fixtures and control system

Renewable Energy System

such as solar photovoltaic (PV) panels, wind turbines, and energy storage systems

Industrial Electrical Systems

Installation and wiring of industrial machinery and equipment

Building Electrical Systems

Wires, power distribution units, low-voltage building system

Source: Construction Industry Council, Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

Definition and Segmentation of Electrical Construction Works

Introduction to Key Aspects of Electrical Cable Works and Solar Photovoltaic Systems Installation Works

Electrical Cable Works refer to the specialized and infrastructural activities and processes involved in the installation, maintenance, and repair of underground cables used for electrical power transmission and distribution, as well as telecommunications purposes.

- **Cable Trenching:** It involves digging trenches in the ground to create a protected pathway for electrical cables. Trenching is critical for ensuring that cables are laid in a manner that protects them from external damage and minimizes electrical hazards.
- **Cable Laying:** Following trenching, cable laying involves the placement of electrical cables within the prepared trenches. Cable laying must be performed carefully to maintain the integrity and functionality of the electrical cables, ensuring they are correctly aligned and securely positioned.
- **Cable Jointing:** This task involves connecting individual sections of electrical cables to form a continuous electrical conduit. Proper cable jointing is essential for maintaining the electrical conductivity and performance of the network, and it requires specialised techniques to ensure durable and reliable connections.
- **Solar Photovoltaic Systems Installation and maintenance :** refers to the process of designing, planning, and installing solar PV panels and associated components to convert solar energy into usable electrical energy for residential, commercial, or industrial applications.



Segmentation of Electrical Cable Works

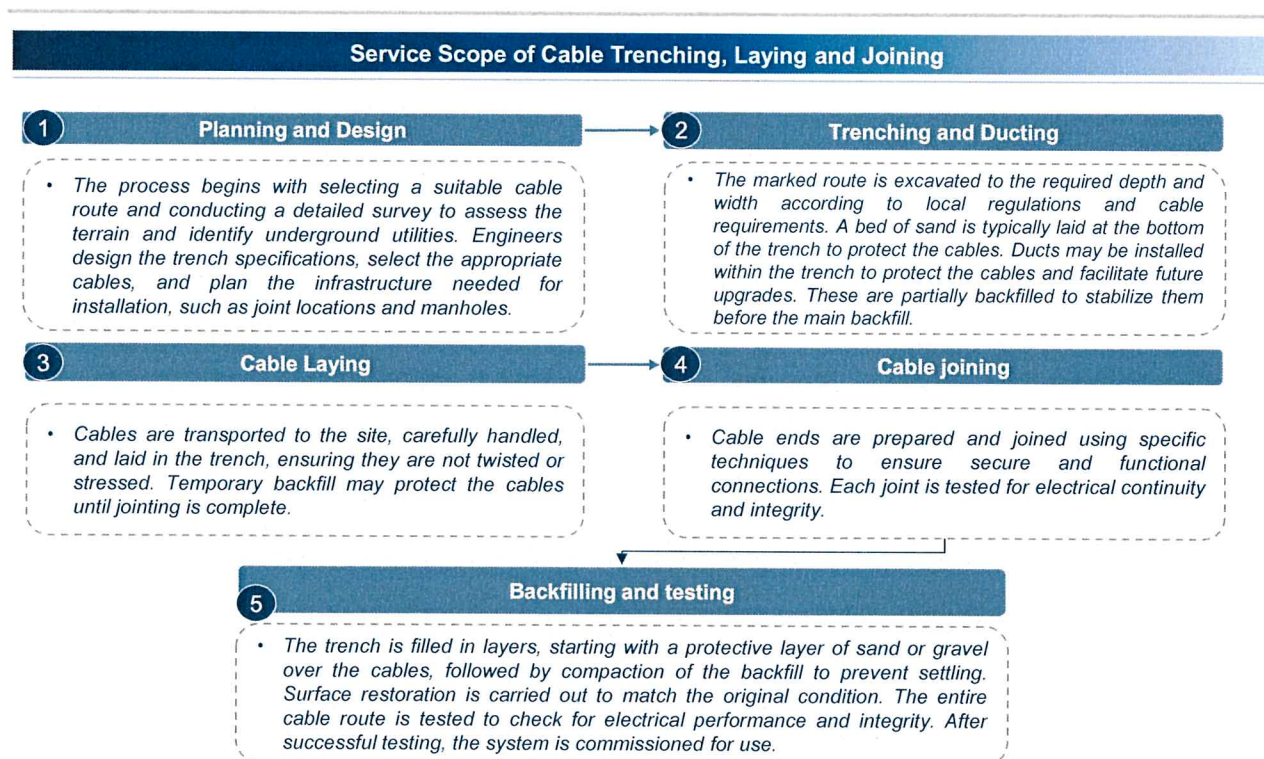
Electrical Cable Works can be further classified by

- By installation method: (i) **underground electrical cable works**, direct burial cables, cables installed in ducts or conduits; (ii) **overhead Electrical Cable Works**, cables suspended on utility poles and supported by towers or pylons; (iii) **submarine cable**. In this report, **electrical cable works** refers to (i) **underground electrical cable works**;
- By voltage Level: (i) **Low Voltage Electrical Cable Works**, Typically below 1 kV; (ii) **Medium Voltage Electrical Cable Works**, Typically between 1 kV and 36 kV; (iii) **High Voltage Electrical Cable Works**, Typically above 36 kV
- By usage: (i) **Electricity**; (ii) **Telecommunication**. In this report, **electrical cable works** refers to **underground electricity cable works**.

Source: Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

Service Scope



Source: Frost & Sullivan

40

FROST & SULLIVAN

Overview of Hong Kong Electrical Construction Works Market

Value Chain



- In the upstream phase, the primary activity is material sourcing which involves procuring high-quality, durable materials necessary for electrical installations, such as copper wires, photovoltaic panels, turbines, and various electrical components. Establishing and maintaining strong relationships with suppliers is crucial to ensure a continuous supply of these materials at competitive prices.
- The midstream segment is concerned with the physical construction and installation, which are central to establishing electrical infrastructure. The segment encompasses a broad scope of services provided by construction contractors, including the integrated process of cable trenching, laying, and joining. These contractors are responsible for ensuring that all aspects of the electrical installation meet the technical requirements and comply with local safety standards. The role of efficient project management is crucial here, as it involves overseeing the construction activities from start to finish, ensuring that the projects adhere to predetermined schedules, budgets, and regulatory compliances.
- In the downstream phase, the primary clients are electricity companies and government departments that delegate construction work to the midstream providers. These clients play a pivotal role in planning and commissioning projects. In the electrical construction works industry, the relationship between midstream contractors and their downstream clients, including government departments, CLP Holdings, HK Electric, and private developers, is integral to secure new and recurring project. Besides, some electrical construction works industry players acting as subcontractors who establish sound relationship with main contractor are gain competitive advantage as well.
- In recent years and for example, Yee Hop Engineering is having HK Electric, CLP Holdings and Swire Property as their downstream client. Kum Shing Group and CLPe Solutions are having CLP Holdings as their downstream client.

Source: Frost & Sullivan

41

FROST & SULLIVAN

Overview of Hong Kong Electrical Construction Works Market

Industry Standard, Qualifications and Regulations (1/3)

Regulations	Department	Description
Approved Contractors List-Development Bureau	Development Bureau	In order to tender for public sector projects, a contractor should be accepted on the Approved Contractors List maintained by the Development Bureau. The Approved Contractors List comprises contractors who are approved for carrying out public works in one or more of the five major categories of building and civil engineering works; i.e. (1) "Buildings", (2) "Port Works", (3) "Roads and Drainage", (4) "Site Formation" and (5) "Waterworks". Although approvals granted by the Development Bureau are not subject to renewal, approved contractors are required to meet the financial, technical, management, personnel and safety criteria applicable to their respective category to maintain their status on the approved lists and for the award of public works contracts. The Development Bureau may take regulatory actions, such as removal, suspension and downgrading, against approved contractors under certain circumstances. For cable trenching, laying and joining works, some roads and drainage work is required because these activities often involve excavation and trenching on public roads and highways.
Building (Minor Works) Regulation	Buildings Department	Under the Building (Minor Works) Regulation, minor works are classified into three classes according to their nature, scale and complexity and the risk and safety they pose. Class I minor works are relatively more complicated and require higher technical experience and more stringent supervision and thus requires the appointment of a prescribed building professional (such as an authorised person who must be a registered architect, engineer and/or surveyor within the authorised persons' register maintained by the Building Authority; and where necessary, may include a registered structural engineer and/or a registered geotechnical engineer) and a prescribed registered contractor. The other two classes of minor works, Class II and Class III, can be carried out by a prescribed registered contractor (which can be a registered general building contractor, a registered specialist contractor registered under the category of demolition works/site formation works/foundation works/ground investigation field works or a registered minor works contractor) without the involvement of a prescribed building professional.
Registered Minor Works Contractor	Buildings Department	A Registered Minor Works Contractor (Company) ("RMWC (Co)") is minor works contractor who is registered under section 10(1)(b) of the Building (Minor Works) Regulation in the name of a company (including corporations, sole proprietorship and partnership) for carrying out various types and classes of minor works.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

42

Overview of Hong Kong Electrical Construction Works Market

Industry Standard, Qualifications and Regulations (2/3)

Regulations	Department	Description
Subcontractor Registration Scheme	Construction Industry Council ("CIC")	A main contractor involved in public works contracted to them involving structural works, finishing works and/or electrical and mechanical works, and supporting services under the Primary Register of the Subcontractor Registration Scheme of the Construction Industry Council shall only engage subcontractors who are registered under the Subcontractor Registration Scheme of the Construction Industry Council. Subcontractors which are involved in, among others, Electrical works (03.04) such as Electrical wiring (03.04.01), General electrical installation (03.04.02) and Electrical control and power panel assembly (03.04.03) ; and/ or general civil works (01.09); and/ or temporary electricity installations (04.06), in Hong Kong may apply for registration as a registered subcontractor under the Subcontractor Registration Scheme of the CIC. Being registered on the Subcontractor Registration Scheme at the Construction Industry Council is required for subcontractors to participate in public projects commissioned by certain Government departments and statutory bodies, including the Airport Authority, Development Bureau and the Housing Authority.
Certificate of Registration of Electrical Contractor	Electrical and Mechanical Services Department ("EMSD")	To qualify as a registered electrical contractor ("Registered Electrical Contractor registered with the EMSD under the Electricity Ordinance, a corporate applicant must employ at least one registered electrical worker registered under the Electricity Ordinance ("Registered Electrical Worker"). No contractor shall do business as an electrical contractor or carry out electrical construction works unless it is a Registered Electrical Contractor.
Construction Workers Registration Ordinance	Construction Industry Council ("CIC")	According to section 3 of the Construction Workers Registration Ordinance, a person shall not personally carry out on a construction site construction work unless the person is a registered construction worker. According to section 2 of the Construction Workers Registration Ordinance, there are five categories of construction worker registration as at the Latest Practicable Date, namely Registered skilled worker (for designated trade division), Registered skilled worker (provisional) (for designated trade division), Registered semi-skilled worker (for designated trade division), Registered semi-skilled worker (provisional) (for designated trade division), and Registered general worker

Note:

1. Bracket code denotes trade specialty code organised by the Construction Industry Council ("CIC")

Source: Frost & Sullivan

F R O S T & S U L L I V A N

43

Overview of Hong Kong Electrical Construction Works Market

Industry Standard, Qualifications and Regulations (3/3)

Standards	Department	Description
Code of Practice on Working near Electricity Supply Lines	Electrical and Mechanical Services Department ("EMSD")	The purpose of the Code is to provide practical guidance in respect of the requirements of the Electricity Supply Lines (Protection) Regulation to ensure that works carried out in the vicinity of underground electricity cables and overhead electricity lines do not prejudice safety or the continuity of the electricity supply.
Guide to Connection of Supply	Hong Kong Electric	Major references in the industry to help HK Electric's customers and electrical contractors to prepare the electrical installations for receiving electricity supply
Code of Practice 101 for Distribution Substation Design	CLP Holdings	This Code of Practice provides the details of the general principles to be applied to the design of distribution substations, which involves also standards of cable trenching, cable laying and cable joining
ISO 9001, ISO 14001, ISO 45001, and OHSAS 18001	International Organization for Standardization	ISO 9001, ISO 14001, ISO 45001, and OHSAS 18001 are international standards that provide frameworks for quality management, environmental management, and occupational health and safety management, respectively, and are applicable to electrical cable works. By adopting these standards, organizations involved in electrical cable works can demonstrate their commitment to delivering high-quality products and services, minimizing environmental impact, and providing a safe working environment for their employees.

