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Legislative Council of the Hong Kong Special Administrative Region

Delegation of the Panel on Environmental Affairs

Report on the duty visit to Mainland cities of the Greater Bay Area

7 to 9 August 2023

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Chapter 1: Introduction

Purpose

1.1 The Legislative Council ("LegCo") Panel on Environmental Affairs ("Panel") conducted a three-day duty visit jointly with Government officials from the Environment and Ecology Bureau ("EEB") to three cities in the Guangdong-Hong Kong-Macao Greater Bay Area ("GBA"), namely Guangzhou, Foshan and Shenzhen, from 7 to 9 August 2023, to obtain first-hand information about the latest developments of these Mainland cities in GBA in areas such as adoption of new energy transport, clean energy and renewable energy, and technologies for turning waste to energy. This report presents the visit highlights and observations of the Delegation of the Panel.

Background and objectives of the visit

1.2 The Administration announced Hong Kong's Climate Action Plan 2050 in October 2021, which set out four major decarbonization strategies, namely "net-zero electricity generation", "energy saving and green buildings", "green transport" and "waste reduction", to facilitate Hong Kong in reducing its carbon emissions by 50% before 2035 as compared to the 2005 level and achieving carbon neutrality by 2050.

1.3 The Panel has been monitoring closely the Administration's progress of work in decarbonization, including improvement of air quality, promotion of wider adoption of electric vehicles ("EVs") and other new energy vehicles, increase of use of clean energy and renewable energy for power generation, and promotion of waste reduction and recycling to reduce the carbon emission caused by refuse handling.

1.4 Taking into account Hong Kong's decarbonization objectives and strategies, and the successful experiences of Mainland cities of GBA in related initiatives, Panel Chairman, Hon Elizabeth QUAT, explored with the Secretary for Environment and Ecology, Mr TSE Chin-wan, at their workplan meeting in early 2023 a joint duty visit to study the latest developments of Mainland cities of GBA in areas such as adoption of new energy transport, clean energy and renewable energy, and technologies for turning waste to energy.

1.5 At its meeting on 21 April 2023, the Panel agreed in principle to conduct a duty visit jointly with Government officials from EEB to Mainland cities of GBA (as the Panel Delegation and the EEB Delegation, respectively). The Panel also agreed that other Members should be invited to join the duty visit. After EEB's consultation with relevant Mainland departments and organizations, the duty visit was scheduled to take place from 7 August to 9 August 2023.

1.6 The objectives of the duty visit are as follows:

(a) to obtain first-hand information on adoption of new energy transport (e.g. EVs and hydrogen fuel cell vehicles) in Mainland cities of GBA;

(b) to gauge experience of these cities in the application of hydrogen energy technologies (including hydrogen fuel storage, refueling and hydrogen-powered public transportation);

(c) to observe the development of renewable energy and other zero-carbon energy, as well as waste-to-energy ("WtE") technologies (especially municipal solid waste incineration technique) in these cities; and

(d) to exchange views with the relevant Mainland authorities on issues of mutual concern and cross-boundary collaboration in environmental protection.

1.7 At its meeting on 7 July 2023, the LegCo House Committee endorsed the proposal for the Panel to conduct a duty visit to Mainland cities of GBA.

Membership of the Delegation of the Panel on Environmental Affairs

1.8 The Delegation of the Panel comprised of the following five members: [1]

Chairman of the Panel and leader of the Delegation

Hon Elizabeth QUAT, SBS, JP

Members of the Panel

Hon Frankie YICK Chi-ming, GBS, JP
Ir Dr Hon LO Wai-kwok, GBS, MH, JP
Hon CHAN Pui-leung

Non-Panel Member

Hon Andrew LAM Siu-lo, SBS, JP

1.9 Ms Angel SHEK, Chief Council Secretary(1)1, and Mr Jason KONG, Senior Council Secretary(1)1 of the LegCo Secretariat, accompanied the Delegation during the duty visit.

1.10 The membership list of the EEB Delegation is in the **Appendix**.

[1] Unless otherwise stated, the "Delegation" referred to in subsequent paragraphs of this report is the Delegation of the Panel.

The Delegation poses for a group photo before departure at the Hong Kong West Kowloon Station

Visit programme

1.11 The major programme of the Delegation is listed below:

Monday, 7 August 2023	
Morning	Meet at the Hong Kong West Kowloon Station and take the high-speed train to Guangzhou
	Meet with the Department of Ecology and Environment of Guangdong Province
Afternoon	**Visit the Guangzhou Public Transport Group - the Yanling new energy eco-industrial park**
	Visit the Guangzhou Public Transport Group - the Guangzhou Public Transport Command Center
Evening	Travel to Foshan
Tuesday, 8 August 2023	
Morning	**Visit Nanhai Hydrogen Center**
	Visit hydrogen fuel cell tram
Afternoon	Travel to Shenzhen
	Visit the exhibition hall of Huawei Digital Power AntoHill Headquarters
	Visit the EV Supercharger of Huawei
Wednesday, 9 August 2023	
Morning	**Visit Daya Bay Nuclear Power Station**
Afternoon	**Visit the Nanshan Energy Eco-Park (waste incineration plant)**
Afternoon	Return to Hong Kong via the Shenzhen Bay Port

Chapter 2:
Visit to Guangzhou

Overview

2.1 Located in the south-central part of Guangdong Province and the northern part of GBA, Guangzhou is the provincial capital of Guangdong Province, serving as the political, economic, technological, educational and cultural centre of the province. The city extends across an area of 7 434 km^2.

2.2 Guangzhou is the most populous city in the Guangdong Province, with a permanent population of 18.81 million as the end of 2021, of which the registered population was 10.12 million (representing 53.8% of the permanent population).

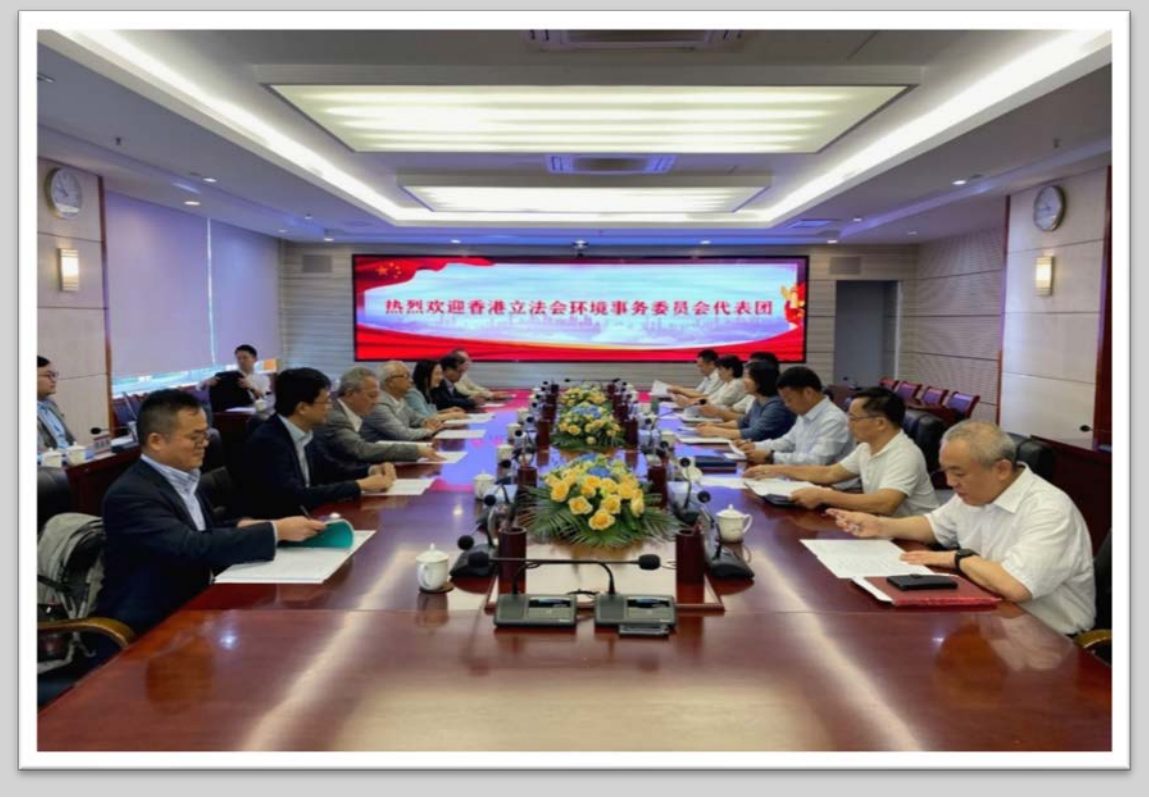
2.3 According to the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area promulgated by the Central Government on 18 February 2019, the four central cities of Guangzhou, Hong Kong, Macao and Shenzhen will serve as the core engines of regional development, leveraging their comparative advantages to strengthen their radiating effect and lead the development of nearby regions. Besides, the Outline also mentioned that Guangzhou and Foshan should leverage the leading roles of their strong combinations to expedite the integrated development of the two cities.

