

**For discussion on
11 May 2020**

**Legislative Council Panel on Environmental Affairs
Subcommittee to Study Issues Relating to the Development of
Electric Vehicles**

Promoting the Use of Electric Vehicles

Purpose

This paper briefs Members on the Government's overall strategy for promoting the use of electric vehicles (EVs).

The EV Development in Hong Kong and Related Strategies

2. Vehicular emission is one of the key air pollution sources. As EVs have no tailpipe emission and low carbon emission, the Government has been actively promoting the use of EVs. The main source of roadside pollution in Hong Kong comes from commercial vehicles, including public transport, lorries, etc. Their emitted respirable suspended particulates and nitrogen oxides account for 95% of the total emission of all vehicles in Hong Kong. Hence, to improve roadside air quality, the Government's ultimate goal is to promote the use of electric commercial vehicles (e-CVs). While the market starts to accept the use of the electric private cars (e-PCs) in recent years due to rapid technological advancement, it takes time for further development of the technologies of e-CVs before their wider use. As the technologies in e-PCs are more advanced than that in the e-CVs, their policy support required are not the same.

3. The policy to promote the use of EVs must tally with the technological development, market supply and competitiveness of EVs, as well as the social acceptance. To advance with the times, the EV policies have been evolving in accordance with these factors in the following three major stages.

4. The first stage was from mid-1990s to around late 2000s. At that period of time, EVs were still in early stage of technological research and development and the market supplied mainly models for trials with basically no mass production. In view of the above, the Government's then policy on EV was forward looking which aimed to encourage the development of EV technologies.

To this end, the Government has waived the first registration tax (FRT) for EVs since April 1994 and extended such arrangement for multiple times in order to lower the cost of trying out EVs and promote the technological development of EVs.

5. In late 2000s, the development of EVs entered into the second stage with the supply of mass production of EVs in the market. However, the driving range and performance of EVs could not match that of the conventional petrol PCs due to the immaturity of the overall EV technology. Many users reflected that they were only able to make limited use of e-PCs and the e-PCs could hardly replace conventional petrol PCs. Under the circumstances, the Government continued to promote the technological development of EVs by waiving FRT on EVs. On the other hand, the Government noticed that the technology of e-PCs had started to develop rapidly and would very likely become more mature in the future. Since charging network supporting wide adoption of EVs takes time to construct and it would be extraordinarily difficult to add charging facilities after the completion of the building construction, the Government must plan ahead. In this connection, the Government set up a Steering Committee led by the Financial Secretary in 2009 to coordinate the strategies for promoting EVs and study the feasibility of installing charging facilities in the Government multi-storey car parks. In 2011, the Government amended the *Hong Kong Planning Standards and Guidelines*, updated the guidelines on the design of new government buildings and offered gross floor area (GFA) concession for car parks in new developments in order to require and encourage the provision of such facilities in preparation of the extensive use of EVs in the future. The Government also set up the Pilot Green Transport Fund in March 2011 to encourage the public transport sector to try out green innovative transport technologies, and step up its effort to promote EV's technological development, in particular that on e-CVs.

6. Starting from around 2014, the development of EVs has entered into the third stage. EVs that are more technically mature with longer driving range have become gradually available in the market. Their prices are also more and more comparable to conventional PCs. As the number of the models of e-PCs is on the rise and EVs begin to receive wider market acceptance, the pace in the growth in the number of EVs has noticeably picked up. That said, popularisation of e-PCs requires mass supply of affordable models. The policy of full exemption of FRT, however, tilted in favour of high-priced e-PCs and undermined the popularisation of a wide range of EV models. In fact, many places across the globe are reducing or withdrawing their subsidies on e-PCs in order to facilitate the introduction of more affordable e-PCs by vehicle manufacturers. On the other hand, the number of PCs in Hong Kong increases continuously. In view of this, the Government introduced a revised FRT concession with an upper limit and the 'One-for-One Replacement' scheme to ensure the policy will not be inclined to high-priced

e-PCs and could contain the increase in PCs after reviewing the arrangement of FRT for EVs in 2017 and 2018.

7. As regards the promotion of the use of EVs, Hong Kong has become one of the leading cities in Asia. On the ratio of e-PCs to PCs, Mainland cities including Beijing, Hangzhou and Tianjin have the highest ratios among the major Asian cities, reaching about 2-4%. They are followed by Hong Kong (close to 2%) and Tokyo (1.3%). The ratios of other cities of the same year (2018) are: Seoul (0.3%), Singapore (0.1%) and Taipei (less than 0.1%). The number of e-PCs in Hong Kong has grown from 70 in 2010 to 13 890 at the end of February 2020, representing about 2.2% of the total number of PCs. The total number of EVs is 14 278, representing about 1.6% of the total number of vehicles in Hong Kong.