Note:

1. Bracket code denotes trade specialty code organised by the Construction Industry Council ("CIC")

Source: Frost & Sullivan

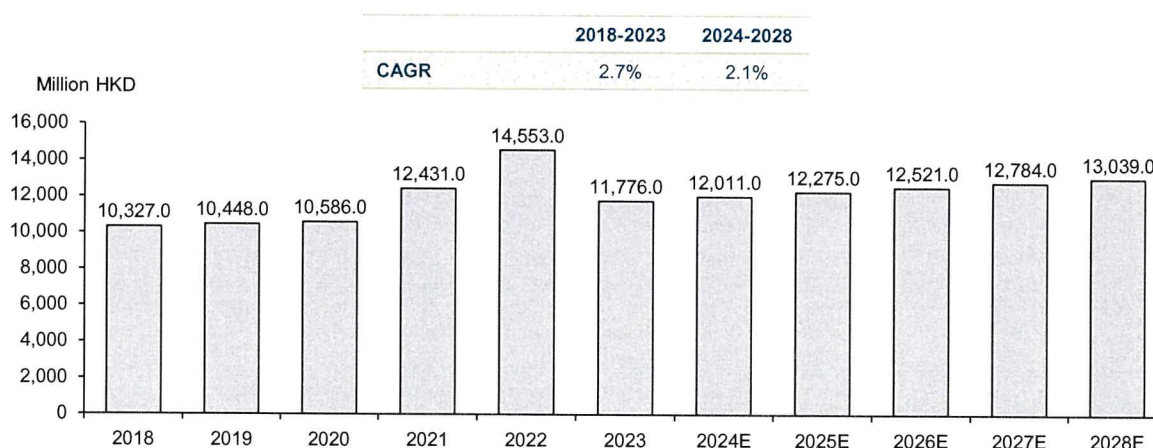
F R O S T & S U L L I V A N

44

Overview of Hong Kong Electrical Construction Works Market

Spending by CLP Holdings

CLP Holdings— Capital Expenditure, 2018-2028E



Note: Figures are extracted from Annual Report of CLP Holdings (0002.HK), breakdown of cable works in not disclosed and unavailable

Source: Annual Report of CLP Holdings, Frost & Sullivan

F R O S T & S U L L I V A N

45

Overview of Hong Kong Electrical Construction Works Market

Spending by CLP Holdings (Cont'd)

■ CLP Holdings plans to significantly increase its capital expenditure to HK\$52,900 million from 2024 to 2028, focusing on infrastructure expansion and digitalization

- Capital expenditure includes investments in physical assets such as property, plants, technology, and crucially, electrical infrastructure. Over recent years, CLP Holdings has reported a notable increase in capital expenditure, rising from HK\$10,327 million in 2018 to HK\$14,553 million in 2022, driven largely by decarbonisation efforts resulting in infrastructural work, alongside increased digitalisation such as the expansion in data centers. This rise was also supported by government approvals for additional projects, such as enhancement of the transmission and distribution networks and smart meter installation, to meet growing electricity demands particularly during 2021 and 2022. The decrease in CLP Holdings' capital expenditure from HK\$14,553 million in 2022 to HK\$11,776 million in 2023 was attributed to the completion of major projects in 2022, such as the new Combined-Cycle Gas Turbine generation unit D1 at Black Point Power Station in Hong Kong. Along with other ongoing investments in their transmission and distribution network. The higher capital expenditure in 2022 was likely driven by this significant investment and ongoing projects in transmission and distribution infrastructure.
- Looking forward to 2024-2028, CLP has planned a substantial aggregated capital expenditure of approximately HK\$52,900 million, which includes an aggregated sum during the 5 years of development works including but not limited to electrical cable, power generation facilities, substations and renewable energy projects. The projection is part of a Development Plan reviewed by the government every five years, aimed at supporting policy objectives and accommodating the city's economic growth spurred by new industries and infrastructure projects. The plan includes powering up to 18 large-scale data centers to support Hong Kong's status as a key financial and trading hub requiring reliable electricity supplies. One of the major infrastructure projects include the Urban Renewal Authority's ("URA") redevelopment initiative in Sham Shui Po commenced in September 2021 under Kim Shin Lane/Fuk Wa Street Development Project and the Cheung Wah Street/Cheung Sha Wan Road Development Scheme. These projects aim to optimize land resources, increase housing supply, and enhance the overall living conditions of residents through a holistic approach to urban renewal. As these redevelopment projects progress, they will likely drive an increased demand for electrical infrastructure upgrades and new installations in the area. CLP Holdings will play a crucial role in supporting these projects by ensuring a reliable and efficient power supply, involving the installation of new high-voltage underground cables, the replacement of aging cables, and the deployment of smart grid technologies to optimize power delivery. Other urban renewal projects may include but not limited to Nga Tsin Wai Village Project in Wong Tai Sin to be completed by 2030, and several road development scheme around Ma Tau Kok, To Kwa Wan, Hung Hom and Kowloon City.

Source: Annual Report of CLP Holdings, Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

Spending by CLP Holdings (Cont'd)

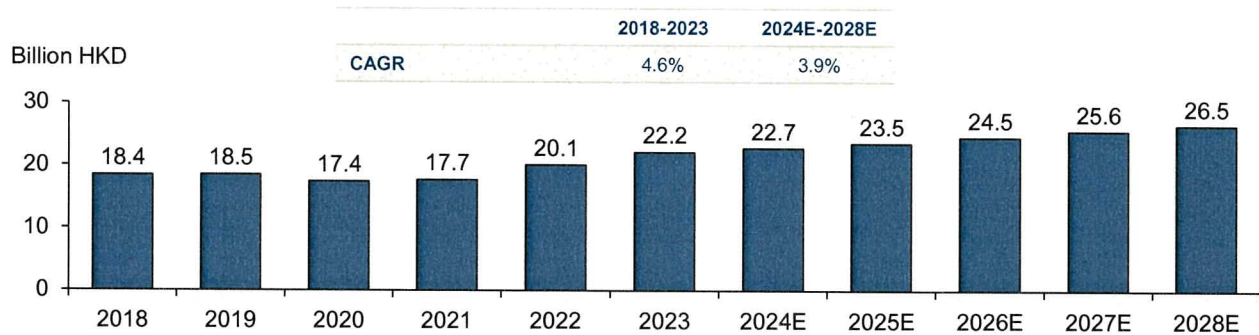
- The Northern Metropolis development will create significant opportunities for the electrical construction works sector. In particular, the San Tin Technopole focusing on technology development requires extensive electrical cable works to establish the necessary power distribution networks and data communication infrastructure for the advanced manufacturing facilities and laboratories. The development of data centers and 5G infrastructure to support the I&T industry in the Northern Metropolis will involve substantial electrical cable works to ensure reliable power supply and high-speed data transmission. Moreover, the Northern Metropolis development places a strong emphasis on sustainability and green living. The Northern Metropolis Action Agenda published in 2023 mentions that the Northern Metropolis will be a sustainable carbon-neutral community, helping Hong Kong meet the target of carbon neutrality before 2050. The focus on sustainability will drive the adoption of renewable energy systems in the development of various facilities and infrastructure. For instance, the construction of the "Northern Metropolis University Town" and the various I&T facilities will likely incorporate solar power systems, wind turbines, and other renewable energy technologies to reduce their carbon footprint. The installation and maintenance of these renewable energy systems will generate significant opportunities for the electrical construction works sector. The capital expenditures of CLP holdings is expected to rise at a CAGR of 2.1% from 2024 to 2028.

Source: Annual Report of CLP Holdings, Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

Gross Value of Overall Electrical Works Market

Gross Value of Overall Electrical Works (Hong Kong), 2018-2028E



- Electrical works encompass a wide range of activities related to low voltage and high voltage fixed electrical systems. These activities include installation, commissioning, inspection, testing, maintenance, modification, and repair, as well as the supervision and certification of the work performed. Electrical works can be further categorized into several sub-disciplines, such as electrical wiring, which involves the installation and maintenance of wiring systems within buildings and structures; general electrical installation, which includes the setup of various electrical components and systems; and electrical control and power panel assembly, which involves the installation of equipment like main low-voltage switchboards, permanent standby generators, stage lighting and AV systems, and central battery systems. The market size of overall electrical works in Hong Kong has increased from HK\$18.4 billion in 2018 to HK\$22.2 billion in 2023, representing a CAGR of approximately 4.6% during 2018 to 2023, and is projected to further climb to HK\$26.5 billion by 2028, maintaining a CAGR of around 3.9% between 2024 and 2028. The steady growth can be attributed to several factors, including the ongoing development of new residential and commercial buildings, the expansion and upgrade of existing electrical infrastructure, and the increasing adoption of smart building technologies. Additionally, the Hong Kong government's initiatives to promote energy efficiency and sustainable development are expected to drive the demand for advanced electrical systems and solutions, further contributing to the market's growth.

Source: Frost & Sullivan

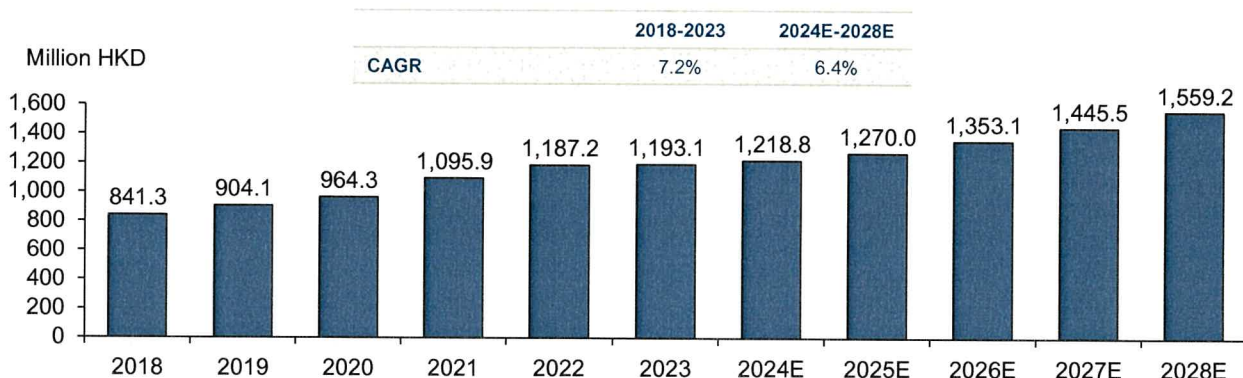
FROST & SULLIVAN

48

Overview of Hong Kong Electrical Construction Works Market

Gross Value of Power Cabling and Civil Pipeline Installation, and Solar System Construction and Maintenance

Gross Value of Power Cabling and Civil Pipeline Installation (Hong Kong), 2018-2028E



Note: Market size include only underground electricity cable works

Source: Frost & Sullivan

FROST & SULLIVAN

49

Overview of Hong Kong Electrical Construction Works Market

Gross Value of Power Cabling and Civil Pipeline Installation, and Solar System Construction and Maintenance