2.4 Guangzhou formulated the Implementation Plan for Carbon Peaking in March 2023, setting out a key target for the city to achieve the peak of carbon emissions by 2030. In 2022, Guangzhou's emission of fine suspended particulates met the target throughout the year with a record low of average concentrations; the city has completed the fifth WtE Plant, Phase 2 project, cleared 2 049 "scattered, disordered and dirty" sites and was designated as one of the 60 key cities nationwide for the development of a recycling system for waste materials.

2.5 The main programme of the Delegation in Guangzhou included meeting with the Department of Ecology and Environment of the Guangdong Province, and visits to the Yanling new energy eco-industrial park and the Guangzhou Public Transport Command Center of the Guangzhou Public Transport Group.

Meeting with the Department of Ecology and Environment of Guangdong Province

2.6 The Delegation travelled from Hong Kong to Guangzhou by high-speed train on the morning of 7 August. The first activity was to meet with the Director-General of the Department of Ecology and Environment, Ms XU Xiaoxia, the Deputy Director-General, Mr JIANG Hongqi, and other Directors of relevant Divisions under the Department, including Division of Water Ecology and Environment, Division of Atmospheric Environment, Division of Soil Ecology and Environment as well as Division of Solid Wastes and Chemicals.



The Delegation meets with the officials
of the Department of Ecology and Environment

2.7 The Department of Ecology and Environment began the meeting with an overview of pollution prevention and control in Guangdong Province (especially in GBA), followed by a briefing on the prevention and control situation in the province with regard to water pollution, air pollution, soil pollution and solid waste pollution. It then exchanged views with the Delegation on various issues relating to environmental protection cooperation, including facilitating the establishment of a taskforce on "waste-free Bay Area", and the prevention and control of air pollution, marine pollution and marine refuse in Guangdong and Hong Kong, as well as the mechanism for ecological and environmental protection in Guangdong, Hong Kong and Macao.

2.8 The Delegation agrees that various pollution prevention and control work in GBA should be carried out in a holistic manner so as to enhance the effectiveness of water quality, air quality, ecology and waste management in the region. In this connection, Hong Kong and Mainland cities of GBA should continue to step up exchanges and cooperation in terms of technology and experience, with a view to exploring and deepening collaborative governance and capacity sharing.

2.9 The Delegation then attended a luncheon hosted by the Department of Ecology and Environment, during which both parties further exchanged views on the strategies and practical experience of Guangdong and Hong Kong in achieving carbon neutrality.

Yangling new energy eco-industrial park

2.10 On the afternoon of 7 August, the Delegation visited the Yangling new energy eco-industrial park of the Guangzhou Public Transport Group to learn about the development of energy storage, charging and battery swapping facilities for electric public transport vehicles in Guangzhou.

2.11 The Delegation notes that the Guangzhou Municipal Government published the New Energy Vehicles Development Work Plan of Guangzhou (2017-2020) in October 2017, which for the first time put forward a target to comprehensively promote the electrification of buses and required that, from 2017, every newly purchased or replaced bus must be pure EVs. Since 2018, the Guangzhou Municipal Government also required that pure electric taxis must account for 80% or above of all newly purchased or replaced taxis. The percentage will increase by 5 % each year from 2018, reaching 100% by the end of 2022. Taking the example of promoting the use of electric buses, the Guangzhou Municipal Government has been providing direct financial subsidies for new energy buses since August 2018 for a period of five years. Bus companies can receive purchase subsidies of up to RMB 450,000 (HK$533,000) from the central and local authorities for large electric buses over 10 metres in length, and emission reduction incentives of RMB 590,000 (HK$699,000) (to be disbursed over a period of eight years.). With the aforesaid financial subsidies, the number of pure electric buses in Guangzhou surged 16-fold from 770 at the end of 2017 to 13 270 by the end of 2021.

2.12 The Delegation learns that in September 2022, the Guangzhou Municipal Government issued the Three-Year Action Plan for Accelerating the Development of Electric Vehicle Charging Infrastructure (2022-2024), with the aim of becoming the "Supercharging Capital" by 2024 and establishing a charging service system that "offers both fast and slow charging in an orderly manner". Specifically, Guangzhou will build 1 000 additional super-fast chargers, 700 slow charging communities and 200 battery swapping stations by 2024, increasing the capacity of the city's charging and battery swapping facilities to 4 million kW. As at the end of June 2022, Guangzhou has 76 300 public and private EV charging posts with a total capacity of 3.2 million kW; the ratio of charging posts to EVs is about 1:4.6, equivalent to charging more than 760 000 EVs each day.

2.13 During its visit to the Yangling new energy eco-industrial park, the Delegation observed the outdoor cascade battery energy storage facilities. These facilities use retired traction battery for energy storage and improve operational efficiency and extend component life expectancy through an energy management system. The benefits of the facilities are cost advantages and better utilization of the value of the traction battery.

The Delegation and representatives from the Guangzhou Public Transport Group at the Yangling new energy eco-industrial park

Staff of the Yangling new energy eco-industrial park briefs the Delegation on the outdoor cascade battery energy storage facilities

The Delegation and Mr TSE Chin-wan, Secretary for Environment and Ecology pose for a group photo in front of the outdoor cascade battery energy storage facilities

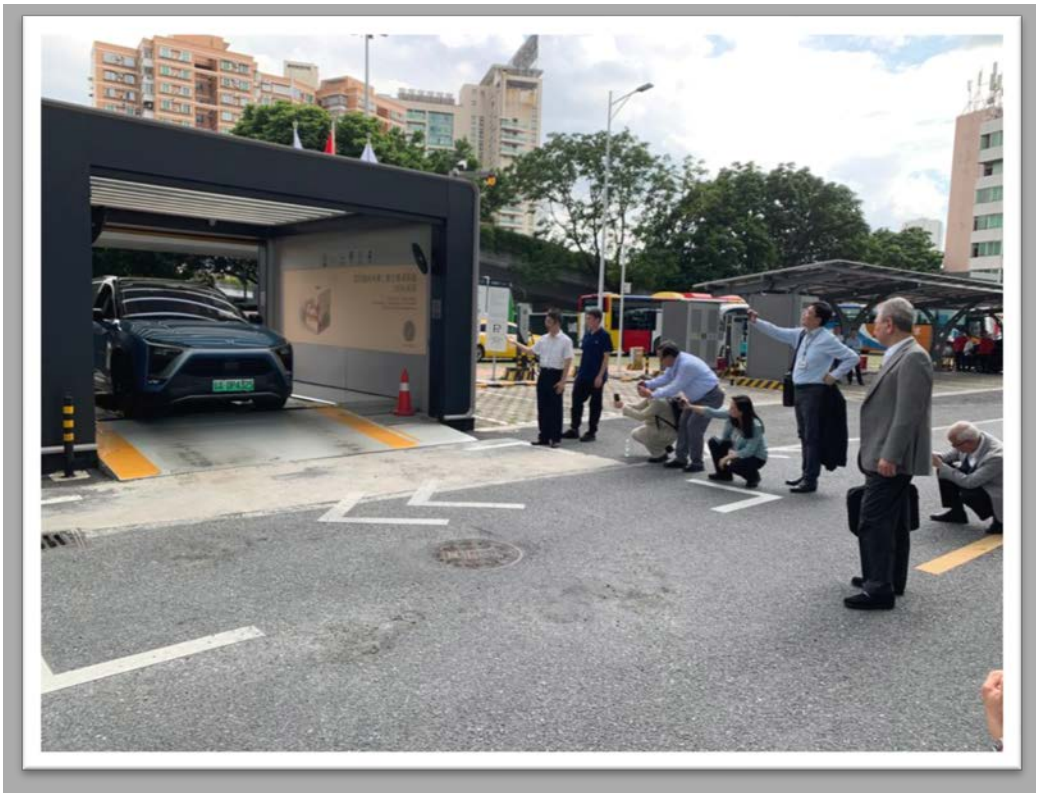
2.14 The Delegation then visited the "integrated micro-photovoltaic storage and charging" demonstration station, a system that combines photovoltaic ("PV") power generation, energy storage and liquid cooling ultra-fast charger. Compared with conventional EV charging facilities, the advantages of such integrated power generation and storage facilities are that they can be connected to renewable energy and increase power capacity more flexibly, which helps reduce the pressure of EV charging on the power grid.

