



Research Office
Legislative Council Secretariat

Fact Sheet

Policies and measures on promoting the use of electric vehicles in selected places

FS01/19-20

1. Introduction

1.1 Battery electric vehicles ("EVs")¹ are considered a preferable choice to conventional petrol and diesel cars when it comes to environmental protection. EVs have no tailpipe emissions of air pollutants, and are more energy efficient and less noisy than conventional cars. As such, there has been growing investment and promotion of EVs around the globe in the past few decades. Hong Kong began to promote the use of EVs as early as in 1994, through primarily tax incentives. At present, the penetration of EVs is about 1.6% in Hong Kong. There are views that the Government should accelerate the efforts to push forward the transition to low carbon transport through a greater use of EVs. Previously, the Office of The Ombudsman has released an investigation report, recommending the Government to set a clear policy and practicable measures with specific targets so as to motivate various stakeholders (e.g. the automotive sector and vehicle owners) to offer their support.²

1.2 At its meeting on 12 June 2020, the Subcommittee to Study Issues Relating to the Development of Electric Vehicles will discuss issues relating to the setting of development targets and formulation of policy measures for Hong Kong. At the request of the Subcommittee, the Research Office has completed a study on the strategy to promote the use of EVs in selected places. Four neighbouring cities, namely Seoul, Shenzhen, Singapore and Tokyo, are studied as they share similar socio-economic characteristics with Hong Kong. In addition, two western places, California of the United States

¹ EVs generally refer to cars or other vehicles with motors that are powered purely by electricity. In some jurisdictions, EVs also cover those vehicles powered by a combination of fuel and electricity with rechargeable batteries (i.e. plug-in hybrid EVs) and those powered by fuel cell instead of battery (i.e. fuel cell EVs). In this fact sheet, unless otherwise stated, EVs refer to battery-powered EVs.

² See Office of The Ombudsman (2019).

and Norway are also studied since both of them are the frontrunners in promoting environmental protection through supporting a greater use of zero-emission vehicles.

1.3 This fact sheet will begin with an overview on the major policy or strategy adopted in Hong Kong and other selected places in driving EVs adoption, followed by a summary on the government initiatives or support on various aspects which are commonly considered to be the key considerations in adopting EVs, including support to (a) EV purchase, (b) EV operation (c) charging infrastructure, and (d) targeted segments. Major features of the policy measures in Hong Kong and the six selected places are highlighted in the **Tables 1-5**.

2. Overview on major EV policies and measures in selected places

2.1 Promoting the use of EVs is a global trend. Among the many places, **Norway** is recognized as the global leader in EV promotion. Its first EV policy was introduced back in 1989, with concerted efforts over the years to boost EV production, reduce the operation cost, and increase the convenience for using EVs. Besides EVs, plug-in hybrid EVs (i.e. a combination of fuel and electricity with rechargeable batteries) are also common in Norway. At present, there are 272 051 EVs and 116 147 plug-in hybrid EVs. Approximately, one in 10 vehicles in Norway is either EVs/plug-in hybrid EVs.

2.2 Though there is a relatively high uptick of EVs and hybrid vehicles, there are just about 15 000 public chargers in Norway, and reportedly EV drivers commonly recharge their cars at home. Since public charging supply is in shortage, there have been calls for expanding the facilities.³ Nevertheless, as a frontrunner in promoting climate protection, Norway has set an aggressive goal that all new passenger cars and light vans sold by 2025 should be zero-emission vehicles (e.g. electric or fuel cell).⁴ In **California**, it is also an early starter in promoting EVs, thanks to its zero-emission vehicle programme introduced decades ago. Presently it has about 253 430 EVs and 216 042 plug-in hybrid EVs. Like Norway, it has established an aggressive goal of having 1.5 million zero-emission vehicles⁵ on

³ See The Driven (2019).

⁴ See Ministry of Transport (2019).

⁵ Under the Zero-Emission Vehicle regulation in California, apart from EVs and fuel cell EVs, plug-in hybrid EVs are also considered as zero-emission vehicles.

roads by 2025, with the building of 250 000 public and private charging stations, including 10 000 direct-current fast chargers.