- The Gross Value of Power Cabling and Civil Pipeline Installation in Hong Kong has witnessed a steadily increase during past few years, with the value rising from HK\$841.3 million in 2018 to HK\$1,193.1 million in 2023, representing a CAGR of approximately 7.2% during 2018 to 2023. The growth has slowed down temporarily in 2023, due to a combination of factors including a slight reduction in capital expenditure by key market players including CLP and HK Electric, the completion of major infrastructure projects in 2022, and a temporary shift in focus towards maintaining and enhancing existing assets rather than initiating new large-scale installations in 2023. The temporary slowdown is also reflective of the cyclical nature of large infrastructure projects and ongoing economic uncertainties, which may have led to more conservative spending in the short term.
- The gross value is expected to further rise to HK\$1,559.2 million in 2028, representing a CAGR of approximately 6.4% during 2024 to 2028. The growth is mainly attributable to the rollout of extensive electricity infrastructure development projects including the "CLP Power 2024 – 2028 Development Plan and 2024 Tariffs" published in November 2023 and "HK Electric 2024 - 2028 Development Plan & 2024 Tariff Review" published in November 2023, supporting the development of new areas, data centers, district cooling systems, railway projects, and hospital expansions, in new town development which all requires extensive cable laying and joining work. In particular, CLP's substantial planned aggregated capital expenditure of approximately HK\$52,900 million for 2024-2028 is a key factor underpinning this growth. This investment encompasses a variety of development works, including electrical cable installations, power generation facilities, substations, and renewable energy projects. Further, urban renewal projects are expected to be significant drivers of demand. For instance, the URA's redevelopment initiatives under Kim Shin Lane/Fuk Wa Street Development Project and the Cheung Wah Street/Cheung Sha Wan Road Development Scheme in Sham Shui Po, as well as Nga Tsin Wai Village Project in Wong Tai Sin to be completed by 2030, and several road development scheme around Ma Tau Kok, To Kwa Wan, Hung Hom and Kowloon City, will collectively necessitate extensive electrical infrastructure upgrades and new installations. These projects will involve the deployment of new high-voltage underground cables, replacement of aging cables, and implementation of smart grid technologies. The Northern Metropolis in particular, presents substantial opportunities for the sector, particularly in the San Tin Technopole area which requires extensive electrical cable works for power distribution networks and data communication infrastructure to support advanced manufacturing facilities and laboratories. While CLP's capital expenditures as disclosed in annual report and according to industry experts had risen at a CAGR of around 2.7% during 2018 to 2023 and is expected to rise at a CAGR of approximately 2.1% from 2024 to 2028, the projected CAGR of gross value of power cabling and civil pipeline installation shall follow similarly based on anticipated market conditions, growing at a similarly slightly lower CAGR of 6.4% during 2024 to 2028.

Source: Frost & Sullivan

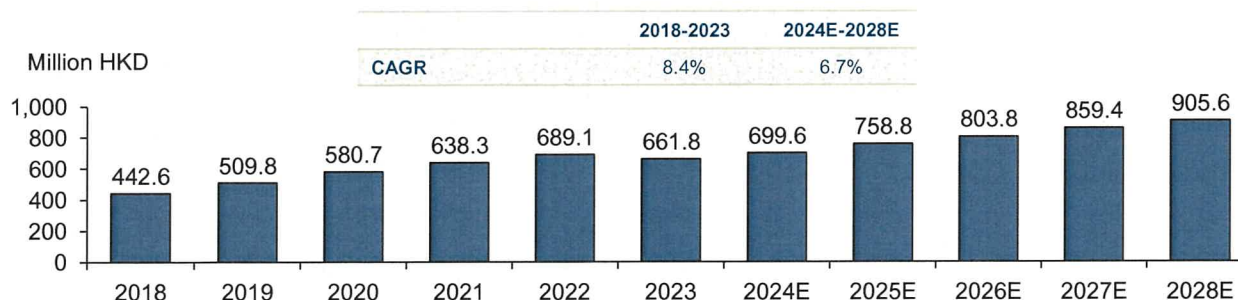
F R O S T & S U L L I V A N

50

Overview of Hong Kong Electrical Construction Works Market

Gross Value of Power Cabling and Civil Pipeline Installation, and Solar System Construction and Maintenance

Gross Value of Solar System Construction and Maintenance (Hong Kong), 2018-2028E



Note: Market size include only solar system installation and maintenance

Source: Frost & Sullivan

F R O S T & S U L L I V A N

51

Overview of Hong Kong Electrical Construction Works Market

Gross Value of Power Cabling and Civil Pipeline Installation, and Solar System Construction and Maintenance

- The Gross Value of Solar System Construction and Maintenance in Hong Kong has witnessed a steady increase during past few years, with the value rising from HK\$442.6 million in 2018 to HK\$661.8 million in 2023, representing a CAGR of approximately 8.4% during 2018 to 2023. The slight decline in 2023 was primarily due to adjustments in the Feed-in Tariff (FiT) scheme. As announced by the government in April 2022, the FiT rates were reduced from the previous range of \$3 to \$5 per kilowatt hour to a new structure of \$2.5 to \$4 per kilowatt hour, depending on the generating capacity, serving as the contributing factor to a temporary slowdown in new installations.
- The gross value is expected to further rise to HK\$935.6 million in 2028, representing a CAGR of approximately 6.7% during 2024 to 2028. The continuous growth projection is supported by several key factors. Firstly, the Hong Kong government's 2024-25 budget has introduced a "Building-Integrated Photovoltaics Pilot Scheme," starting with the Electrical and Mechanical Services Department Headquarters, which aims to explore and promote the application of solar energy technology in government building facades, setting a precedent for wider adoption in both public and private sectors, potentially boosting demand for solar installations. Further, the trend towards mandatory ESG disclosures, such as the Hong Kong Stock Exchange's requirement for all listed companies to disclose climate-related information in their ESG reports by 2025, is expected to drive corporate investment in renewable energy solutions, which can spur the demand of businesses investing in solar energy systems to improve their environmental performance. Besides, the Environmental Affairs Committee's 2024 demonstrated plans for large-scale floating solar panel systems in various locations such as Plover Cove Reservoir and a major solar power system in the Southeast New Territories Landfill, demonstrating the local solar industry and create new opportunities for construction and maintenance services. Additionally, as the impact of the 2022 FiT rate reduction is expected to normalize, coupled with ongoing technological advancements improving the efficiency and cost-effectiveness of solar panels, the industry is poised for steady growth. The continued adoption of building-integrated photovoltaics (BIPV) in new constructions, the prevalence of Renewable Energy Certificate (REC) Scheme, driven by Hong Kong's dense urban environment, further contributes to this positive outlook. These factors collectively support the projected CAGR of 6.7% for the period 2024 to 2028, indicating a robust and sustainable growth trajectory for the solar system construction and maintenance industry in Hong Kong.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

52

Overview of Hong Kong Electrical Construction Works Market

Market Drivers (1/4)

Electrical Cable Works (Cable Trenching, Laying and Joining)

Infrastructure
Development Projects
of Major Electricity
Corporates

Hong Kong's ongoing commitment to upgrading and expanding its power transmission infrastructure is a significant driver of the cable laying, trenching, and joining industry. In 2023, CLP Holdings launched the CLP Power 2024 – 2028 Development Plan, which outlines a substantial investment of \$52.9 billion, which includes an aggregated sum during the 5 years of development works including but not limited to electrical cable, power generation facilities, substations and renewable energy projects, to deliver on the Government's policy priorities. Such plan is set to create numerous opportunities for cable construction companies as CLP Power works to meet the needs of new development areas, support housing growth, and power Hong Kong's economic growth and new industries. Particularly, CLP Power will be supporting the development of the Northern Metropolis and accelerated housing supplies, as well as supporting the development of data centers, district cooling systems, new railway projects, hospital re-development and expansion, and other infrastructure, which are all requiring extensive cable laying and joining work. Similarly, HK Electric has also announced its 2024-2028 Development Plan, which outlines a \$22 billion investment to address climate challenges and sustain decarbonization efforts. The plan includes building new generating units, strengthening the power grid, upgrading the voltage of the distribution system, deploying smart meters, and enhancing system resilience against extreme weather events. These projects will involve substantial cable laying, trenching, and joining work, as well as specialized services to support grid intelligence and automation.

Expedite New Town
Developments

The Hong Kong government's commitment to new town development projects, as outlined in the Policy Address 2023, is a significant driver of demand for electrical cable works. The Civil Engineering and Development Department is overseeing projects such as the Hung Shui Kiu/Ha Tsuen New Development Area, Northern Metropolis, and Kau Yi Chau Artificial Island under the Lantau Tomorrow Vision. These developments will require extensive cable laying, trenching, and joining services to support power supply, communication systems, and smart city initiatives. The government's focus on infrastructure modernization and integration with the Greater Bay Area further bolsters the growth of the cable construction industry, ensuring a strong pipeline of opportunities in the coming years.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

53

Overview of Hong Kong Electrical Construction Works Market

Market Drivers (2/4)

Electrical Cable Works (Cable Trenching, Laying and Joining)

Replacement and Maintenance of Aging Underground Cable Infrastructure

Hong Kong has been grappling with issues related to aging electrical infrastructure, particularly concerning power cables. The recent series of power outages in Hong Kong, particularly in densely populated areas, highlights the pressing need for infrastructure upgrades in the city's electrical grid. Notable incidents include high-voltage cable failure affected hundreds of users in Tsing Yi in 2024, abrupt blackout in Wong Tai Sin which affected more than two thousands users due to a faulty cable in 2024, as well as power outage causing electricity malfunctioning across Sham Shui Po in 2022. These incidents underscore the urgent need for comprehensive cable replacement and system upgrades across Hong Kong's older districts. As the city's power grid continues to age, utility companies including CLP Holdings and HK Electric are expected to increase capital expenditure to improve grid reliability and minimise outages. Urban Renewal Authority's ("URA") redevelopment initiative in Sham Shui Po commenced in September 2021 under Kim Shin Lane/ Fuk Wa Street Development Project and the Cheung Wah Street/Cheung Sha Wan Road Development Scheme, coupled with and various road development schemes in Kowloon will require substantial electrical infrastructure improvements, which present significant opportunity for electrical cable works companies to participate in power grid modernization projects.

Source: Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

Market Drivers (3/4)