2.15 The Delegation also observed the battery swapping process of EVs at the vehicle charging and battery swapping stations, and learnt that by using technologies including automatic positioning, the fully-automated battery swapping process can be completed under the vehicle chassis, taking only a few minutes. In addition, the charging posts inside the Yangling new energy eco-industrial park support "vehicle to grid" technology (i.e., sending electricity stored in EVs to the power grid). Given the peak-valley electricity pricing mechanism in Guangzhou's electricity market, EV users can charge their vehicles at a lower rate at night and send some of the electricity back to the grid at a higher rate during the day, thereby earning arbitrage profits. The merit of such a mechanism is that it helps balance grid loads at different times of the day, achieving the result of "peak-shaving and valley-filling".

The Delegation visits the "integrated micro-photovoltaic storage and charging" demonstration station

Leader of the Delegation, Hon Elizabeth QUAT, stands beside a charging post that supports “vehicle to grid” technique

The Delegation visits the liquid cooling ultra-fast charger



The Delegation observes the fully-automated battery swapping process conducted under the vehicle chassis

Guangzhou Public Transport Command Center

2.16 After visiting the Yangling new energy eco-industrial park, the Delegation went to the Guangzhou Public Transport Command Center of the Guangzhou Public Transport Group to visit its smart exhibition centre, safety monitoring equipment and integrated dispatch and command centre.

2.17 The smart exhibition centre showcases the development of the Guangzhou Public Transport Group in new energy transport, including the progress of the comprehensive electrification of taxis and the charger management platform. The Delegation notes that the Guangzhou Public Transportation Group currently owns about 13 000 buses and 10 000 taxis. The integrated dispatch and command centre of the Guangzhou Public Transport Command Center can carry out daily production scheduling, emergency command, data analysis and research. Its functions include production scheduling, coordination, emergency response, process monitoring, data application, information reception and transmission, so as to alleviate the growing pressure of public transport management and achieve an intelligent management model.

2.18 The Delegation visited the intelligent operation and management platform at the Guangzhou Public Transport Command Center which applies various big data, such as the “Ruyue” customized bus service. The service is a real-time system that designs bus routes according to the demand and passenger flow. It combines the features of both online ride-hailing and public transport, providing more personalized services under the premise of energy saving and emission reduction.

Real-time management of the Guangzhou Public Transport Command Center and the monitoring of the “Ruyue” customized bus service

The Delegation receives a briefing from the personnel of the Guangzhou Public Transport Command Center

The Delegation poses for a group photo at the Guangzhou Public Transport Command Center

Chapter 3:
Visit to Foshan

Overview

3.1 Foshan is located on the west bank of the Pearl River in the south-central part of Guangdong Province, adjoining Guangzhou on the east. The city extends across an area of 3 798 km^2.

3.2 At the end of 2021, Foshan's permanent population stood at 9.61 million with a registered population of 4.84 million (representing 50.4% of the permanent population).

3.3 In 2022, Foshan's gross domestic production reached RMB 1.27 trillion, an increase of 2.1%, ranking after Guangzhou and Shenzhen in Guangdong Province in terms of the scale of the economy.

3.4 Foshan introduced a fuel cell air compressor production project as early as in 2009. In 2014, Foshan joined the "Accelerating the Commercialization of Hydrogen Fuel Cell Vehicles in China" project under the Ministry of Science and Technology and the United Nations Development Programme as one of the four demonstration cities in the country. In September 2022, the Foshan Municipal Government released the 14th Five-Year Plan for Energy Development in Foshan, setting forth focus on the development of new energy industries, such as the hydrogen energy industry, in order to become a national demonstration zone of the hydrogen energy industry and a development base of new energy industries, including increasing the number of hydrogen fuel cell vehicles to 5 500 by 2025, and increasing the number of hydrogen refilling stations to 60 by 2025. Foshan is now one of the leading cities in the country in terms of the number of hydrogen fuel cell vehicles and hydrogen refilling stations, and has established the first commercially run hydrogen refilling station in the country, the first oil-hydrogen station in the Mainland, and the first commercially run hydrogen fuel cell tram in the world.

3.5 The Delegation travelled to Foshan in the evening of 7 August, and visited the Nanhai Hydrogen Center and hydrogen fuel cell tram on the morning of 8 August. During its stay in Foshan, the Delegation attended a luncheon hosted by the Taiwan, Hong Kong and Macao Affairs Office of the CPC Foshan Municipal Committee and exchanged views with the leaders on the development of hydrogen energy in the two places.

Nanhai Hydrogen Center

3.6 In 2018, Foshan established "Xianhu Hydrogen Valley" covering a land area of 48 square kilometres in Danzao Town, Nanhai District, which serves as a hydrogen energy technology centre integrating technology research and development ("R&D"), smart production, exhibition and exchange, innovative services, and as the "Silicon Valley" for the hydrogen energy industry in the Mainland. Xianhu Hydrogen Valley has attracted more than 130 hydrogen energy enterprises to set up operations there, including State Power Investment Corporation, Cummins and Shanghai Refire Group, representing one-third of such enterprises in Guangdong Province. The Nanhai Hydrogen Center in Xianhu Hydrogen Valley was also opened for public visit at the end of 2019. Between 2020 and 2022, Foshan built the Foshan Xianhu Laboratory in Xianhu Hydrogen Valley at a cost of RMB 1.88 billion (approximately HK$2.1 billion), focusing on technology R&D and industrialization of hydrogen energy, fuel cells, hydrogen-ammonia fusion, etc. and forging a complete hydrogen energy industry chain that integrated the industry, academic and research sectors.

3.7 The Nanhai Hydrogen Center is a themed exhibition centre of the technology industry focusing on hydrogen energy and its industrialization. The Center consists of a main exhibition hall and four annexes, with seven major exhibition areas that present the overall thinking and strategies of hydrogen energy development in Nanhai through multimedia means. Targeting the public and upstream and downstream enterprises of hydrogen energy, Nanhai Hydrogen Center provides a detailed introduction of the planning and achievements of hydrogen energy development in Nanhai District from the perspective of the entire industry chain, so that the public can quickly understand and become familiar with the situation of the hydrogen energy industry in Nanhai District as well as the development mode in the zone, thereby attracting hydrogen energy organizations and research institutes at home and abroad to commence cooperation and facilitating exchanges. The Center also serves as a popular science publicity and education base for hydrogen energy, so that the public can understand and experience first-hand the application of hydrogen energy in their daily lives, which can help promote the development of a hydrogen society.