2.3 Asian cities, however, appears less aggressive in their EV development. In **Hong Kong**, the Government started promoting the use of EVs in the 1990s using mainly tax incentives. Today, there are about 14 300 EVs in Hong Kong, representing 1.6% of all vehicles and most of them are electric private cars.⁶ The adoption is considered not high and one of the constraints is believed to be the inadequacies in ancillary facilities.⁷ Furthermore, at present, there is no specific target for EV development. The Hong Kong Planning and Standards Guidelines states that "the Government's longer term target is that as far as private cars are concerned, 30% are EVs or hybrid by 2020". However, the Government has clarified that it is simply a vision. Not until recently, the Government has said that it would engage stakeholders to formulate Hong Kong's first EV roadmap, covering different kinds of vehicles.⁸

2.4 Despite that the EV penetration in the neighbouring cities of **Seoul, Singapore and Tokyo** is lower than that of Hong Kong (**Table 1**), these places have recently strengthened the promotion efforts with the launch of a development target in some form or others to catch up the development. For instance, Seoul's target is to have about 80 000 EVs in the city by 2022;⁹ and Singapore has announced that it would expand the EV infrastructure and by 2030, 28 000 chargers would be available at public car parks.¹⁰ In **Shenzhen**, its rapid development in electric buses and taxis in recent years has attracted global attention. At present, all buses and taxis in operation are already in electric mode, under the support of strong government subsidies and/or innovative purchase/operating arrangements.¹¹ Shenzhen has further set a target that in 2020, at least 95% of vehicles newly procured for replacement of the old by the government and public organizations

⁶ About 97% are electric private cars. There is no published figure on plug-in hybrid EVs. They are counted towards the number of registered petrol or diesel vehicles according to the fuel used.

⁷ See Office of The Ombudsman (2019).

⁸ See GovHK (2020a).

⁹ See Seoul Metropolitan Government (2020a).

¹⁰ See Government of Singapore (2020).

¹¹ See 深圳市福田區發展和改革局：《2019 年-關於推進實施停車充電一體化 "智能立體車庫"民生工程，建設智慧幸福福田的建議》(2019) and 深圳市龍崗區人民政府(2019).

should be EVs.¹² The ensuing paragraphs discuss the major features of the policy in the selected places.

3. Promoting the use of electric vehicles in selected places

Major financial incentives for purchasing/switching to EVs

3.1 Providing attractive financial incentives at the point of sale is always the most direct way to encourage people to adopt EVs. As such, it is very common to impose **tax reduction/exemption** measures on purchasing EVs (**Table 2**). In Hong Kong, under the current policy, the first registration tax ("purchase tax")¹³ is exempted fully for electric commercial vehicles. For electric private cars, there is a tax cap of HK\$97,500 generally. A higher cap of HK\$250,000 is provided under the "One-for-One Replacement" scheme, through which purchasers scrap and de-register their eligible old private cars, and then first register a new electric one. In both **Tokyo** and **Norway**, full purchase tax exemption is provided for electric private cars while conventional cars with better environmental performance (e.g. lower emission level) may also enjoy tax exemption or lower tax rate.¹⁴ In Norway, its purchase tax exemption, coupled with value-added tax exemption (25% of selling price), has made an EV even **cheaper** to buy than those petrol vehicles with similar models.¹⁵ This might probably explain partly the relative high market share of EV in that place. In 2019, 42% of new car sales in Norway are battery powered.

3.2 Apart from tax relief measures on purchasing EVs, some places also provide financial support in form of purchase cost subsidies/rebates. For instance, in **Seoul**, apart from the tax cut, there is a subsidy ranging from 10.55 million won (HK\$70,685) to 12.7 million won (HK\$85,090) (depend on the vehicle model) for purchasing an electric private car. A similar incentive is also seen in Tokyo but the level of purchase subsidy is lower (HK\$21,570). To make EVs more affordable, there is even **increased rebate** in **California** for low-income families. At present, Hong Kong does not provide financial

¹² See 深圳市生態環境局 (2020).

¹³ The tax imposed at the point of EV purchase in the selected places is in a different name and/or for a different charging purpose. For the purpose of this fact sheet, such tax is referred to as purchase tax.

¹⁴ See Ministry of Internal Affairs and Communications (2019) and Norsk elbilforening (2020).

¹⁵ See Norsk elbilforening (2020).

subsidies for electric private car purchase, which might partly be due to its transport policy that members of the public are encouraged to use public transport.