8. As the e-PC technologies have become mature, more and more affordable e-PC models with longer driving range have entered into the local market. The ensuing paragraphs set out the Government's various policies and measures to promote the use of EVs on a sustainable basis.

Promoting the Use of EV

First registration tax concessions and other financial incentives

9. To promote the use of EVs instead of conventional fuel-propelled vehicles, the Government has been waiving in full the FRT for electric commercial vehicles. E-PCs currently enjoy a FRT concession up to \$97,500. To strike a balance between promoting wider use of e-PCs and not increasing the overall number of PCs, the Government also introduced the 'One-for-One Replacement' Scheme. Under the Scheme, purchasers of e-PCs who scrap and de-register their eligible old PCs and then first register a new e-PC can enjoy a higher FRT concession of up to \$250,000.

10. Since the introduction of the Scheme from February 2018 until the end of March 2020, 3 372 applications were approved, of which 3 309 have completed first registration. More than 85% of the first registered e-PCs have benefitted from the Scheme, and this percentage further increased to more than 90% in the past six months.

11. Besides, enterprises which procure EVs are allowed full profits tax deduction for the capital expenditures on the vehicles in the first year of procurement. Annual vehicle licence fees for e-PCs are also significantly lower than that for conventional PCs.

Promoting electric public transport

12. The operational modes of various types of public transport in Hong Kong are relatively unique. For example, more than 90% of the franchised buses are double-deck buses. Taxis have long operation hours and very high mileage. Public light buses (PLBs) are only available in Hong Kong. Application of various electric transport in Hong Kong encounters more challenges than other countries, including the need to cope with Hong Kong's hilly terrain feature and provide air-conditioning in different seasons, as well as the lack of land and space for installation of charging facilities, resembling the public bus charging terminals in Shenzhen. Therefore, while we need to actively make reference to overseas experience, we cannot strictly follow foreign approaches without local adaptation. We need to explore and conduct trials to establish technical requirements that suit local conditions, so as to promote electric public transport that are suitable for Hong Kong in the future.

Electric buses

13. The Government has fully subsidised the franchised bus companies (FBCs) to purchase 36 single-deck electric buses for conducting a two-year trial to test out their operational performance, reliability and economic feasibility in local conditions. At present, 33 electric buses have commenced operation. The remaining three electric buses are expected to commence operation in 2020.

14. Currently, the technology of double-deck electric buses is still developing and there are very few models available in the international arena. We will closely monitor the technology development of double-deck electric buses around the world. We will also continue to monitor the performance of single-deck electric buses under the trial, and collect and analyse the trial data. Upon completion of the trials, the Government will consider the way forward to encourage FBCs in using more electric buses, taking into account the affordability of the FBCs and passengers.

Electric public light buses (e-PLBs)

15. The Government has earmarked \$80 million to launch a pilot scheme for e-PLBs that subsidises about 40 e-PLBs running on various routes for a trial for 12 months. Green PLBs will be the major participants in the pilot scheme as they are running on relatively short routes, requiring a relatively lower driving range and charging power. Since they are running on fixed routes, the daily operation of e-PLBs can be supported by installing charging facilities at the PLB termini, public transport interchanges or other designated places where they operate. We expect to try out e-PLBs and charging facilities from different suppliers, so as to

test their operations under local environment and compare their performances. The Panel on Environmental Affairs of the Legislative Council (LegCo) was consulted on the details of the pilot scheme in January 2020¹.

Electric taxis

16. Under general operational mode, taxis are being operated daily for more than 20 hours and over 500 km in mileage. Suitable electric taxis models and the establishment of a quick charging network for drivers to charge in time are both required for the promotion of electric taxis in Hong Kong. The Government has commissioned a consultant in October 2019 to look for suitable sites for setting up quick charging stations in various districts of Hong Kong, and will continue to encourage suppliers to introduce more electric taxi models that suit local use. We understand that some taxi operators are also looking for electric taxi models that suit the operation needs of the market, in preparation for the trial of electric taxis in the future.