3.8 At the Nanhai Hydrogen Center, the Delegation learns about each part along the hydrogen energy industry chain, including demonstration of application and solutions of hydrogen production, transportation, storage, pressurization, and supply to customers. One of the solutions is a skid-mounted hydrogen refilling station, which is a container-based hydrogen storage and refilling solution. The container is partitioned into three parts: the hydrogen storage tanks, the compressors and the hydrogen refilling zone. The design of such a hydrogen refilling station has the advantages of small footprint, ease of transport, etc. In addition, Nanhai has set up a "hydrogen energy in households" intelligent energy demonstration community, which utilizes natural gas reforming for hydrogen production and applies fuel cell technologies co-powered by heat and electricity to reduce carbon emissions by 50% and energy costs by 45%. Outside the Nanhai Hydrogen Center, the Delegation experienced various hydrogen energy transportation solutions, such as hydrogen-fuelled motorcycles, hydrogen fuel cell trucks and hydrogen fuel cell buses.

3.9 The Delegation notes that Foshan is one of the key pioneers in the Mainland in setting relevant standards for hydrogen storage and refilling facilities. From the end of 2017 onwards, the Foshan Municipal Government has released procedural guidelines for the construction, approval and acceptance of the Mainland's first group of hydrogen refilling stations, which were drawn on by various places across the country. In March 2018, under the approval of the Technology Standardization Committee of the State Administration for Market Regulation, Foshan became the only innovation base in the Mainland for national technology standards on hydrogen energy, and has so far assisted in the formulation of more than 15 national standards related to hydrogen energy.

3.10 The Delegation also notes that Foshan is a pioneer in the Mainland and the world in the application of hydrogen-powered public transport. In 2016, Foshan pioneered the operation of 11 hydrogen-powered buses on a trial basis in Sanshui District, launching the first hydrogen-powered city bus demonstration route in the Mainland. Foshan has now transitioned to a fleet consisting entirely of new energy buses, of which 15% are hydrogen-powered buses, with a cumulative number of around 1 000.

Xianhu Hydrogen Valley, a characteristic town in Danzao Town, Nanhai District, Foshan

The Delegation learns about the “hydrogen energy in households” project

The Delegation is briefed on hydrogen fuel cell trucks

Delegation members take a test ride on hydrogen-fuelled motorcycles

The Delegation takes a ride on a hydrogen fuel cell bus

The Delegation receives a briefing from the personnel of Nanhai Hydrogen Center on the design and operation of hydrogen refilling stations

The Delegation poses for a group photo with Mr TSE Chin-wan, Secretary for Environment and Ecology, and representatives of Nanhai Hydrogen Center

Hydrogen fuel cell tram in Gaoming District

3.11 After the visit to the Nanhai Hydrogen Center, the Delegation went to a hydrogen refilling service centre in Gaoming District, Foshan. In addition to supplying hydrogen to the hydrogen fuel cell tram in the district, the service centre also has hydrogen refilling nozzles for refilling hydrogen-powered buses, logistics vehicles, etc.

3.12 The Delegation then took a ride on a hydrogen fuel cell tram in Gaoming District. The tram line, which commenced operation in December 2019, is the world's first commercially run hydrogen-powered tram line. The tram has a range of about 100 kilometres when fully refilled with hydrogen. With a low-floor design, it runs at an average speed of 24 kilometres per hour with a maximum speed of 70 kilometres per hour.

The hydrogen refilling service centre in Gaoming District, Foshan

Hydrogen fuel cell tram

The Delegation takes a ride on a hydrogen fuel cell tram

Chapter 4:
Visit to Shenzhen

Overview

4.1 The city of Shenzhen, also known as "Pengcheng", is located adjacent to Hong Kong. It covers an area of 1 997 km^2 and had a permanent population of 17.68 million at the end of 2021. This population consists of a registered population of only 5.56 million and 12.12 million people without local household registrations (representing 68.5% of the permanent population).

4.2 Under the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area, the four central cities of Shenzhen, Hong Kong, Macao and Guangzhou will serve as the core engines of regional development, leveraging their comparative advantages to strengthen their radiating effect and lead the development of nearby regions.

4.3 The main programme of the Delegation in Shenzhen include visits to the exhibition hall of the Huawei Digital Power AntoHill Headquarters ("Huawei Digital Power" is the short form of Huawei Digital Power Technologies Co., Ltd), a Huawei supercharging station for EVs, the Daya Bay Nuclear Power Station ("DBNPS") and the Nanshan Energy Eco-Park. During its stay in Shenzhen, the Delegation attended dinner/lunch/tea reception hosted by Huawei Digital Power, DBNPS and the Nanshan Energy Eco-Park respectively.

Exhibition hall of the Huawei Digital Power AntoHill Headquarters

4.4 The Delegation travelled from Foshan to Shenzhen on the afternoon of 8 August 2023, and visited the exhibition hall of the Huawei Digital Power AntoHill Headquarters. Members received a briefing by Huawei Digital Power Technologies Co., Ltd on its power products and solutions in areas such as energy conservation and emission reduction, smart PV, and data centre. After leaving the Huawei Digital Power AntoHill Headquarters, the Delegation also visited a Huawei ultra-fast charging station for EVs on their way to the Huawei Bantian Headquarters, the venue for the dinner.

4.5 Huawei Digital Power, a wholly-owned subsidiary of Huawei Technologies Co., Ltd., was established in June 2021. In July 2022, Huawei Digital Power inaugurated and put into operation its AntoHill Headquarters in Xiangmihu, Futian District, Shenzhen. The Headquarters covers an area of 18 000 m^2, within which there are three buildings that accommodate offices, training centres, laboratories, exhibition halls, staff dormitories, canteens, etc. The exhibition hall showcases the products and solutions developed by Huawei Digital Power in various business areas, including smart PVs, site power facility, data centre facility, DriveONE and charging networks, etc.

4.6 The Delegation notes that the Action Plan for Carbon Dioxide Peaking Before 2030 issued by the State Council in October 2021 requires all local governments to construct buildings with the use of the PEDF (i.e. PV, energy storage, direct current ("DC") and flexibility) technology. AntoHill Headquarters is one of the first batch of the 28 pilot projects for the near-zero carbon emission zones announced in Shenzhen in 2021. It also serves as a demonstration site for the application of PEDF technology. PEDF technology refers to a technology that integrates PV power generation, energy storage, DC power distribution and flexible power consumption:

(a) PV power generation: The façade of the three buildings within the AntoHill Headquarters have been installed with building-integrated PV glass curtain walls that cover nearly 30 000 m^2, providing a renewable power source for the campus;

(b) Energy storage: By implementing the smart PV and storage integration solution, the headquarters has established a 2 MWh electrochemical energy storage system, allowing surplus electricity to be stored during off-peak hours and discharged during peak hours;

(c) DC power distribution: The headquarters buildings are equipped with an AC ("alternating current")/DC microgrid architecture, where the DC distribution system is directly connected to the renewable energy produced by PV power generation. Compared with the conventional AC distribution system, the low-voltage DC distribution system has the advantages of easy control, high transmission efficiency and safer power supply; and

(d) Flexible power consumption: Each electric-powered device in the headquarters buildings is interruptible, adjustable and controllable, allowing the buildings' electricity demand to change from rigid to flexible. This enables real-time coordination between the buildings' electricity consumption and the PV energy yields or the capacity of the energy storage system.

4.7 In addition to hardware support, the AntoHill Headquarters also utilizes the Dual-carbon Co-Mind system and technologies like energy-saving artificial intelligence to manage, among others, the building's energy storage and charging infrastructure, and to monitor energy and emission data in real time.

4.8 The Delegation notes that the PEDF system adopted at the AntoHill Headquarters has achieved remarkable results in energy saving and emission reduction. Its PV power generation system can produce 1.5 million kWh of PV green power every year, which is equivalent to reducing carbon dioxide emissions by about 871.5 tonnes. Through a highly efficient integrated energy management system, the headquarters has reduced its annual electricity consumption by 51% and annual carbon emissions by 63%.