Solar System Construction and Maintenance

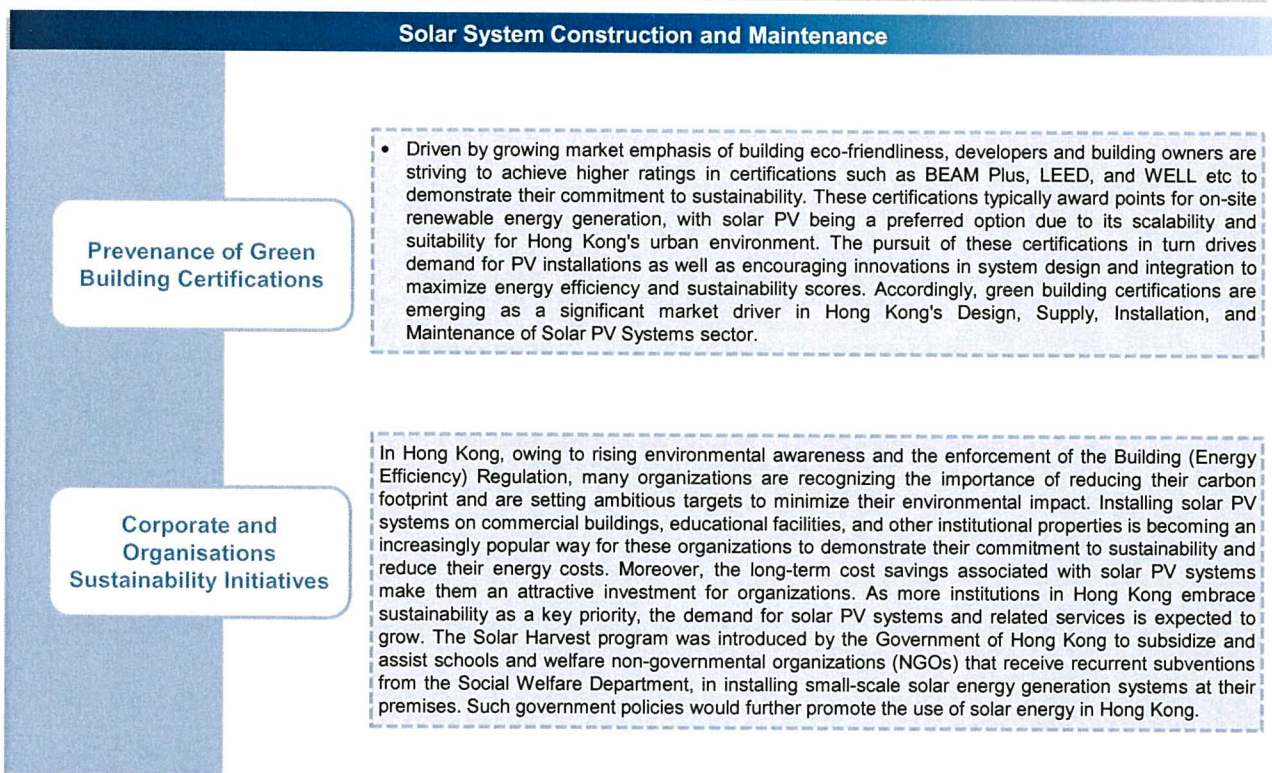
Supportive Government Initiatives

In line with Hong Kong's Climate Action Plan 2050, the government aims to increase the share of renewable energy in the fuel mix for electricity generation to 7.5% to 10% by 2035 and 15% by 2050, despite geographical and environmental constraints. To achieve these goals, the government offers incentives such as the Feed-in Tariff (FIT) Scheme, allowing businesses and households to sell electricity generated by their solar PV systems to the grid at a preferential rate, and the Renewable Energy Certificate (REC) Scheme, enabling companies and individuals to purchase RECs to demonstrate their commitment to sustainability. The Feed-in Tariff (FIT) scheme is an initiative of the Hong Kong Government to promote the development of renewable energy under the Scheme of Control Agreements, which were signed between the Hong Kong Government and the respective two power companies in April 2017. Under the FIT scheme, people who install solar or wind energy generation systems at their premises can sell the renewable energy they generate to the power companies at a rate higher than the normal electricity tariff rate. The FIT scheme will help encourage the private sector to consider investing in renewable energy as the power generated could be sold to the power companies at a rate higher than the normal electricity tariff rate to help recover the costs of investment in the renewable energy systems and generation. In particular, any non-governmental bodies or individuals, who plan to install distributed renewable energy systems at their premises in the respective power company's supply area with a generating capacity of up to 1 megawatt (MW) are eligible for prescribed FIT rates as long as they have been connected to the relevant power company's grid. In turn, the supportive government policies would translate into growth opportunities for the solar system construction and maintenance works in Hong Kong. The FIT scheme provides economic incentives to Hong Kong businesses, institutions and households to install solar PV systems, thereby driving the demand for solar PV systems in Hong Kong in which the Group's PV solar systems business can benefit from. These policies have driven demand for companies specializing in the design, supply, installation, and maintenance of solar PV systems, with FIT scheme applications increasing from 60 in 2018 to over 18,000 in 2021. As a result, solar energy among renewable energy sources significantly increased from 47 Ti in 2018 to 432 Ti in 2021, mainly due to the FIT scheme. As of the year end of 2023, more than 2,000 solar energy projects have been completed under the FIT scheme. By the end of June 2024, the amount of generation capacity approved under the FIT scheme reached 391kWh, equivalent to the annual electricity consumption of 96,500 households, up from 356 kWh by the end of June 2023 and 309 kWh by the end of June 2022, representing the annual growth rate of 9.8% in 2024 and 15.2% in 2023. The ongoing rise in the amount of generation capacity approved under the FIT scheme and participation in the FIT Scheme reflects a positive trend toward renewable energy adoption in Hong Kong, driven by awareness, incentives, and supportive policies. This momentum is crucial for achieving long-term sustainability and energy goals.

Source: Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

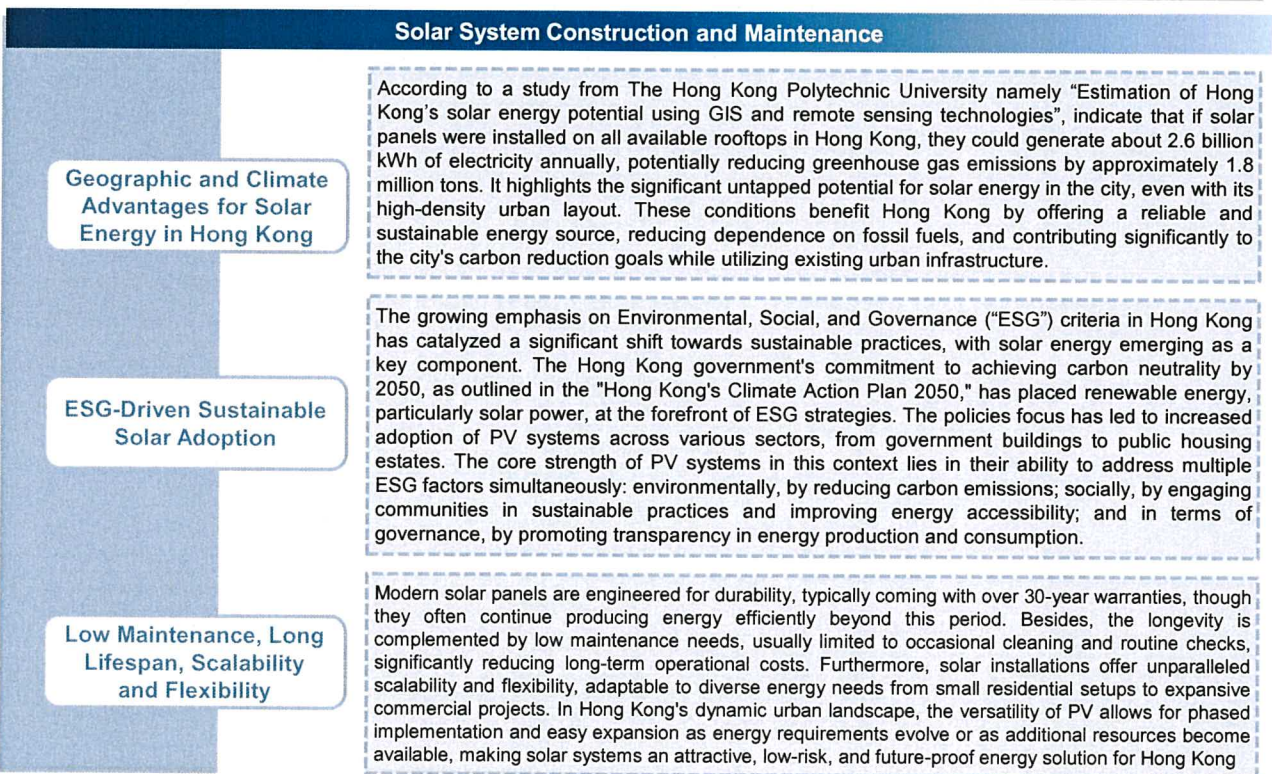
Market Drivers (3/4)



Source: Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

Core Strengths of Solar System Construction and Maintenance



Source: Frost & Sullivan

Overview of Hong Kong Electrical Construction Works Market

Development Trend and Opportunities

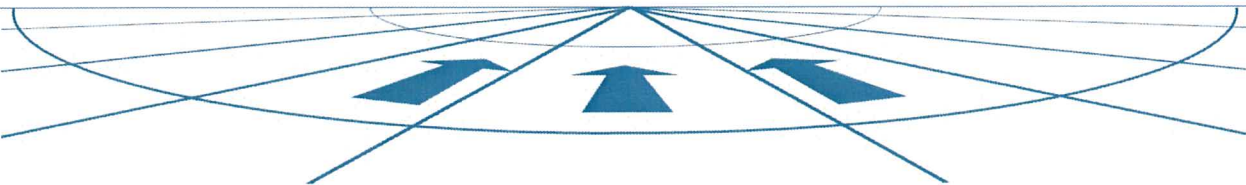
Electrical Cable Works (Cable Trenching, Laying and Joining)

Adoption of Smart Grid Technologies in Electricity Supply

The adoption of smart grid technologies in Hong Kong is driving significant demand for underground electricity cable works, as the transition to a more intelligent, efficient, and sustainable power network requires substantial upgrades and expansions to the existing infrastructure. The deployment of smart meters, integration of renewable energy sources, implementation of advanced automation systems, and expansion of electric vehicle charging infrastructure all necessitate extensive underground electricity cable installations, trenching, and maintenance services. As major electricity companies like CLP Power continue to invest in smart grid technologies to improve energy efficiency, reliability, and sustainability, the demand for underground electricity cable works will remain strong, presenting substantial opportunities for companies specializing in this field and playing a critical role in realizing Hong Kong's smart grid ambitions.

Technological Advancement in Electrical Cable Works

Technological advancements are driving market trends in Hong Kong's underground electricity cable works industry. The adoption of high-temperature superconducting cables enables the transmission of larger amounts of electricity in a smaller footprint, reducing environmental impact. The use of robotics and automation in cable installation and maintenance processes improves efficiency, safety, and precision while reducing costs and project timelines. Smart sensors and monitoring technologies enhance the reliability and longevity of the power network. As Hong Kong prioritizes innovation and sustainability in its energy infrastructure, the adoption of these technological advancements will remain a key market trend, driving demand for specialized skills and services in the underground electricity cable works industry.



Source: Frost & Sullivan

F R O S T S U L L I V A N

58

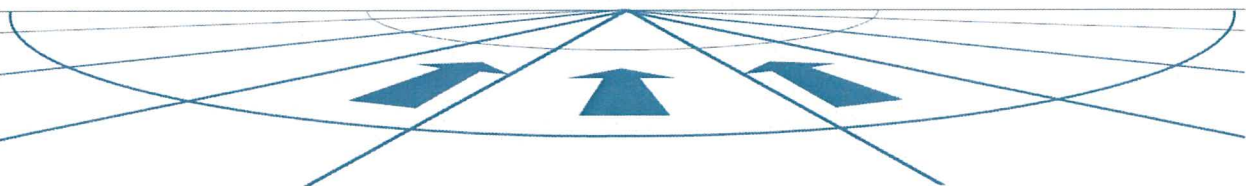
Overview of Hong Kong Electrical Construction Works Market

Development Trend and Opportunities

Electrical Cable Works (Cable Trenching, Laying and Joining)

Adoption of Common Utility Tunnels ("CUTs")

The adoption of Underground Utility Tunnels, specifically Common Utility Tunnels ("CUTs"), is emerging as a market trend. CUTs are underground passages designed to house multiple utility services, including electrical cables, in a shared space. This approach, exemplified by the Tung Chung New Town Extension project's 1.7km CUT, is reshaping the landscape for cable installation and maintenance. The government's push for CUTs in new development areas is creating opportunities for high voltage cable installations in these shared underground spaces. It requires electrical contractors to develop specialized techniques for laying and maintaining cables in confined, multi-utility environments, driving demand for expertise in this specialized field and transforming traditional cable trenching and laying practices.



Source: Frost & Sullivan

F R O S T S U L L I V A N

59

Overview of Hong Kong Electrical Construction Works Market

Development Trend and Opportunities

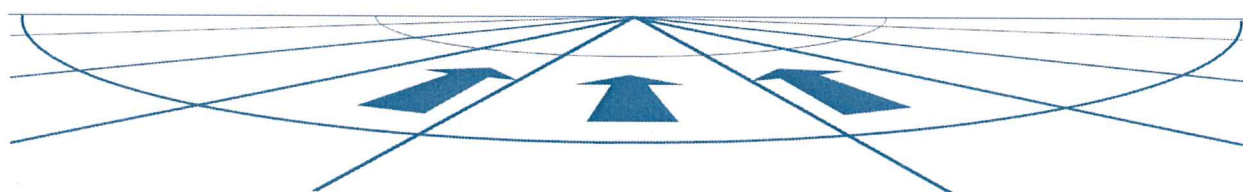
Solar System Construction and Maintenance

Cost of Solar PV Systems is diminishing

In recent years, the prices of solar PV panels and related components have fallen constantly, attributable to advancements in manufacturing processes, increased production scale, and intense competition among suppliers, making solar PV systems more affordable and cost-competitive with traditional energy sources. In turn, the lower upfront costs and shorter payback periods associated with solar PV installations have made them an attractive investment option, driving demand for design, supply, installation, and maintenance services in the city. As the cost of solar PV technology is expected to continue declining in the future, this market trend will likely persist, creating significant opportunities for companies operating in the solar PV sector to capitalize on the growing demand for affordable and sustainable energy solutions in Hong Kong.