New Energy Transport Fund

17. The Government has put in place the Pilot Green Transport Fund in March 2011 to encourage the transport sector to try out green innovative transport technologies. As at the end of March 2020, the Fund has approved 183 trial applications, including 110 on electric commercial vehicles, 65 on hybrid commercial vehicles and eight on technologies applicable to conventional buses or ferries, with a total subsidy of about \$154 million.

Enhancing EV Charging Infrastructure and Networks

18. As regards EV charging, in view of the recent increase in driving range of EVs in the market, it is the Government's policy direction that EV owners should charge their EVs at home, workplace or other suitable places. The public charging network serves to provide top-up charging in the case of occasional needs while on the road. If EV owners can perform routine charging of their EVs at home or workplace, and can find public charging facilities to charge their EVs when necessary, car owners' worries in purchasing and operating EVs will be eased. In this connection, to facilitate the popularisation of e-PCs, it is essential

¹ Please refer to LegCo Paper No. CB(1)336/19-20(04).

to both promote installation of EV charging facilities in private residential buildings and enhance the public charging network.

19. In view of the rapid development in EV technology, and that governments of different countries are promoting new energy vehicles, it is anticipated that e-PCs may very likely become the main stream of new vehicle supply 20 years later. The world's leading countries in promoting EVs, including China, the Netherlands, Norway, Sweden, and the United States, have been actively expanding their charging networks and infrastructure.

20. In the light of land scarcity and dense population in Hong Kong, establishing charging network has proven to be more challenging than other places. A set of policies that suits local conditions is required. We have to introduce forward-looking initiatives to enhance our EV charging infrastructure so as to avoid Hong Kong to suffer from a lack of the required infrastructure to support wider use of EVs in the future. The Government's current major initiatives are as follows:

Charging facilities in private buildings

Concessions on GFA

21. The Government has required since April 2011 that only underground car parks in new private buildings provided with EV charging-enabling infrastructure (including provision of sufficient power supply, cabling and conduits for all parking spaces etc.) at each parking space can be fully exempted from the GFA calculations. The key objective of the policy is to enable owners of parking spaces to install chargers at their parking spaces and arrange for power connection according to their needs without any constraints in respect of power supply capacity of the buildings, or cabling and conduits of the car parks, etc.

22. For new developments approved from April 2011 to December 2019, over 80% of private parking spaces, involving about 540 car parks, will be provided with EV charging-enabling infrastructure. Upon completion of these developments, 65 000 parking spaces will be EV charging-enabling. The Government is examining the requirements for EV charging-enabling infrastructure under the *Technical Guidelines for Electric Vehicle Charging-enabling for Car Parks of New Building Developments*, with a view to refining the policy of encouraging the installation and addition of EV charging facilities,

and keep pace with market developments.

Subsidising installation of charging-enabling infrastructure in car parks of existing private residential buildings

23. The Government is preparing for a \$2 billion pilot scheme to subsidise installation of EV charging-enabling infrastructure in car parks of existing private residential buildings. The pilot scheme will prepare these buildings with EV charging-enabling infrastructure in order to tie in with the development of EVs in Hong Kong and the world as a whole.

24. Some individual EV owners cannot charge their EVs at home, as owners of parking spaces in existing private residential buildings often find it difficult to reach consensus with owners' corporations on installation works of charging facilities and sharing of the associated costs. The pilot scheme would assist car parks in existing private residential buildings to overcome the technical and financial difficulties often encountered in installation of charging-enabling infrastructure, and enable owners of individual parking spaces to install chargers according to their own needs in future. The Government has consulted the LegCo Panel on Environmental Affairs about the details of the pilot scheme in December 2019². We plan to launch the pilot scheme in the second half of 2020, which will cover roughly 60 000 private parking spaces in about 3 years.

Enhancing public charging network

25. A total of 857 government public chargers are currently provided at government car parks, most of which are medium chargers. The Government allocated \$120 million last year for extending the public EV charging network at government car parks in the coming 3 years, including installation of additional medium chargers at the car parks managed by the Transport Department, the Government Property Agency, the Leisure and Cultural Services Department and the Tourism Commission which are open to the public. Over 1 000 additional public chargers are expected to be in place by 2022, bringing the total number of chargers to about 1 800. The number and distribution of the additional chargers are at **Annex 1**.

26. The Government not only takes the lead in providing and enhancing its

² Please refer to LegCo Paper No. CB(1)233/19-20(05).

public charging facilities at government car parks, but also encourages other organisations, including the MTR Corporation Limited, the Hong Kong Housing Society and the Link REIT, etc., to set up and enhance public charging facilities at their car parks. As at the end of 2019, the non-government sector is providing 2 072 chargers which are open for public use, making a total of 2 929 chargers open to the public. The distribution of these chargers is at **Annex 2**.