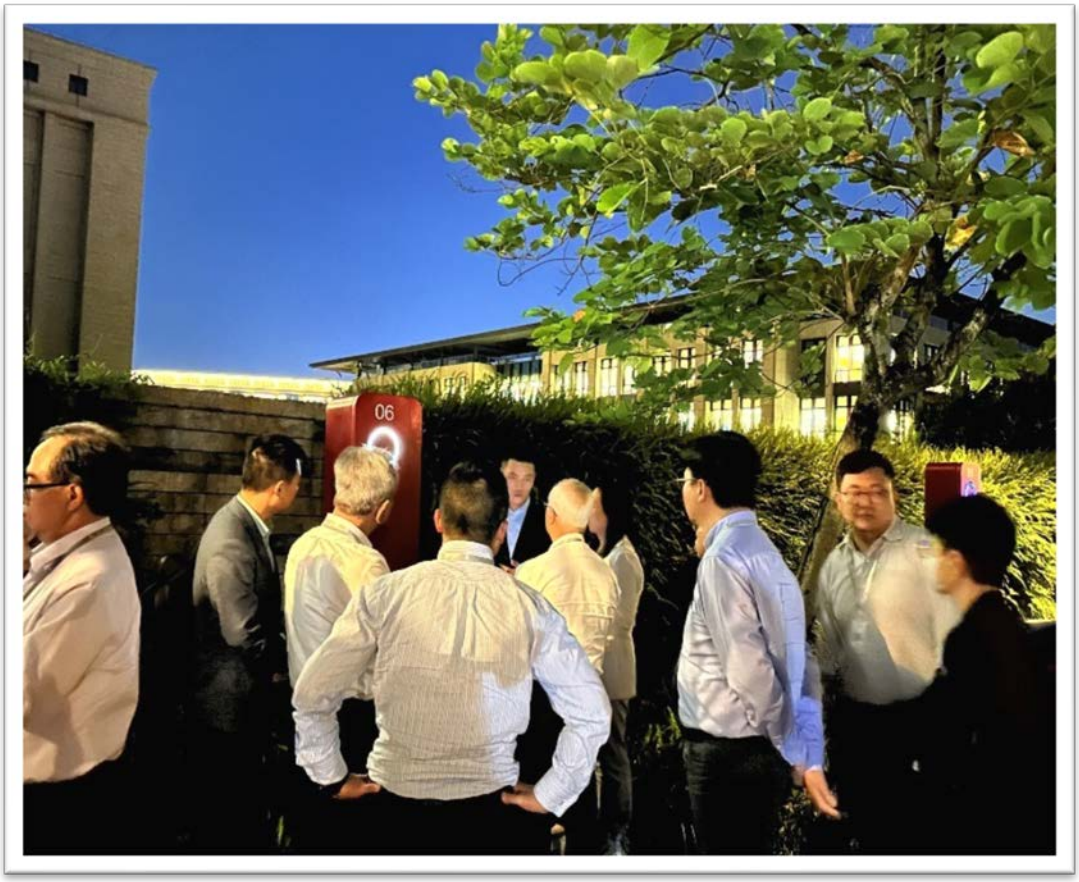
4.9 The Delegation observed a number of new energy and renewable energy facilities and smart energy management solutions at the exhibition hall of the AntoHill Headquarters. For example:

(a) Building integrated PV glass curtain walls: Transparent thin-film solar cells("TFSCs") are installed on the inner side of the glass. With a certain level of light transmittance, TFSCs have a relatively minimal landscape impact. The Smart PV Optimizer on the back of the PV modules manages the maximum power point of each module in real time to increase the electricity generating capacity of the PV system;

(b) Liquid cooling ultra-fast charging station: The maximum power output of each charger is up to 600 kW; and

(c) FusionSolar Smart String Energy Storage Solution: The application of various smart technologies optimizes the management of batteries, enhancing their charging and discharging capabilities throughout their lifespan and reducing energy storage costs.

Delegation members pose for a group photo with Mr TSE Chin-wan, Secretary for Environment and Ecology, and representatives of Huawei Digital Power AntoHill Headquarters at the exhibition hall



The Delegation visits Huawei's ultra-fast EV charging station

Daya Bay Nuclear Power Station

4.10 The Delegation visited DBNPS on the morning of 9 August, including the exhibition hall, refuelling pool and training centre (a simulated main control room).

4.11 The Daya Bay Nuclear Power Site is located in the Dapeng Peninsula in Shenzhen, about 50 km north-east of the Hong Kong city centre. The site consists of two power stations, namely Guangdong Nuclear Power Station and Lingao Nuclear Power Station. DBNPS, completed and commenced operation in May 1994, is the first large-scale commercial nuclear power station in the Mainland, as well as the largest joint venture project launched in the early days of our country's reform and opening up. DBNPS is owned by the Guangdong Nuclear Power Joint Venture Company Limited, with operation, maintenance and technical support provided by the Daya Bay Nuclear Power Operations and Management Co., Ltd. under the China General Nuclear Power Group Co., Ltd.. The station has two pressurized water reactor generating units with a gross capacity of 1.968 million kW, generating over 15 billion kWh of electricity per year.

4.12 The Delegation notes that a defence-in-depth principle is adopted in DBNPS to provide several levels of multiple protection covering plant site selection, plant design, operational safety and performance monitoring:

(a) Prudent site selection: The DBNPS site was selected based on international guidelines and the results of the safety assessment by the National Nuclear Safety Administration. For example, Daya Bay, which is 1 000 km from the nearest tectonic boundary, has a lower risk of being affected by major earthquakes. In addition, Daya Bay is well protected from the impact of tsunamis as it is located in a shallow inner bay surrounded by promontories and islands and with the islands of Taiwan and the Philippines as external barriers. The power station is also sufficiently distant from commercial flight paths, major cities and hazardous industrial installations to ensure the safety of the local community;

(b) Safety facilities: The two pressurized water reactor units at the power station have good safety records. Given prudent operation and maintenance, the lifespan may be extended from 40 years to around 60 to 80 years. Connected to the reactor, the first cooling circuit of the units is a closed circuit confined inside the containment building. It has no direct contact with the cooling water in other cooling circuits. Any radioactivity in the cooling water in the first circuit will not be spread;

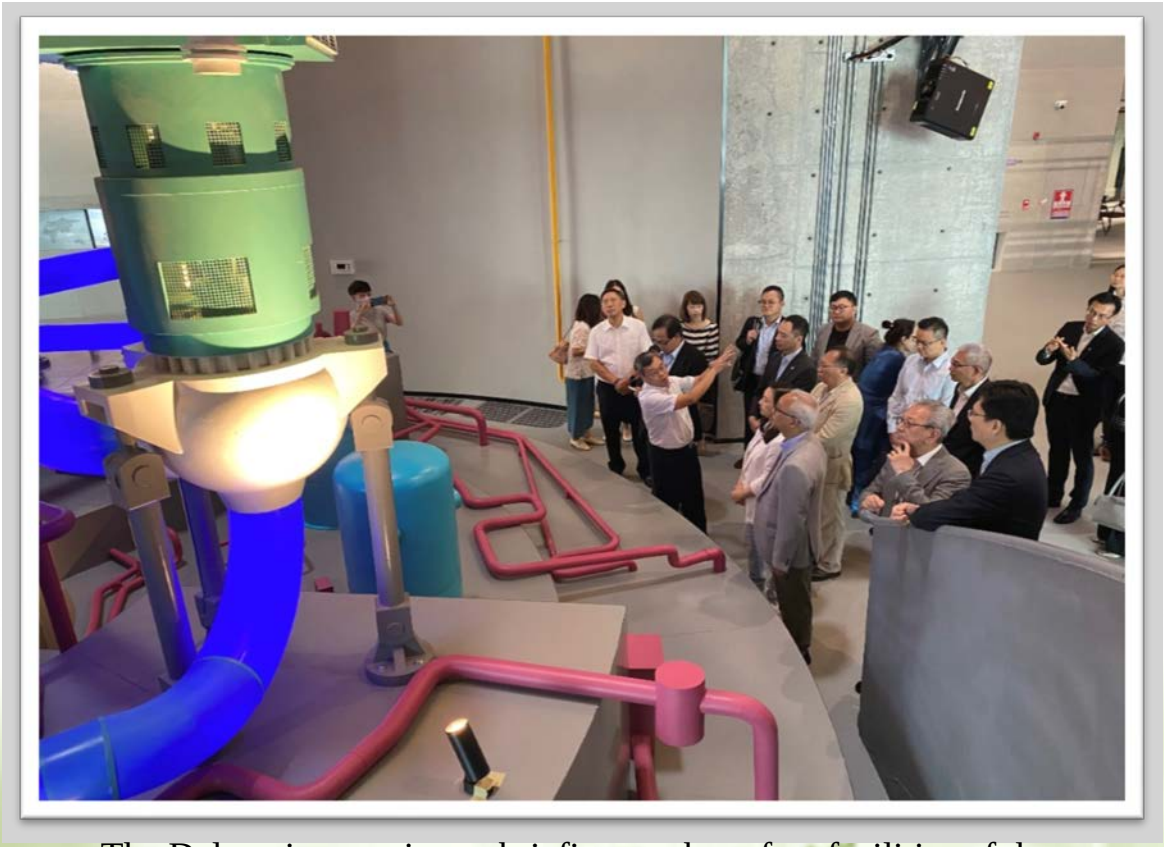
(c) Three safety barriers in the units: the first barrier is the fuel cladding, which encloses the radioactive material produced during nuclear fission and prevents it from escaping. The second is the reactor pressure vessel, which has a 20-mm-thick steel wall and is capable of enclosing cooling water containing a minute amount of radioactive material in the primary cooling circuit. Finally, there is the containment building which houses the reactor pressure vessel. Its 90-cm-thick reinforced concrete structure has a 6-mm-thick steel interior lining, making the containment building able to withstand the impact of a large commercial aircraft;