Technological Advancement in Solar PV Systems

Technological advancements in the solar PV industry are driving significant improvements in the performance, efficiency, and attractiveness of solar PV systems. For instance, the introduction of higher efficiency solar PV panels, which can convert a greater portion of the sun's energy into electricity compared to earlier generations of panels. Moreover, the integration of smart monitoring systems and data analytics tools allows for real-time performance tracking, fault detection, and predictive maintenance, enhancing the reliability and optimizing the performance of solar PV installations. Another significant technological advancement is the development of energy storage solutions, such as high-capacity batteries, which enable the storage of excess solar energy generated during the day for use during periods of low or no sunlight.



Source: Frost & Sullivan

F R O S T & S U L L I V A N

60

Overview of Hong Kong Electrical Construction Works Market

Threats and Challenges

Electrical Cable Works (Cable Trenching, Laying and Joining)

Rising Labour Cost

Rising labor costs present a significant market challenge for underground electricity cable works companies in Hong Kong. The industry relies heavily on skilled professionals, such as electrical fitters, cable jointers (power), and plant & equipment operators (load shifting), and the average daily wages of these occupations experienced a steady increase over the past five years, attributed to factors such as the limited supply of qualified workers, the increasing complexity of underground electricity cable works projects, and the overall inflation in Hong Kong. As labor costs constitute a substantial portion of the total project costs, the continued increase in wages puts pressure on the profit margins of underground electricity cable works companies and solar PV panel installation companies.

Shortage of Labour

The implementation of electrical cable works require skilled technicians and specialized equipment to ensure proper installation and long-term reliability, as well as to verify the integrity and performance of the installed cables before energisation. The sustained challenge of shortage of labour in the Hong Kong civil works and electrical and mechanical works market poses constraints to the electrical cable works market in Hong Kong.

Technical Challenges

One critical challenge is the design of optimal cable routes in the city's congested underground space, which requires extensive knowledge of existing utility networks and the use of advanced surveying and mapping technologies, such as ground-penetrating radar and 3D utility mapping software. Another significant challenge is the selection and installation of suitable cable types and accessories, taking into account factors such as power capacity, voltage level, insulation properties, and environmental conditions, while adhering to stringent industry standards.

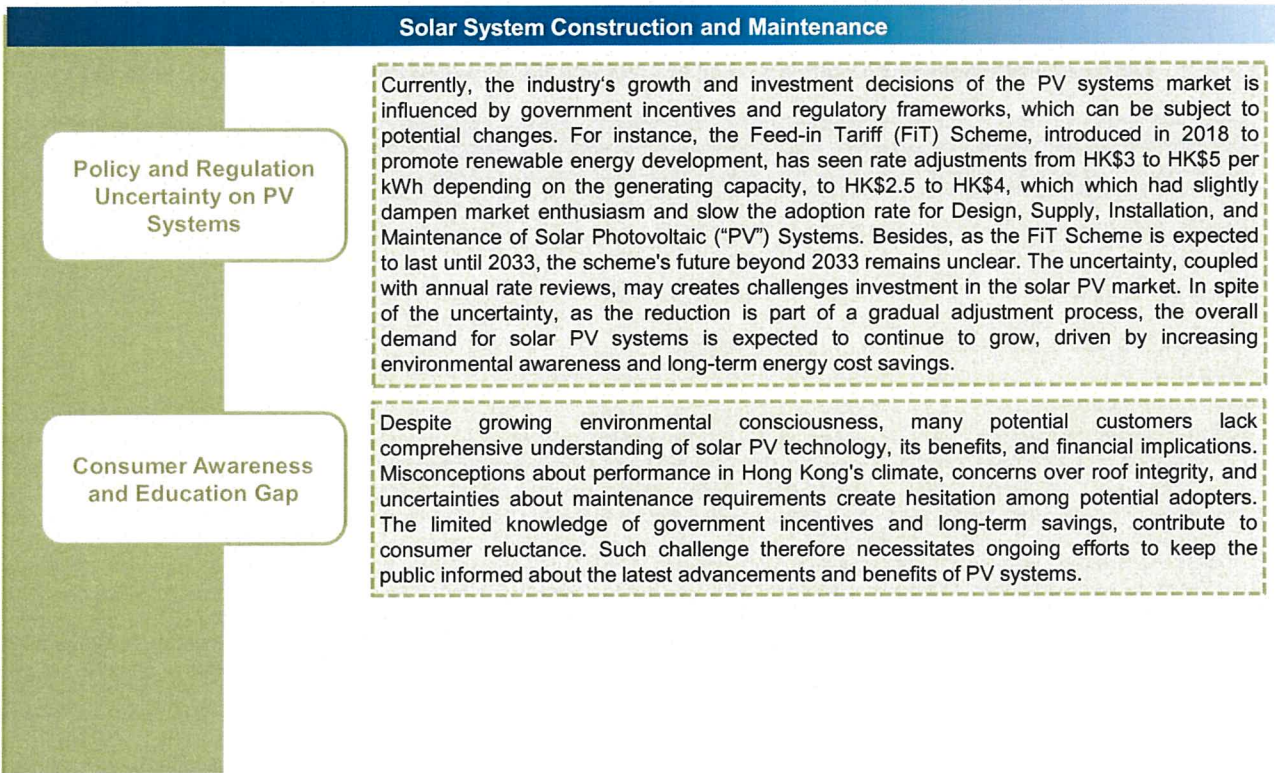
Source: Frost & Sullivan

F R O S T & S U L L I V A N

61

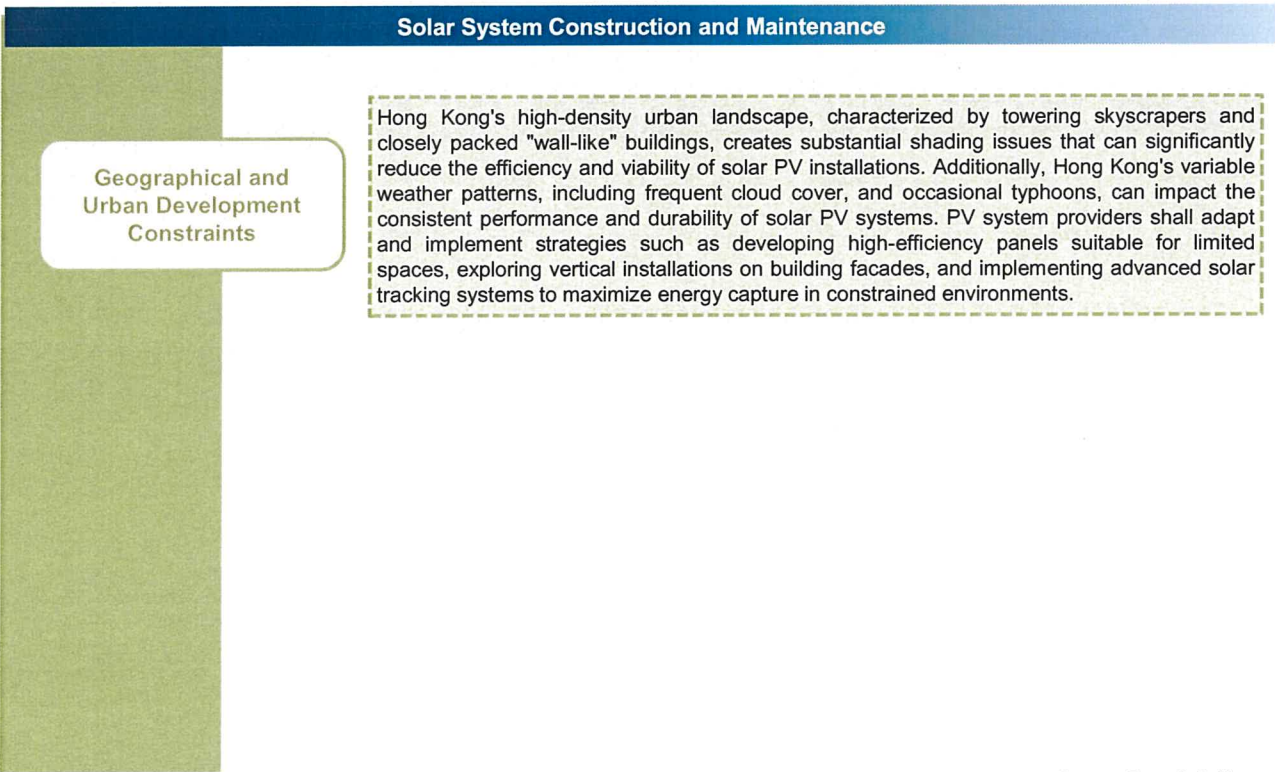
Overview of Hong Kong Electrical Construction Works Market

Threats and Challenges



Overview of Hong Kong Electrical Construction Works Market

Threats and Challenges



Overview of Hong Kong Electrical Construction Works Market

Cost Analysis – Labour Cost

Average Daily Wages of Workers Engaged in Electrical Construction Works (Hong Kong), 2018-2023

HK\$	2018	2019	2020	2021	2022	2023	CAGR (2018-2023)	CAGR (2024E-2028E)
Electrical fitter (incl. electrician)	1,236.6	1,207.3	1,247.4	1,234.9	1,255.3	1,309.5	1.2%	1.0%
Cable joiner (power)	1,119.4	1,393.1	1,330.8	1,202.3	1,327.2	1,226.7	1.8%	1.6%
Plant & equipment operator (load shifting)	1,241.8	1,221.0	1,222.0	1,237.6	1,282.9	1,303.0	1.0%	0.8%

- The average daily wages of workers engaged in electrical construction works such as cable trenching, laying and joining, and installation of solar panels in Hong Kong have demonstrated a positive trend between 2018 and 2023. All three key occupations including electrical fitters (including electricians), cable joiners (power), and plant & equipment operators (load shifting) are involved in cable trenching, laying and joining, while electrical fitters (including electricians) are crucial type of labour for connecting the solar panels to the electrical system of buildings. These labour types have all experienced a steady increase in their average daily wages over the five-year period, recording CAGRs of approximately 1.2%, 1.8% and 1.0% respectively. Cable joiners (power) witnessed the most significant growth. The upward trend in wages reflects the growing demand for skilled workers in the electrical construction works sector and the recognition of their expertise and contribution to the industry.
- With the increasing demand for electrical construction works and solar system construction and maintenance, the average daily wages of workers engaged in electrical construction works and solar system construction and maintenance in Hong Kong are expected to record positive growth from 2024 to 2028.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

F R O S T & S U L L I V A N

64

Overview of Hong Kong Electrical Construction Works Market

Cost Analysis – Raw Material Cost

Average Wholesale Prices of Selected Raw Material of Electrical Construction Works (Hong Kong), 2018-2023

HK\$	Unit	2018	2019	2020	2021	2022	2023	CAGR (2018-2023)
uPVC pipes	No.	52.0	53.0	53.0	55.0	59.0	62.0	3.6%
GMS ("Galvanized Mild Steel") pipes	No.	1,063.8	1,058.5	1,046.9	1,139.0	1,176.0	1,112.0	0.9%

Price Index of Raw Material of Solar System Construction and Maintenance Works (Hong Kong), 2018-2023

HK\$	Unit	2018	2019	2020	2021	2022	2023	CAGR (2018-2023)
Solar Photovoltaic Module Price	2018=100	100.0	91.5	72.3	55.3	55.3	38.3	-17.5%

- Besides, the price index of solar photovoltaic module has experienced a dramatic decline from 100.0 in 2018 to 38.3 in 2023, representing a CAGR of approximately 17.5% during the past five years. The significant reduction in raw material costs aligns with global trends in solar photovoltaic module prices and can be attributed to technological advancements and economies of scale, especially due to China's continuous and rapid expansion of manufacturing capacity of solar photovoltaic module resulting in abundant supply and lowering price. For Hong Kong, the decline has made solar systems more affordable and accessible to a wider range of consumers and businesses, potentially improving return on investment for solar projects, and likely stimulating growth in the local solar industry. The trend underscores the improving economic viability of solar energy g, which could play a crucial role in the city's transition to renewable energy sources and its efforts to meet climate goals.