On-street parking spaces with charging facilities and public quick charging stations

27. Provision of on-street parking spaces mainly caters for short-term parking needs, and such spaces are usually installed with parking meters to accelerate the turnover of parking spaces for use by more drivers. Taking into account relevant considerations including the power supply and space constraints, potential impact on nearby traffic, as well as other drivers' parking needs, the Government has to look for suitable on-street parking spaces to install charging facilities. The Government has preliminarily identified around 10 possible sites for such installation and is assessing the feasibility in detail. When these sites are confirmed to be suitable for installing on-street charging facilities, the Government will consider commencing a pilot scheme for charging facilities installation.

28. In addition, as mentioned in paragraph 16 above, the Government has commissioned a consultancy study in October 2019 to look for suitable sites for setting up public quick charging stations in various districts of Hong Kong. Upon the completion of the study, we shall explore a suitable proposal for the development of quick charging stations.

Proper Disposal of Waste EV Batteries

29. Waste EV batteries have to be properly handled under the Waste Disposal Ordinance (Cap. 354) and its subsidiary Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C). Most EV manufacturers or agents have currently engaged licensed collectors to collect the waste batteries of their brands' EVs. After proper preliminary treatment (e.g. sorting, discharging and insulating) and packaging, these waste EV batteries are exported to appropriate treatment facilities in Japan, Korea or Belgium for recycling. Although the age of most EVs in Hong Kong remains young and the number of retired EV batteries remains

small at this stage, as EVs will become more popular in future, the Environmental Protection Department (EPD) is embarking on a study on how to promote recycling of new energy vehicles batteries. Apart from analysing overseas experiences, the EPD has been maintaining close liaison with the trade and EV suppliers to explore solutions that are applicable to local situation, so as to enhance environmental protection.

Training of EV Mechanics

30. The Vocational Training Council (VTC) currently offers a number of in-service training programmes and two full-time programmes related to automobile maintenance, including the Higher Diploma in Automotive Engineering and Diploma of Vocational Education (Automotive Technology). The two full-time programmes are expected to provide more than 260 training places in total in the 2020/21 academic year. The VTC has embedded professional knowledge relevant to EV in the pre-employment programmes relevant to the automobile industry at various levels, such as design, operational modes, safety standards, and maintenance skills. The VTC will suitably update the relevant programme curricula having regard to the development of EV-related technology and industry demands. We will continue to collaborate with the VTC and relevant stakeholders to encourage EV suppliers and maintenance sector to share relevant information on the maintenance of EV, with a view to strengthening related training.

Way Forward

31. The Financial Secretary announced in the 2020-21 Budget that the Government would update the Clean Air Plan and formulate Hong Kong's first roadmap on the popularisation of EVs. The Government is actively preparing for relevant work, and will further examine the measures to improve air quality, as well as the policy objectives and plans to promote the use of EVs and their associated supporting measures. The relevant work is tentatively scheduled for completion in the first half of 2021.

32. When formulating policies on promoting the use of EVs and implementing different measures, the Government will, as in the past, consult and

listen to the views from various stakeholders of the trades and the general public through different channels with a view to refining the proposed policies. The Government will also actively study overseas experience and carefully examine the feasibility of applying such experiences to the local environment of Hong Kong.

Environment Bureau/Environmental Protection Department
May 2020

Annex 1

The number and distribution of EV chargers planned to be installed by the Government

Department	District		Location	No. of EV chargers to be installed
Transport Department	Southern	1.	Aberdeen Car Park	About 650 in total
	Central & Western	2.	Kennedy Town Car Park	
		3.	Rumsey Street Car Park	
	Kwai Tsing	4.	Kwai Fong Car Park	
	Eastern	5.	Shau Kei Wan Car Park	
	Wong Tai Sin	6.	Sheung Fung Street Car Park	
	Wan Chai	7.	Tin Hau Car Park	
	Tsuen Wan	8.	Tsuen Wan Car Park	
Government Property Agency	Eastern	9.	North Point Government Offices	About 200 in total
	Central & Western	10.	Queensway Government Offices	
	Sha Tin	11.	Sha Tin Government Offices	
	North	12.	North District Government Offices	
	Tuen Mun	13.	Tuen Mun Government Offices	
	Sai Kung	14.	Sai Kung Government Offices	
	Sham Shui Po	15.	Cheung Sha Wan Government Offices	
	Kowloon City	16.	Trade and Industry Tower	
Leisure and Cultural Services Department	Central & Western	17.	Sun Yat Sen Memorial Park	About 310 in total
		18.	Sun Yat Sen Memorial Park Sports Centre	
	Eastern	19.	Siu Sai Wan Sports Ground	
		20.	Island East Sports Centre	
	Southern	21.	Deep Water Bay Beach	
		22.	Ap Lei Chau Waterfront Promenade	
	Wan Chai	23.	Wong Nai Chung Gap	