(d) Operational safety: All staff at the power station are required to undergo stringent training on nuclear safety and take requalification examinations every four years. The power station has also developed corresponding contingency plans in accordance with the International Atomic Energy Agency's four-category system for classifying nuclear emergencies. It also conducts regular training, internal comprehensive exercises and joint emergency exercises with the Guangdong authorities (at least once every five years); and

(e) Performance monitoring: The power station has a comprehensive programme in place to monitor radiation impact during operation both within the site and in the surrounding environment, as well as to safeguard the safety of staff inside the power station and the public. Such monitoring includes the capability factor (i.e. the generation ability at its full capacity in percentage), the accident rate for industrial safety, collective doses of the power station staff, radiation releases, volume of solid radioactive waste, environmental radiation monitoring, etc.

The Delegation receives a briefing by the personnel of the Daya Bay Nuclear Power Station on the layout of the plant units on the site

The Delegation visits the simulator units in the Daya Bay Nuclear Power Station



The Delegation receives a briefing on the safety facilities of the Daya Bay Nuclear Power Station

Nanshan Energy Eco-Park

4.13 The Delegation visited the Nanshan Energy Eco-Park in the Qianhai Free Trade Zone of Shenzhen on the afternoon of 9 August to gain an in-depth understanding of Shenzhen's experience in the planning, construction and operation of waste incineration treatment facilities for solving the problem of "rubbish encircling the city".

4.14 Nanshan Energy Eco-Park is one of the WtE power plants of Shenzhen Energy Environment Engineering Company Limited, with a total investment of RMB1.65 billion (approximately HK$1.8 billion). Covering an area of about 114 000 m^2, the Park is divided into two phases which came into operation in 2003 and 2019 respectively. Apart from enabling the Nanshan District to dispose of all its domestic waste by itself, the facility also treats some of the domestic waste from the Futian and Luohu Districts.

4.15 The Delegation observes that the Nanshan Energy Eco-Park is a multi-functional facility encompassing WtE conversion, popular science education, environmental publicity, scientific research and industrial tourism. Situated in close proximity to residential areas (less than 1 km in a straight line from the nearest residential area), the Eco-Park is one of the few waste incineration plants in the country without surrounding walls. As a demonstration of Shenzhen's innovative approach to domestic waste classification and treatment facility construction, the Eco-Park was recognized as one of the 47 recommended innovative initiatives and experiential practices in Shenzhen by the National Development and Reform Commission in 2021.

4.16 The Nanshan Energy Eco-Park embodies the design concept of de-industrialization by incorporating various elements into its architectural appearance, including ocean waves for the main plant, an arum lily for the chimney, and seashells for the science education base. In December 2021, the construction of the recycled art exhibition hall at the Eco-Park was completed. The exhibition hall is themed around the ocean and recycling, showcasing the processes of waste separation and recycling, as well as WtE incineration. The Eco-Park also offers interactive activities that combine education and entertainment for the public participation. For example, visitors can learn about waste classification through the sensor-based interactive game area. They can also experience a large projected underwater world in a submerged lecture theatre. Moreover, the Eco-Park includes facilities such as a science education exhibition hall, a gallery showcasing the process of waste incineration, an indoor heated swimming pool and a café. With these facilities, the Eco-Park can host various art exhibitions, environmental salons, industry exhibitions, forums and other activities.

4.17 The Delegation notes that the WtE incineration power plant in the Nanshan Energy Eco-Park adopts stringent air emission standards for incineration facilities. In 2017, the Shenzhen Municipality introduced the new Shenzhen Municipal Regulations for the Operation of Municipal Solid Waste Treatment Facilities, which tightens pollutant emission limits and requires air emission targets for waste incineration plants to meet or surpass the relevant national and European Union ("EU") standards. The dioxin emission targets for the waste incineration plant in the Nanshan Energy Eco-Park are only half of the national and EU standards.

4.18 At the Nanshan Energy Eco-Park, the post-incineration slag is transformed into eco-blocks and various metals are separated for recycling, forming a recycling industrial chain. Through efforts such as WtE incineration of domestic waste, treatment and reuse of leachate, and recycling of slag into eco-blocks, the Eco-Park contributes to the transformation of Shenzhen into a "zero-waste" city.

The Delegation receives a briefing from the representative of the Nanshan Energy Eco-Park on the park facilities

The Delegation learns about the development of the Nanshan Energy Eco-Park and its services

The Delegation visits the recycled art exhibition hall

Delegation members pose for a photo in front of an exhibit at the recycled art exhibition hall

The Delegation observes the real-time emission data of the Nanshan Energy Eco-Park

Chapter 5: Follow-up event in Hong Kong

5. After the visit to Mainland cities of GBA, the Delegation held a press conference in the Press Conference Room of the Legislative Council Complex on 18 August to brief the media on the contents of the visit, as well as the observations and experiences gained.

Chapter 6: Observations and conclusions

6.1 During the three-day duty visit, the Delegation visited facilities relating to new energy transport, hydrogen energy technologies, renewable energy and application of WtE technologies, and met with leaders of the Department of Ecology and Environment of Guangdong Province. This fruitful visit not only enabled Members to have a better understanding of the current state and development direction of the above areas, but also facilitated Members' discussion with the Administration on the relevant strategies and measures, with a view to enhancing and expediting Hong Kong's development in the above areas. Members' observations are detailed below.

New energy transport

Charging facilities for electric vehicles

6.2 During the visit, Members visited a number of EV charging facilities, including the Guangzhou Public Transport Group's liquid cooling ultra-fast charger, battery swapping station, integrated micro- PV storage and charging station, as well as Huawei's EV ultra-fast charging station. Members note that liquid cooling ultra-fast charger, with fast charging speed and light charging equipment, can resolve the heat-up and structural weight issues associated with increased power capacity.

6.3 Members observe that the Mainland cities visited have put in place quite a number of ultra-fast charging facilities for use by electric public transport vehicles or electric private cars and set relevant policy targets. In contrast, the existing public charging facilities in Hong Kong still mainly comprise standard and medium chargers; while quick charging facilities

are still under study, evaluation or planning.[2] On the other hand, the Administration rolled out a $3.5 billion "EV-charging at Home Subsidy Scheme" ("EHSS") in October 2020 to subsidize the installation of EV charging-enabling infrastructure in car parks of existing private residential buildings. Members express concern that EHSS, which does not cover car parks with more than 60% of parking spaces in open area, will in effect leave out a large number of stakeholders of single-block buildings. **Members suggest:**

(a) that Hong Kong should, by drawing reference from the technology and experience of the Mainland, expedite the upgrading of some public charging facilities to quick charging facilities, in particular the provision of quick charging facilities for high usage public transport vehicles (e.g. public light buses and franchised buses) at stations or public transport interchanges; and expedite the provision of a territory-wide quick charging network for commercial vehicles with no designated parking spaces (e.g. electric taxis);

(b) introducing ultra-fast charging technology for public charging facilities and set medium to long-term goals; and

(c) examining the eligibility for the "EV-charging at Home Subsidy Scheme" and considering whether it can be extended to cover car parks with more than 60% of parking spaces in open area.