Source: International Renewable Energy Agency, Census and Statistics Department of Hong Kong, Trade Map, Frost & Sullivan

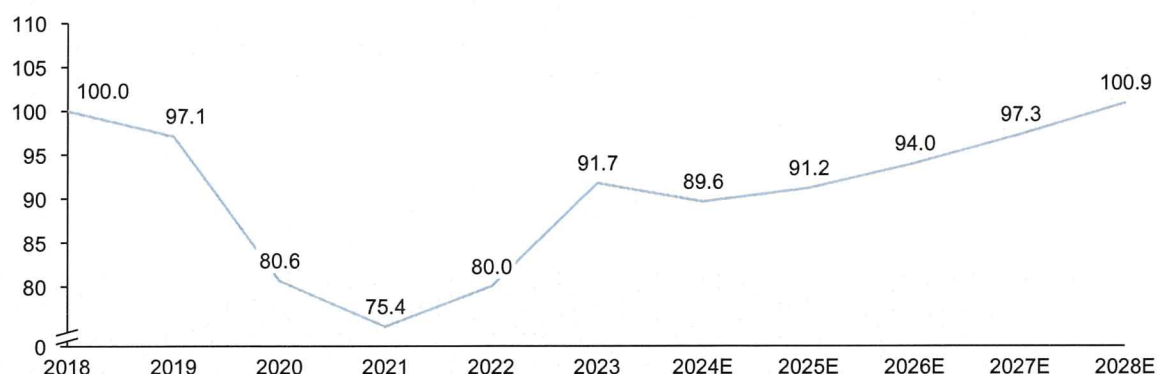
F R O S T & S U L L I V A N

65

Overview of Hong Kong Electrical Construction Works Market

Cost Analysis – Producer Price Index of Rental of Machinery and Equipment

Producer Price Index of Rental of Machinery and Equipment (Hong Kong), 2018-2028E



- The Producer Price Index ("PPI") for Rental of Machinery and Equipment in Hong Kong is a measure that tracks changes in the prices from a base of 100.0 in 2018 to 91.7 in 2023, largely due to COVID-19 disruptions which dampened construction activities charged by companies for renting out construction and industrial equipment. The PPI for Rental of Machinery and Equipment in Hong Kong has shown fluctuations in recent years, decreasing and equipment demand. Driven by the recovery from the outbreak of the COVID-19, various major infrastructure initiatives such as the Northern Metropolis development, Kwun Tung North and Fanling North New Development Areas, and the Lantau Tomorrow Vision, as well as the government's commitment to increasing annual capital works expenditure, the prospects for equipment rental services is expected to improve, with the PPI for Rental of Machinery and Equipment gradually recover to 100.9 by 2028.

Source: Census and Statistics Department of Hong Kong, Frost & Sullivan

FROST & SULLIVAN

66

Agenda

- 1 Introduction of the Research
- 2 Overview of Macro Economy in Hong Kong
- 3 Overview of Hong Kong Civil Engineering Market
- 4 Overview of Hong Kong Electrical Construction Works Market
- 5 **Competitive Landscape of Hong Kong Civil Engineering Market**
- 5 Competitive Landscape of Hong Kong Electrical Construction Works Market

FROST & SULLIVAN

67

Competitive Landscape of Hong Kong Civil Engineering Market

Overview of Market Competition

- The civil engineering market in Hong Kong is relatively concentrated. According to the Construction Industry Council, as of April 2024, there were 1,584 registered structural and civil engineering subcontractors in Hong Kong. Among which, there were approximately 327 contractors were on the List of Approved Contractors for Public Works of Development Bureau as of April 2024, including 169 companies for roads and drainage works and 95 companies for site formation works. Contractors in the list are eligible to tender for public works contracts only in the works categories and groups for which they are approved.

Number of Approved Contractors for Roads and Drainage Works and Site Formation Works in Hong Kong (April 2024)

Group	Contract value of public works for tendering	Number of contractors in roads and drainage works	Number of contractors in site formation works
A	Contracts of value up to HKD150 million	40	0
B	Contracts of value up to HKD400 million	67	59
C	Contracts of any values exceeding HKD400 million	62	36

Source: Development Bureau, Construction Industry Council, Frost & Sullivan

F R O S T & S U L L I V A N

68

Competitive Landscape of Hong Kong Civil Engineering Market

Ranking and Market Shares

- As estimated, the aggregate market share of top three market participants in civil engineering works market in Hong Kong in 2023 was approximately 22.4%. The Group recorded the revenue of HKD363.6 million, accounting for a market share of approximately 0.6% in the overall civil engineering works market in Hong Kong in 2023..

Ranking and Market Share of Leading Civil Engineering Works Contractor in Hong Kong by Revenue, 2023

Rank	Market participant	Headquarter	Listed	Background	Estimated revenue in 2023 (HKD billion)	Estimated market share in 2023 (%)
1	Build King Holdings Ltd.	Hong Kong	Yes	The subsidiary of a Hong Kong-based construction group listed on the Hong Kong Stock Exchange, with a focus on civil engineering	7,186.0	12.4%
2	Bouygues Travaux Public	France	No	A subsidiary of a French industrial group listed on the Euronext Paris exchange, specializing in civil engineering, real estate development, media, telecommunications services	3,428.9	5.9%
3	China Road and Bridge Corporation	The PRC	No	A wholly-owned subsidiary of an infrastructure development group listed on the Hong Kong Stock Exchange	2,333.2	4.0%
N/A	The Group				363.6	0.6%

Source: The ranking is based on the revenues for the year ended 31 March 2024.

F R O S T & S U L L I V A N

Source: Development Bureau, Construction Industry Council, Frost & Sullivan

69

Competitive Landscape of Hong Kong Civil Engineering Market

Factors of Market Competition

Recognition and qualification

Qualification serves as a key factor of competition in the industry. In particular, the Development Bureau publishes and regularly updates the List of Approved Contractors for Public Works and details of registered contractors, including works categories and contract value of public works for tendering, are accessible to the public and potential clients. Furthermore, civil engineering works contractors obtaining certain widely recognised certificates including ISO9001, ISO45001 and ISO14001 in the area of quality system management, occupational health and environmental management are more competitive in the market.

Track record and quality of works

In general, civil engineering cover various infrastructure and facilities such as roads and drainage and contractors are required to deliver the high quality of works within the timeframe and budget. Any failure in construction works may potentially lead to damage of existing facilities or utilities such as bursting pipes and defect in subsequent construction works caused by poor foundations and site formation works. In addition, clients of civil engineering works (e.g. Hong Kong Government) would evaluate contractors in different aspects such as quality of works, timeliness of project delivery as well as capability of meeting safety and environmental requirements as part of assessment criteria for tender awards.

Relationship with stakeholders

Established civil engineering works contractors generally maintain a good relationship with various stakeholders, including engineering consultants, sub-contractors and raw materials suppliers. In particular, civil engineering works contractors are often required to provide design-and-build services from preparation of engineering designs, allocation of resources, project management and execution for certain infrastructure development projects and external consultants with sufficient professional engineers are often engaged. Furthermore, subcontractors are usually appointed by main contractors in sizeable civil engineering works and established relationship with key subcontractors serve as a competitive edge for main contractors to deliver high quality of works.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

70

Competitive Landscape of Hong Kong Civil Engineering Market

Entry Barriers Analysis of Civil Engineering and Electrical Construction Works

Registration requirement

Civil engineering and electrical construction works contractors are required to demonstrate expertise and proven track record in undertaking relevant projects. In particular, portfolio and cumulative contract value of civil engineering and electrical construction works projects are key requirements for registration and categorization of contractors based on their capabilities and scale of operation in respective works categories, namely port works, roads and drainage works, and site formation works. In addition, strong track record is required for advancement of registered contractors to higher level of work group with eligibility of tendering for civil engineering and electrical construction works projects of higher contract value. Hence, new entrants without proven track record are hindered from undertaking sizeable projects.

Capital requirement

High capital investment is one of the key barriers for new entrants. Sufficient capital is generally required for purchase of a wide variety of specialised machinery such as excavators, dozers, scrapers, drum rollers, loaders, asphalt distributors and graders for relevant civil engineering works, on top of other key cost items such as procurement and labour cost. Furthermore, contractors are required to have sufficient initial capital reserve during the early stage of construction works in view of the fact that payment is generally settled according to the progress of construction works. Maintaining a sufficient cash flow is also a key criterion for contractors to tender and undertake sizeable civil engineering and electrical construction works projects from the Government.

Technical expertise and project experience

Civil engineering and electrical construction works are considered as a specialised engineering area which requires extensive knowledge in geology and structural engineering which are essential for planning, environmental impact analysis, design and construction of structures. In addition, solid experience in project management and execution is considered pre-requisite for civil engineering and electrical construction works in on-site environment.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

71

Agenda

1	Introduction of the Research
2	Overview of Macro Economy in Hong Kong
3	Overview of Hong Kong Civil Engineering Market
4	Overview of Hong Kong Electrical Construction Works Market
5	Competitive Landscape of Hong Kong Civil Engineering Market
5	Competitive Landscape of Hong Kong Electrical Construction Works Market

Competitive Landscape of Hong Kong Electrical Construction Works Market

Competition Overview

- The electrical construction works in Hong Kong is relatively fragmented. According to Construction Industry Council ("CIC"), there were approximately 1,778 subcontractors on the List of Registered Subcontractors under the trade code of Electrical of CIC as of April 2024. Among the registered contractors, it is estimated that there were approximately 600 market participants in the power cabling & civil pipeline installation market in Hong Kong in 2023. The Group is the largest power cabling & civil pipeline installation subcontractor in Hong Kong in 2023 with the market share of 13.6%.

Ranking and Market Share of Leading Power Cabling & Civil Pipeline Installation Subcontractor in Hong Kong by Revenue, 2023

Rank	Market participant	Headquarter	Listed	Background	Estimated revenue in 2023 (HKD billion)	Estimated market share in 2023 (%)
1	The Group	Hong Kong	No	NA	113.2	13.6%
2	Yat Cheong Civil Engineering Company Limited	Hong Kong	No	A sub-contractor engaged in civil engineering works and electrical works	60.0	7.2%
3	Wang Yu Engineering Company Limited	Hong Kong	No	A contractors specializing in public road excavation and cable laying works in Hong Kong	45.0	5.4%

Note: The ranking is based on the revenues for the year ended 31 March 2024.

Competitive Landscape of Hong Kong Electrical Construction Works Market

Ranking and Market Shares

- The solar system construction and maintenance in Hong Kong is relatively fragmented and there were approximately 300 market participants in the solar system construction and maintenance market in Hong Kong in 2023. The Group recorded the revenue of HKD44.3 million in solar system construction and maintenance in Hong Kong in 2023, with the market share of 6.6%. The solar system construction and maintenance market is competitive with the market participants focusing on different customers group in Hong Kong, namely government institutions, public housings, schools, village houses and other buildings. In particular, the project scale of government institutions, public housings, schools tend to be greater than village houses and other buildings. Companies that demonstrate superior technical and project execution capabilities are more likely to bid large scale projects and succeed in this market in Hong Kong. The supportive government policies and rising adoption of solar energy have translated into growth opportunities for solar system construction and maintenance in Hong Kong.