Department	District		Location	No. of EV chargers to be installed
			Children's Playground	
	Kwun Tong	24.	Kowloon Bay Park	
		25.	Ping Shek Playground	
		26.	Shun Lee Tsuen Park	
		27.	Lei Yue Mun Municipal Services Building	
	Sham Shui Po	28.	Lai Chi Kok Park	
		29.	Sham Shui Po Sports Ground	
		30.	Cornwall Street Park	
		31.	Lung Cheung Road Lookout	
	Wong Tai Sin	32.	Hammer Hill Road Sports Ground	
		33.	Po Kong Village Road Park	
	Yau Tsim Mong	34.	Kowloon Park	
	Islands	35.	Tung Chung Municipal Services Building	
	Kwai Tsing	36.	Tsing Yi Southwest Leisure Building	
		37.	Tsing Yi Northeast Park	
		38.	Tsing Yi Sports Ground and Swimming Pool	
		39.	Kwai Chung Sports Ground	
		40.	Hing Fong Road Playground	
	North	41.	Sheung Shui Swimming Pool	
		42.	North District Sports Ground	
		43.	Wo Hing Sports Centre	
		44.	Po Wing Road Sports Centre	
		45.	Fanling Swimming Pool	
	Sai Kung	46.	Tseung Kwan O Swimming Pool	
		47.	Tseung Kwan O Sports Ground	

Department	District		Location	No. of EV chargers to be installed
		48.	Tiu Keng Leng Sports Centre	
	Sha Tin	49.	Siu Lek Yuen Road Playground	
		50.	Sha Tin Sports Ground and Yuen Wo Playground	
		51.	Sha Tin Jockey Club Swimming Pool and Yuen Wo Road Sports Centre	
		52.	Sha Tin Town Hall	
		53.	Hong Kong Heritage Museum	
		54.	Ma On Shan Swimming Pool	
		55.	Ma On Shan Sports Ground	
		56.	Yuen Chau Kok Complex	
	Tai Po	57.	Tai Po Sports Ground	
		58.	Tai Po Complex	
		59.	Kwong Fuk Park	
	Tsuen Wan	60.	Shing Mun Valley Swimming Pool	
		61.	Shing Mun Valley Sports Ground	
	Tuen Mun	62.	Tuen Mun North West Swimming Pool	
		63.	Tuen Mun Swimming Pool	
		64.	Yau Oi Sports Centre	
	Yuen Long	65.	Yuen Long Swimming Pool	
		66.	Tin Shui Wai Swimming Pool & Tin Shui Wai Sports Centre	
		67.	Tin Shui Wai Sports Ground	
68.		Tin Yip Road Park		
69.		Fung Kam Street Sports Centre		
Tourism Commission	Kowloon City	70.	Kai Tak Cruise Terminal	About 40 in total

Remark: The number of EV chargers listed in the table is a preliminary estimate and the actual number will be affected by factors such as available electricity at venues, availability of venues and other restrictions.

**The numbers of public EV chargers opened for public use with a
breakdown by the 18 districts of Hong Kong
(as at the end of 2019)**

District	No. of Public Chargers			Sub-total
	Standard	Medium	Quick	
Central and Western	62	110	38	210
Eastern	28	67	54	149
Southern	4	12	29	45
Wan Chai	66	121	37	224
Kowloon City	64	7	15	86
Kwun Tong	551	181	62	794
Sham Shui Po	17	104	71	192
Wong Tai Sin	24	46	11	81
Yau Tsim Mong	110	124	68	302
Kwai Tsing	25	13	33	71
Tsuen Wan	17	49	12	78
Sai Kung	24	37	27	88
North	58	25	12	95
Tai Po	28	3	7	38
Sha Tin	75	51	48	174
Yuen Long	50	33	18	101
Tuen Mun	12	10	19	41
Islands	18	115	27	160
Total	1233	1108	588	2929