[2] The Administration set out in the Hong Kong Roadmap on Popularisation of Electric Vehicles ("EV Roadmap") announced in February 2021 the goal to have at least 150 000 parking spaces in private residential and commercial buildings equipped with EV charging-enabling infrastructure before 2025. On public charging facilities, the Government allocated $120 million in 2019 to install over 1 000 medium chargers in 70 car parks open for public use. As at the end of December 2022, the Government and private organizations provided a total of about 5 434 public chargers, among which 2 210 were provided by the Government. The Administration plans to progressively upgrade some standard charging facilities to medium charging facilities, so as to enhance the cost-effectiveness of EV charging facilities. In addition, as announced in the Chief Executive's 2022 Policy Address, in the coming three years, the Government will provide an additional 7 000 parking spaces with EV charging facilities in government premises to be completed soon or just completed, while studying the conversion of some of them into quick charging facilities. On charging facilities for electric commercial vehicles, the Administration expects that 1 400 quick charging facilities can be provided in 2027 through various modes.

Cascade battery energy storage

6.4 Members understand that the country strongly supports the development of battery energy storage. The "Guiding Opinions on Accelerating the Development of New Energy Storage (Draft for Comments)" jointly issued by the National Development and Reform Commission and the National Energy Administration on 21 April 2021 proposed achieving the transformation from the initial stage of commercialization to large-scale development of new energy storage by 2025. Among these initiatives, the cascade battery energy storage station in Yanling new energy eco-industrial park of the Guangzhou Public Transport Group is the first energy storage project on cascade utilization of retired batteries of buses in the GBA transport system, with the advantages of low investment cost, long operation cycle and larger charge/discharge volume, which are conducive to promoting the high quality development of the new energy industry. **Members consider that:**

Hong Kong may apply the cascade battery energy storage technology to EV charging and the handling of retired batteries of new energy vehicles, so as to protect the ecological environment and enhance resource utilization, while promoting the healthy development of new energy transport.

Integrated photovoltaic storage and charging facilities

6.5 Members observe that the integrated PV storage and charging technology adopted in Mainland cities has reached a high level of maturity, and different PV storage and charging solutions for different settings/vehicle types have also been made available in the market. Not only can the integrated PV storage and charging mode address the challenge of insufficient distribution capacity at charging stations, but it can also reduce the use of conventional energy, mitigate pollutant gas emissions and enhance energy utilization. The storage system will allow full play of the functions of energy storage and optimized configuration to achieve valley-filling and peak-shaving, thereby further reducing charging costs and enabling emergency charging for new energy vehicles in off-grid mode in the event of power outage due to grid failure. When equipped with an energy management system, it can also allocate energy of each unit in the system according to the principle of optimization, performing the functions of equipment monitoring, energy statistical analysis, energy management, stored energy distribution, event alarms and report management. **Members consider that:**

the Administration should, in developing EV charging facilities, give more consideration to different options and modes (including the integrated PV storage and charging technology), pursue the development of the charging network in Hong Kong in a more forward-looking and diversified manner, and continuously take forward relevant scientific research projects.

Smart management of charging facilities

6.6 Members note that EV charging service providers will generally develop a charging data management platform for direct control of all charging stations and charging equipment, providing users with personalized recommendations of charging stations through advanced algorithms and data analytics, thereby facilitating fast and convenient charging. The platform is also equipped with multi-scenario real-time status monitoring and fault alert functions to ensure a safe and stable charging process for users. In addition, the platform can also assist service providers in managing and allocating charging equipment through smart analytics, which will in turn optimize business strategies.

6.7 The Government launched the "EV-Charging Easy" mobile application in June 2022 to facilitate EV drivers to locate available public chargers conveniently in real time. The application mainly provides information on EV chargers in government estates, covering about 1 600 chargers. The Administration will progressively expand the coverage of real-time information and has invited other public and private organizations to participate in "EV-Charging Easy". The Administration has also set out in the EV Roadmap that EV charging fees will be imposed in government car parks starting from 2025 to marketize EV charging services, so as to promote their sustainable development in the long run. **Members consider that:**

The Administration may, on the existing basis, draw further reference from the options available in the Mainland and other markets to enhance smart management of public charging facilities, in particular with regard to monitoring the utilization rate and faults of the facilities, and to make timely and demand-driven adjustments to the locations and network of charging facilities.

Hydrogen energy development

6.8 In face of the challenges brought by climate change, the world is making efforts to phase out fossil fuels and expedite energy transformation. The electrification of road transport is the mainstream development direction at present, and quite a number of manufacturers are also actively developing other forms of new energy transport, particularly hydrogen fuel cell EVs. Hydrogen fuel, which consumes only electricity and water with reduced environmental impact, is recognized worldwide as a clean energy source and preferred alternative to petroleum fuel for vehicles.

6.9 Members note that the country has set four basic principles for the medium and long-term plan for the development of the hydrogen energy industry: innovation leads, self-reliance and self-improvement; safety first, clean and low-carbon; market-led and government-guided; and prudent application and demonstration first. Foshan initiated hydrogen energy development in Nanhai as early as in 2009, and promulgated the Hydrogen Energy Industry Development Plan of Nanhai District of Foshan in 2020. A number of Mainland provinces and municipalities have also promulgated their own plans for the development of the hydrogen energy industry. The development of the hydrogen energy in Hong Kong is still under study.[3] **Members consider that**:

(a) the development of green and low-carbon hydrogen energy has become an international trend, which is also in line with national policies. The Administration should expedite the relevant studies for early planning and formulation of a legal framework for hydrogen energy. The experience of Foshan or other Mainland cities in hydrogen energy development may serve as a medium-term reference for Hong Kong;

[3] To keep up with the development trend and the demand for ancillary facilities for hydrogen fuel cell EVs, EEB is leading an inter-departmental working group to conduct risk assessments on hydrogen refilling stations, the arrangements of hydrogen supply, hydrogen fuel cell EVs on road, etc., as well as review relevant regulations, standards and technical guidelines, with a view to preparing for the establishment of a legal framework for the local use of hydrogen fuel.

(b) as hydrogen for refilling stations in Nanhai District and Foshan as a whole is currently sourced from surrounding regions such as Guangzhou, Jiangmen, Dongguan and Zhuhai, hydrogen sources have become a bottleneck issue for the development of the hydrogen energy industry in Nanhai District. The scarcity of land resources, tight land use planning indicators and high land use costs will pose significant constraints to the scaled development of the hydrogen energy industry, as well as difficulties in site selection for the development of infrastructural facilities such as hydrogen refilling stations and hydrogen plants. Hong Kong should learn from the challenges faced by the Mainland in hydrogen energy development for preemptive preparation, such as reserving land for such purposes as well as considering ways to promote a stable supply of hydrogen energy while enhancing the cost-effectiveness of hydrogen energy;

(c) as town gas contains up to 49% of hydrogen, from which hydrogen can also be extracted by technical means, Hong Kong may make use of town gas for the production of hydrogen and capitalize on the advantages of the existing territory-wide gas transmission network to design the layout for hydrogen energy development; and

(d) in the long run, the Administration should draw reference from the strategies of Foshan and other Mainland cities in promoting the transformation and application of outcomes of hydrogen energy technologies, and strengthen exchanges and collaboration between Hong Kong and the Mainland in hydrogen energy technologies.