Ranking and Market Share of Leading Solar System Construction and Maintenance Works Contractor in Hong Kong by Revenue, 2023

Rank	Market participant	Headquarter	Listed	Background	Estimated revenue in 2023 (HKD million)	Estimated market share in 2023 (%)
1	Amosola Limited	Hong Kong	No	A solar power solutions provider in Hong Kong, engaged in solar system construction and maintenance, and distribution of solar panels. The services scope includes testing, commissioning, design, installation and maintenance of solar system.	95.0	14.1%
2	EcoSmart Solar Engineering Limited	Hong Kong	No	It is a solar power solutions company in Hong Kong and provides solar engineering and energy management services, from investment and return analysis, project conceptualization and design, to preparation and construction, for commercial, residential, school, and village house customers.	90.0	13.4%
3	Kellon Energy Performance Contracting Limited	Hong Kong	No	It provides a range of new energy solutions and energy-saving and carbon reduction programs, such as: solar energy, wind energy, hybrid power generation system and the LED System so on.	85.0	12.7%
N/A	The Group				44.3	6.6%

Source: Development Bureau, Construction Industry Council, Frost & Sullivan

FROST & SULLIVAN

74

Competitive Landscape of Hong Kong Electrical Construction Works Market

Competition Overview (Cont'd)

- The Group is one of the pioneer in introducing electric equipment in the construction industry in Hong Kong. Electric equipment generally has lower emissions and a smaller carbon footprint compared to traditional diesel-powered equipment. This can help construction companies reduce their environmental impact and contribute to more sustainable construction practices. This also produces little to no direct emissions on-site, leading to cleaner air quality for construction workers and surrounding communities and tends to be quieter in operation compared to diesel-powered machinery. By introducing electric equipment, the Group is positioned as an innovative leader in the construction industry, which helps the Group gain a competitive edge and attract clients seeking more environmentally-friendly construction solutions.
- The Group also has a direct labour ratio of 0.71 in 2023, higher than 0.3 of the industry average in the construction industry in Hong Kong. [To be provided by the Group] A higher direct labor ratio enables the Group to have higher productivity, specialized expertise, operational flexibility, and the ability to deliver high-quality services to its clients. Direct workers are responsible for the hands-on execution of tasks, which can improve the efficiency and pace of the construction process. With a focus on direct labor, the Group can attract and retain highly skilled workers with specialized expertise in various construction trades. This can lead to better quality workmanship and the ability to handle more complex or specialized construction tasks. In addition, having a larger direct labor force allows the Group to be more responsive to changes in project requirements or unexpected challenges. Direct workers can be quickly reassigned or redeployed to address emerging needs, improving the Group's overall flexibility.

Source: Development Bureau, Construction Industry Council, Frost & Sullivan

FROST & SULLIVAN

75

Competitive Landscape of Hong Kong Electrical Construction Works Market

Factors of Market Competition

Technical Expertise and Experience

Electrical construction works require a significant level of technical expertise and experience. Electrical construction works encompass a wide range of projects, including residential, commercial, industrial, and renewable energy installations. The required expertise may vary depending on the specific project scope and complexity, including electrical systems design, cable trenching, laying, and jointing, solar photovoltaic (PV) system design and installation, power distribution and switchgear, wiring and electrical installations. Companies that have a successful history and skilled personnel enjoy an edge in winning contracts and earning client confidence. In contrast, new entrants may encounter difficulties in establishing their reputation and showcasing their capabilities when competing against established industry players. In particular, the use of direct labor can provide contractors with greater control, flexibility, cost savings, and the ability to build a skilled and loyal workforce, all of which can contribute to improved project outcomes and a stronger competitive position in the market.

Established Relationships and Networks

Existing companies often have well-established relationships and networks with clients, suppliers, and industry stakeholders. These relationships are built over time and contribute to securing contracts and accessing project opportunities. Established electrical construction contractors often have a base of loyal, repeat clients who trust their capabilities and have had successful collaborations in the past. These clients prefer to work with companies they know and have confidence in, reducing the need for new business development efforts. New entrants may face difficulties in establishing connections and building trust within the industry.

Access to Resources and Capital

Starting and sustaining an electrical construction business requires a significant amount of capital. New entrants are required to secure the necessary funds to cover initial costs such as equipment, tools, labour recruitment, and marketing expenses. In particular, electrical construction projects require specialized equipment and tools, including excavators, concrete mixers and dumping trucks. Acquiring these resources can be costly, particularly for new companies. Limited access to these resources may hinder the ability to take on projects or limit the scale of projects that can be undertaken.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

76

Competitive Landscape of Hong Kong Electrical Construction Works Market

Entry Barriers Analysis

Cost Competitiveness

Competitive pricing plays a crucial role in securing contracts. Companies that can provide pricing that is competitive while still ensuring high-quality standards have a competitive edge. Achieving cost competitiveness is supported by efficient project management, implementing cost control measures, and employing effective procurement strategies.

Innovation and Adaptability

Having a competitive edge in the industry is possible for companies that embrace technological advancements and innovative solutions. By adopting new techniques, equipment, and materials, they can achieve installations that are more efficient and cost-effective. As electric vehicles technology continues to advance and charging infrastructure expands, the adoption of electric vehicles in construction works is expected to increase, contributing to a more sustainable and environmentally friendly construction industry. The adoption of electric vehicles is also a rising trend in electrical construction works in Hong Kong. Furthermore, being adaptable and responsive to evolving client requirements and industry trends is crucial for maintaining competitiveness.

Reputation and Client Satisfaction

A strong reputation built on positive client experiences and customer satisfaction is a significant competitive factor. Companies that consistently deliver excellent service, maintain open communication, and provide reliable support are more likely to secure contracts and gain a competitive advantage.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

77

Frost & Sullivan's Methodology

- Frost & Sullivan is an independent global consulting firm, which was founded in 1961 in New York. It offers industry research and market strategies and provides growth consulting and corporate training. Its industry coverage in global market includes automotive and transportation, chemicals, materials and food, commercial aviation, consumer products, energy and power systems, environment and building technologies, healthcare, industrial automation and electronics, industrial and machinery, and technology, media and telecom.
- This study has been undertaken through extensive primary and secondary research including interviews with industry experts and market participants, and analysis of official public sources of data, figures, information and reports as well as Frost & Sullivan's independent database and research reports.
- Projected market sizes in this report are estimated through in-depth analysis of the historical macro-economic factors such as the country's economic growth and per capita disposable income, market drivers, future trends and market concentration.
- Bottom-up and top-down methods are applied to cross check and fine tune the obtained figures to arrive at the closest estimate.
- Frost & Sullivan's report was compiled based on the below assumptions:
 1. Growth of Hong Kong economy is assumed to maintain a steady growth over the forecast period;
 2. The social, economic, and political environment in Hong Kong is assumed to be stable during the forecast period;
 3. Additional market drivers such as increasing expenditure on infrastructure development and demand for infrastructures associated with medium to long-term development programmes.

Source: Frost & Sullivan

F R O S T & S U L L I V A N

78

Appendix- Green Construction

Introduction to Green Construction

Introduction of Green Construction

Green construction, which is also referred as sustainable construction or eco-friendly construction, is an approach to building that minimizes the environmental impact of the construction process and the resulting structures. It focuses on the efficient use of resources, reduction of waste, and the creation of healthy, energy-efficient buildings. Green construction aims to promote sustainability throughout the entire life cycle of a building, from design and construction to operation and eventual demolition.

Main Applicable Aspects of Green Construction

Materials

- Using recycled, renewable, or locally sourced materials
- Selecting materials with low embodied energy and carbon footprint
- Utilizing materials that are durable, long-lasting, and require minimal maintenance

Energy efficiency

- Using energy-efficient machinery, equipment and vehicles
- Implementing energy-efficient design strategies
- Incorporating renewable energy systems (e.g., solar panels, wind turbines)

Water conservation

- Implementing water-efficient plumbing fixtures and appliances
- Collecting and reusing rainwater and greywater
- Designing water-efficient landscaping and irrigation systems

Waste reduction

- Minimizing construction waste through effective planning and management
- Recycling and reusing construction materials whenever possible
- Implementing waste separation and recycling programs on-site

Site sustainability

- Minimizing site disturbance and preserving existing ecosystems
- Implementing erosion and sediment control measures
- Encouraging alternative transportation (e.g., bicycle storage, electric vehicle charging stations)

Others

- Using prefabrication and modular construction techniques to reduce on-site waste and energy consumption
- Implementing green construction management practices (e.g., green procurement, green logistics)

Source: Construction Industry Council, Frost & Sullivan

Appendix- Green Construction

Introduction to Solar Energy

Feed-in-Tariff (FiT) is an important initiative to promote the development of renewable energy under the current Scheme of Control Agreements, which were signed between the Government and the respective two power companies, namely the Hongkong Electric Company and CLP Holdings, in April 2017. The applications of the FiT scheme have increased from 60 in 2018 to over 18,000 in 2021. With the concerted effort from the community, the solar among renewable energy significantly increased by 47 TJ in 2018 to 432 TJ in 2021 which is mainly contributed by the FiT scheme.

Source: Construction Industry Council, Frost & Sullivan

80

F R O S T & S U L L I V A N

Appendix- Green Construction

Introduction to Electric Construction Vehicle

Introduction of Electric Construction Vehicle

Electric construction Vehicle falls under a crucial aspect of green construction, namely **energy efficiency**. Rather than fossil fuels, electric construction vehicle are equipped with powerful electric motors and rechargeable batteries to perform same tasks as their diesel-powered counterparts, leading to a significant reduction in greenhouse gas emissions and energy consumption during the construction process. Examples of electric construction vehicles include electric excavators, heavy trucks, bulldozers, dump trucks and loaders.



Electric Excavator



Electric Heavy Truck



Electric Bulldozer



Electric Dump Truck



Electric Loader

Core Competence of Electric Construction Vehicle

- **Operating Efficiency:** Electric motors are inherently more efficient than internal combustion engines, converting a higher percentage of energy input into usable work output, meaning that electric equipment requires less energy to perform the same tasks as diesel-powered machines.
- **Reduced idle time energy consumption:** Electric loaders consume minimal energy when idling, unlike diesel engines that continue to burn fuel even when not in use, hence reducing overall energy consumption on the construction site.
- **Significantly Reduced Pollution:** machines produce significantly less noise pollution compared to their diesel counterparts, improving worksite conditions and reducing the impact on surrounding communities
- **No onsite fuel storage and transportation:** Electric loaders eliminate the need for onsite fuel storage and transportation, reducing the energy consumption and emissions associated with these activities.
- **Reduced energy consumption in ventilation:** As electric loaders produce no exhaust emissions, they require less ventilation in enclosed spaces like tunnels or underground construction sites, leading to reduced energy consumption for ventilation systems.

Source: Frost & Sullivan

81

F R O S T & S U L L I V A N

Appendix- Green Construction

Government Support

Government and Related Support to the Adoption of Electric Construction Equipment

Tender Evaluation Methods for Works Contracts, Development Bureau (DEVB TC(W) No. 4/2014): The document provides a framework for the general marking scheme of tenders, which include the allocation of marks for non-price attributes, one of which is the "environmental management plan and use of environmentally friendly (including low greenhouse gas emissions) products and processes. Such attribute provides an opportunity for construction companies to showcase their commitment to sustainability by highlighting their adoption of environmentally friendly construction process, such as the deployment of electric vehicles, in their technical submissions. By emphasizing the environmental benefits of electric construction equipment, such as reduced tailpipe emissions and lower greenhouse gas emissions, companies can potentially improve their scores in the technical assessment portion of the tender marking scheme.

Construction Innovation and Technology Fund ("CTIF"): The document outlines the funding scope and application guidelines for the CTIF which aims to encourage the adoption of innovative construction methods and technologies to improve productivity, quality, safety and environmental performance in Hong Kong's construction industry. The fund covers areas such as "Advanced Construction Technologies", "Building Information Modelling", "Modular Integrated Construction", and "Multi-trade integrated Mechanical, Electrical and Plumbing". The adoption of electric vehicles by construction companies is seen as a way to reduce the industry's carbon footprint and improve its overall environmental sustainability. If a construction company were to invest in electric vehicles for on-site transportation or material handling, the fund application could potentially fall under the scope of advanced, environmentally friendly equipment, under the "Advanced Construction Technologies" criteria. However, it is important to note that the eligibility of such an application would be subject to the specific equipment and technology being proposed.