Renewable energy

6.10 During the duty visit, Members toured quite a number of renewable energy-related technologies covering the PEDF technology (including the installation of PV power panels on the exterior of buildings) at the Huawei Digital Power AntoHill Headquarters, in addition to the integrated PV storage and charging facilities mentioned above. Members observe that with these installations, solar PV panels are no longer confined to the rooftops of buildings/village houses, thereby significantly increasing the number of solar-ready buildings and facilities with minimal visual impact on the façade of such buildings. As the glass façade of commercial buildings generally do not require high light transmittance, the use of thin-film solar PV glass panels in place of conventional glass curtain walls can generate electricity, while reducing the intensity of indoor lighting and achieving thermal insulation. **Members suggest that:**

Hong Kong may promote the PEDF technology for green buildings, particularly the installation of PV power panels on the exterior of buildings. In addition to glass windows or curtain walls of buildings in general, PV power panels can be installed on noise barriers along highways, as well as in shopping malls, stadiums, libraries, museums, MTR stations, airports, etc. The electricity generated can be sold to power companies or stored in batteries for lighting purposes in public spaces (e.g. corridors and lobbies) inside buildings.

Nuclear power generation

6.11 Since commissioning in 1994, DBNPS has been providing stable and reliable nuclear electricity supply to Hong Kong at a relatively low price. Nuclear electricity currently imported from DBNPS constituted about a third of the fuel mix of CLP Power Hong Kong Limited ("CLP"). The contract for supply of nuclear electricity from DBNPS will last until 2034. To ensure that more clean and cost-competitive energy is provided to Hong Kong, DBNPS has increased its nuclear supply to Hong Kong from 70% to around 80% of its total output from late 2014 to 2023. **Members consider that:**

the soaring fuel costs in the global market in recent years have led to significant increases in local electricity tariffs; with a more stable price than that of coal or natural gas, nuclear energy has helped smooth out fuel cost increases. Hong Kong may increase the share of nuclear energy in its fuel mix for electricity generation in order to serve a dual purpose of decarbonization and stabilizing tariff levels. In this regard, the Administration should discuss with relevant parties in the Mainland the supply of more nuclear electricity to Hong Kong.

Waste management

Zero waste Bay Area

6.12 Members note that in order to implement the Work Plan for the Pilot Program of "Zero-Waste City" Building issued by the General Council of the State Council in 2018, the Ministry of Ecology and Environment has arranged for various provinces (regions and municipalities) to recommend candidates for "zero waste cities", and

selected and determined cities under the pilot programme in conjunction with the relevant departments. At present, a number of Mainland cities with modern waste incineration plants have been promoting exchanges of experience and exploration of work approaches on issues such as reducing solid waste generation at source, transformation of waste into resources and harmless treatment, promoting urban green development and transformation, as well as enhancing the quality of urban ecological environment. In November 2021, in the Opinions of the CPC Central Committee and the State Council on Further Making Solid Gains in the Battle Against Pollution, the country proposed that provinces with appropriate conditions should be encouraged to take forward "zero-waste city" building across the board. **Members consider that:**

a holistic approach to pollution prevention and control in GBA can enhance the effectiveness of regional water quality, air quality, ecological and even waste management. Hence, Hong Kong and Mainland cities of GBA should continue to strengthen exchanges of technology and experience, and explore collaborative governance and capacity sharing. Hong Kong should also work with the Mainland and Macao to take forward the setting up of a working group on zero waste Bay Area, the establishment of an ecological and environmental protection mechanism among Guangdong, Hong Kong and Macao, etc.

Waste-to-energy facilities

6.13 Members note that all domestic waste in Shenzhen was treated by incineration instead of burial, and that the Nanshan Energy Eco-Park alone has a daily treatment capacity of 2 300 tonnes of domestic waste. At present, many advanced cities have achieved the transformation of waste into resources through modern waste incineration technology. The country has also made great efforts in developing WtE technology and reached a world-class level. In the Waste Blueprint for Hong Kong 2035 announced in February 2021 which set out the vision of "Waste Reduction • Resources circulation · Zero Landfill", the Environment Bureau outlined the strategies, goals and measures to tackle the challenge of waste management up to 2035, including developing WtE facilities. The first modern WtE incinerator (I • PARK1) in Hong Kong is expected to be completed by 2025. **Members consider that:**

(a) Hong Kong may, by drawing reference from the technology and planning options for the construction of waste incineration plants in the Mainland, expedite the development of such facilities locally, so as to achieve "Zero Landfill" as soon as possible;

(b) Hong Kong may discuss the feasibility of collaboration with the relevant Mainland authorities/enterprises, and jointly work out cooperation plans to tackle the waste problem in GBA by leveraging the advantage of GBA integration;

(c) The Nanshan Energy Eco-Park has showcased how advanced and efficient waste incineration facilities can be harmonized with neighbouring commercial and residential areas. The Administration may, by making reference to such design, optimize the functions of incineration facilities or even develop them into tourism hotspots, thereby turning such facilities from being "NIMBY" ("鄰避") to "YIMBY" ("鄰利") and maximizing synergy through co-location; and

(d) the Administration should step up publicity and explanatory efforts to facilitate public understanding of the technology and environmental benefits of modern incineration facilities, so as to allay the concerns of local residents about the environmental impact of such facilities.

Conclusions

6.14 Members consider the duty visit very fruitful and inspiring. The "energy tour" has enabled Members to gain an in-depth understanding of the application and development of new energy transport, hydrogen energy technology, renewable energy and WtE technology in Mainland cities of GBA, and have thorough exchanges of views with the local government officials and enterprises. The Mainland's relevant technologies and experience serve as valuable reference for Hong Kong in implementing the strategies of "net-zero electricity generation", "energy saving and green buildings", "green transport" and "waste reduction", as well as striving

towards the goal of achieving carbon neutrality. Members urge the Government to, by drawing on the relevant experience and technologies, continue to expand the EV charging network and enhance charging facilities; expedite the review of regulations and technologies relating to hydrogen energy to promote the use of hydrogen energy in Hong Kong; and expedite the development of modern incineration facilities to achieve "Zero Landfill" as early as possible. Hong Kong should also continue to foster its linkages and cooperation with Mainland cities of GBA to achieve complementarity of advantages, and address environmental protection and pollution issues through collaborative governance and capacity sharing.

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Appendix

List of Members of the Delegation of the Environment and Ecology Bureau

1. Mr TSE Chin-wan, BBS, JP, Secretary for Environment and Ecology, (Head of the delegation of the Environment and Ecology Bureau)
2. Mr José YAM, Principal Assistant Secretary for Environment and Ecology (Energy)
3. Mr Dragon LI, Political Assistant to Secretary for Environment and Ecology
4. Ms Fanny HUI, Press Secretary to Secretary for Environment and Ecology
5. Miss Miki CHAN, Assistant Secretary for Environment and Ecology (Energy)1
6. Mr Joe CHEUNG, Senior Executive Officer (Administration), Environment and Ecology Bureau

<u>The following officers only participated in part of the duty visit</u>

7. Dr Samuel CHUI, JP， Director of Environmental Protection, Environmental Protection Department
8. Mr Raymond WU, Deputy Director of Environmental Protection (2), Environmental Protection Department
9. Mr D C CHEUNG, Principal Assistant Secretary for Environment and Ecology (Sustainable Development), Environment and Ecology Bureau
10. Dr Sunny CHEUNG, Principal Environmental Protection Officer (Air Policy), Environment and Ecology Bureau
11. Mr Andy HO, Chief Electrical and Mechanical Engineer (Electricity Team), Environment and Ecology Bureau
12. Mr Billy LEUNG, Assistant Secretary for Environment and Ecology (Sustainable Development)1, Environment and Ecology Bureau
13. Miss LAM I-ching, Assistant Secretary for Environment and Ecology (Air Policy)1, Environment and Ecology Bureau
14. Dr Joanna KWAN, Senior Environmental Protection Officer (Infrastructure Planning)1, Environmental Protection Department
15. Mr Alan LAM, Assistant Environmental Protection Officer (Air Policy)12, Environment and Ecology Bureau
16. Mr Vincent FONG, Assistant Environmental Protection Officer (Air Policy)42, Environment and Ecology Bureau