Source: Frost & Sullivan

Appendix- Green Construction

Government Support

Government and Related Support to the Adoption of Electric Construction Equipment

New Energy Transport Fund ("NET" Fund): The New Energy Transport Fund is actively promoting the adoption of electric vehicles in Hong Kong, including the construction sector. The fund subsidizes companies such as Ah Ngau Engineering Limited, organizations to trial green innovative transport technologies, including electric vehicles. Construction, Bassey Holdings Limited, Chi Shing Transportation Company, Cinpek Engineering Limited, Darwin Engineering Limited, Grandasy Engineering Company Limited, Pan Kee Engineering Co. Limited, Vast Profit Construction Engineering Limited, and W. L. Engineering (H. K.) Limited have received subsidies to trial electric light goods vehicles for their construction and civil engineering operations. By providing financial support and encouraging the sharing of trial findings among operators, the NET Fund is fostering the wider adoption of electric vehicles in the construction industry, contributing to improved air quality and reduced greenhouse gas emissions in Hong Kong. It is also important to note that the scheme has not yet admitted heavy vehicles such as heavy trucks or dump trucks for subsidies.

Hong Kong government's Climate Action Plan 2050: The Hong Kong government's Climate Action Plan 2050 outlines several initiatives that promote the adoption of electric vehicles in the construction sector. The plan aims to phase out fuel-propelled vehicles and cease new registrations of fuel-propelled private cars by 2035 or earlier, encouraging construction companies like the Group to transition their vehicle fleets to EVs. Additionally, the government will support the installation of EV charging infrastructure in suitable premises, which may include construction sites, making it more convenient for companies to operate EVs.

HK Electric "Smart Power for Construction Site" Service: The "Smart Power for Construction Site" campaign aims to encourage construction companies to switch from diesel generators to electricity from the grid and to adopt electrically-powered construction equipment and vehicles, enabling construction companies to use electric equipment and vehicles, such as electric excavators, electric crawler cranes, and electric bulldozers, instead of traditional diesel-powered machinery.

The "Hong Kong Roadmap on Popularisation of Electric Vehicles" : promote the overall adoption of electric vehicles in Hong Kong, and their associated supporting facilities in Hong Kong. It is important to note that the scheme primarily focuses on electric vehicles for general public use.

Source: Frost & Sullivan

Appendix- Green Construction

Case Study

Case Study of Recent Deployment

Construction Company: Alliance Construction Materials Limited (Alliance) and Bouygues Travaux Publics

Electric Construction Vehicle Supplier: SANY Group

Implementation Date: November 2023

Description: In collaboration with SANY, a leading construction vehicle supplier, Alliance has introduced the first electric concrete mixer truck in the city. This electric mixer truck has been deployed to deliver concrete to the T2 Trunk Road project, aligning with the Hong Kong government's vision of promoting green logistics and the "Hong Kong's Climate Action Plan 2050." The electric mixer truck pilot project, supported by SANY's expertise in electric construction vehicles, serves as a crucial step in evaluating the performance, adaptability, and challenges of electric vehicles in the local construction industry.



Construction Company: Sun Hung Kai Properties ("SHKP")

Electric Construction Vehicle Supplier: SANY Group

Implementation Date: February 2024

Description: SHKP purchased 9 fully electric construction vehicles, including 5 truck-mounted cranes, 2 concrete mixing trucks, and 2 trailer pumps. Some are already being used in SHKP's projects. By switching from traditional diesel-powered equipment to zero-emission electric vehicles, SHKP is taking an important step towards electrification of construction and reducing carbon emissions at worksites. The electric vehicles are expected to cut about 240 tons of carbon emissions annually, equivalent to planting over 10,000 trees.

Source: Frost & Sullivan

Appendix- Green Construction

Case Study

Case Study of Recent Deployment

Construction Company: China State Construction Engineering

Electric Construction Vehicle Supplier: SANY Group

Implementation Date: November 2023

Description: CSHK is gradually promoting the electrification of small and medium-sized machinery and exploring the feasibility of full implementation on more sites. It is also progressively switching to relatively low-carbon biodiesel power generation, rechargeable generators, and introducing hydrogen power generation technology. Currently, CSHK is testing a 21-ton electric excavator and a 50-ton electric tire crane. Besides, CSHK made the major carbon reduction commitments of fully electrifying vehicles used on construction sites by 2035.



Construction Company: Gammon Construction

Electric Construction Vehicle Supplier: Liebherr

Implementation Date: January 2023

Description: Gammon Construction has introduced Hong Kong's first battery-powered crawler crane to help reduce carbon emissions in the construction industry. The new electric crawler crane was delivered from Austria and has a maximum lifting capacity of 160 metric tonnes. It will be deployed on Gammon's Terminal 2 Expansion project at Hong Kong International Airport. The company has set two targets for 2033: reducing its absolute energy-related emissions by 55% and reducing its indirect emissions by 33%.

Source: Frost & Sullivan

Appendix- Green Construction

Industry Norm

In major civil engineering projects, it is not uncommon for the main contractor and subcontractors to form a joint venture to bid on projects. This is often done for several reasons:

1. Diversifying risk by allocating different aspects of the work to different joint venture partners.
2. Requiring fewer resources than if the primary contractor executed the entire project alone.
3. Jointly meeting the minimum working capital requirements.
4. Allowing the subcontractors to participate as the main contractor in projects they may not otherwise qualify for based on the work categories required.
5. The subcontractors being preferred by the customer due to their reputation and track record.

Forming a joint venture allows the parties to leverage their combined expertise and resources to win and execute large-scale civil engineering projects more effectively.

In the civil engineering works and electrical construction works industry, it is not uncommon for the contractors to provide surety bonds in the amount of certain percentage, usually equivalent to 5-10%, of the original contract sum.

Source: Frost & Sullivan

Appendix- Green Construction

Industry Norm

The Hongkong Electric Company and CLP Holdings account for more than 80% of power cabling and civil pipeline installation in Hong Kong in 2023.

The third runway project is one of the largest public infrastructure projects in Hong Kong in terms of total contract sum, at approximately HK\$141.5 billion, and was awarded to a limited number of main contractors. Under the circumstance, it is common for construction contractors which participate in the third runway project to rely on those main contractors or their subcontractors.

It is common for construction contractors to rely on those main contractors who provides zonal electrical cable engineering works for CLP Holdings as the project owner. It is not uncommon for CLP Holdings to issue tenders for electrical cable work projects to contractors located in different districts across Hong Kong. This allows them to leverage the expertise and resources of contractors based in various parts of Hong Kong to carry out necessary infrastructure and maintenance work for their electrical grid and distribution network.

On some occasions, the main contractors may provide certain materials and/or services to its subcontractors. The main contractor would subsequently deduct such amounts in the relevant payment certificates issued to the subcontractors. Based on the Industry Report, main contractors adopted the aforesaid arrangements mainly for the purpose of (i) improving cost effectiveness as main contractors could generally negotiate a more favourable pricing for placing bulk purchase order with suppliers; and (ii) facilitating procurement efficiency by centralising the procurement of materials used for performing different types of construction works under the same construction project. In addition, contra-charge is common in the construction industry especially in more sizeable projects.

The payment arrangements with the CLP Group that final payment is received from the CLP Group upon completion of works under the project (in respect of works which are project-based) or each work order (in respect of works which are term contract based) instead of progress payments is in line with the industry practice of electrical cable engineering.

It is common for construction contractors to, (i) for construction projects, offer a defects liability period of 12 months following the completion of the relevant site works, or for projects in which they act as subcontractor, a defects liability period following the terms of the main contract on back-to-back basis; and (ii) for projects supplying and installing photovoltaic system, provide 1-year warranty on material and workmanship.

It is common and in line with industry practice to have offer credit terms of a period within half-month for customers that are government departments or quasi-public organisations (such as CLPe Solutions Limited) and of a period of one to two months for customers which are non-public organisations.

The Urban Renewal Authority has explored to re-plan, renovate and revitalise old districts including Tsuen Wan in the foreseeable future, and the government has plans in promoting electric vehicles and installing fast charging facilities in districts including Tsuen Wan.

Source: Frost & Sullivan

Appendix- Green Construction

Airport Authority

Hong Kong International Airport, operated and managed by the Airport Authority Hong Kong ("AAHK") has been a hub of construction activity for many years, with the Three-runway System ("3RS") being one of its most significant recent projects since 2016, which is set to be completed and commissioned by the end of 2024. However, it's crucial to note that AAHK's commitment to infrastructure enhancement extends far beyond this single project. As we examine AAHK's past investments, current initiatives, and future plans, it becomes evident that there is a continuous pipeline of construction and development projects aimed at maintaining Hong Kong International Airport's status as a world-class aviation hub.

Looking beyond 2024, AAHK's development pipeline includes several key infrastructure projects. For instance, the Airport City Link, planned to start in 2025 and expected to be completed by 2028, will be a vehicular and pedestrian bridge run by an autonomous transportation system connecting Hong Kong Boundary Crossing Facilities Island and SKYCITY, and will later extend to Tung Chung town center, totaling about 3.8 kilometers and involves substantial amount of civil engineering and electrical construction services

Further, a review of AAHK's current tender listings and envisioned upcoming tenders reveals a diverse range of ongoing construction and maintenance projects. These include substantial works across various areas of the airport, such as (i) building maintenance and refurbishment; (ii) hydraulic systems upgrades; (iii) passenger facility enhancements; and (iv) infrastructure revitalization. The scope of these projects encompasses Terminal 1, associated buildings, and other key airport facilities. The breadth and depth of these tenders indicate a continuous demand for related civil engineering and electrical construction services at Hong Kong International Airport.

Source: Annual Report of Airport Authority Hong Kong, Frost & Sullivan

88

F R O S T & S U L L I V A N

Appendix- Green Construction

Airport Authority

Analyzing quantitatively, the Outstanding Commitments in respect of Capital Expenditure of Airport Authority represent future financial obligations for planned infrastructure projects. These commitments are categorized into two key components: "Contracted for," which refers to projects with signed agreements where work is either ongoing or imminent, and "Authorised but not contracted for," indicating approved projects that are yet to be formally contracted. This breakdown provides insight into both immediate and future development plans. During 2018 to 2024, while the 3RS project has progressed significantly in earlier years, the non-3RS expenditures have notably increased, with the contracted amount for non-3RS projects rose from HK\$6,679 million to HK\$9,243 million, representing a CAGR of approximately 5.6%, and the authorized but not contracted figure jumped from HK\$16,231 million to HK\$24,708 million, representing a CAGR of approximately 7.3%, demonstrating AAHK's dedication to ongoing infrastructure development beyond the 3RS, offering continued opportunities for the construction and engineering sector well into the future.

Outstanding Commitments in respect of Capital Expenditure of Airport Authority, 2018-2024

HK\$ million	2018	2019	2020	2021	2022	2023	2024	CAGR (2018-2024)
3RS								
Contracted for	27,777	20,649	27,944	48,636	39,663	20,848	3,473	-29.3%
Authorised but not contracted for	98,047	87,478	64,999	28,346	15,648	13,518	9,438	-32.3%
Others (Non-3RS Project)								
Contracted for	6,679	5,198	6,864	6,560	6,747	8,238	9,243	5.6%
Authorised but not contracted for	16,231	17,199	25,193	26,498	25,484	25,006	24,708	7.3%

Source: Annual Report of Airport Authority Hong Kong, Frost & Sullivan

89

F R O S T & S U L L I V A N

Appendix- Green Construction

SANY Heavy Industry Co., Ltd

SANY Heavy Industry Co., Ltd. is the sixth largest manufacturer in the global construction equipment market, with the revenue of RMB73,221.7 million in 2023. SANY offers a wide range of products, including excavators, cranes, concrete machinery, and road machinery. In Hong Kong, SANY's equipment is utilized in various construction projects, from infrastructure development to commercial construction. Their presence in the region is part of a broader strategy to expand their market reach internationally. SANY's commitment to quality and innovation has made it a preferred choice among contractors and construction companies in many markets, including Hong Kong. SANY serves a diverse range of customers in Hong Kong, primarily within the construction and infrastructure sectors and the customers include Gammon Construction, China State Construction Engineering Corporation, Hong Kong Civil Engineering and Development Department, Hong Kong Housing Authority, Sun Hung Kai Properties and Sun Hung Kai Properties. SANY's reputation for quality and innovation helps it attract a wide array of customers within these sectors, contributing to its growth and presence in the Hong Kong market. The construction equipment market in Hong Kong is relatively concentrated, dominated by a few key players, including SANY. It is common for the distributors to source construction equipment from SANY in Hong Kong.

Source: Frost & Sullivan



Thank You!