Specific support for switching to electric public transport vehicles

3.3 On **public transport vehicles**, Hong Kong has subsidized bus operators to purchase 36 electric buses for pilot running. **Shenzhen** has taken a much more aggressive approach in driving the adoption of electric buses. Its government has notably provided about RMB200,000 (HK\$226,600) to RMB400,000 (HK\$453,300) per bus annually as operation subsidies until 2017 and bus operators were free to adopt their own way to accelerate the adoption. For instance, two bus companies have opted for the model of "混合租賃", under which the car production company has sold the electric buses and charging facilities to a third-party financial institution, which then leases the equipment to the bus companies for an eight-year period, after which the asset ownership will then be transferred to the bus companies.¹⁶

3.4 Meanwhile, another bus company has adopted the "整車購買，服務外包" model by entering an agreement with the car production company on bus fleet purchase, while outsourcing the provision of necessary charging facilities and services to an electricity charging service provider. Their different business models adopted have resulted in quick conversion of over 16 000 conventional buses into electric buses in several years. Since late 2017, the government has turned more focus to the taxi sector. It has provided taxi operators with a purchase grant of RMB164,800 (HK\$186,751), along with an early adoption incentive of up to RMB32,000 (HK\$36,262) for conversion of each petrol taxi into electric taxi. Probably driven by heavy subsidies, all 21 000 taxis in the city are now electric powered.¹⁷

¹⁶ During the lease period, the car production company is responsible for bus and charging equipment maintenance. See 人民網(2017) and 新華網：《"混合所有制"助力深圳公交純電動化》(2018).

¹⁷ See 深圳市史志辦公室(2020).

Major incentives to reduce EV operating cost and enhance driving convenience

3.5 In view that the operating cost of EVs is a consideration to car owners, all places studied offer **fee benefits** in some form or others to reduce the driving cost of EVs (**Table 3**). In Hong Kong, reduction in annual vehicle licence fees for EVs is a major form of reducing operating cost.¹⁸ Yet cost of electricity charging might still be a long-term concern of some people, although charging services are currently free at government car parks,¹⁹ and fee waiver is provided at some charging stations provided by private companies (e.g. the two power companies). To enhance price certainty, **Shenzhen** has set a **price ceiling** of RMB0.8 (HK\$0.9) per kWh for charging EVs since July 2018, applicable to both public and private charging facilities.²⁰ Apart from capping the electricity price, it is noted that some other places (e.g. **California and Norway**) offer **exempted/reduced parking fee** and/or **toll fee** as an incentive to EV drivers.

3.6 Apart from the above fee benefits, some places have implemented pro-EV measures on roads (often known as road privileges) to provide a greater convenience in driving. For instance, EV drivers in **Norway** can drive on most of the **bus/taxi lanes**.²¹ Likewise in **California**, EV drivers can drive on the **high-occupancy vehicle lanes**.²² In addition, to ensure that the charging facilities are accessible by EV drivers when needed, the law in California even provides that a vehicle parking at a private/public off-street parking facility could be **towed away** if it is not connected for charging purpose.

¹⁸ The annual vehicle licence fees for electric private cars range from about HK\$600 to HK\$1,100, which are significantly lower than those for conventional private cars ranging from HK\$3,815 to HK\$12,675. See Legislative Council Secretariat (2020).

¹⁹ It is indicated in the Ombudsman report that the Government intends to charge a fee for public charging service in the long run. See Office of The Ombudsman (2019).

²⁰ See 深圳市福田區發展和改革局：《2019年-關於緩解出租車"充電難"的建議》(2019).

²¹ There are some roads where EVs are not allowed to drive and some roads where car-pooling (i.e. with at least one or more passengers) is required.

²² This is regardless of the number of occupants in the vehicle, which is different from the arrangement for other diesel vehicles which are allowed only when carrying two or more people.

Support on related infrastructure and/or facilities

3.7 The development of infrastructure plays an important role to support a wider use of EVs. Against this, all places studied have sought to develop a comprehensive charging network in private premises and/or public places (**Table 4**). On **private premises**, in Hong Kong, the Government has recently committed a HK\$2 billion pilot scheme to subsidize installation of EV charging-enabling infrastructure in car parks of existing private residential buildings.²³ While the scheme has yet been implemented, similar measures are also seen in **Tokyo**, where owners of the private residential buildings or property management companies can apply for full subsidies for equipment purchase and up to ¥810,000 (HK\$58,239) for installation for each car park. Besides, full subsidy for equipment purchase in Tokyo could also be applied to commercial facilities (e.g. shopping malls). In California and Shenzhen, it is required that **at least 10% and 30%** of the total number of car parking space be reserved respectively to support EV charging purpose for new residential development.²⁴

3.8 For **public places**, the Hong Kong Government has recently allocated HK\$120 million to install over 1 000 medium chargers at government car parks which would be fully or partially open to the public. While installation subsidies are also available in other places, **Seoul** also features that there has been increased checking of chargers (once each month) and a system in place for reporting faults and complaints as a post-management measure.²⁵ To encourage enterprises investing in charging infrastructure and facilities for private and/or public use, Shenzhen provides subsidies to the investing enterprises, and the level of subsidies is based on the charging efficiency.

3.9 Increased adoption of EVs would always lead to concerns over **handling of used batteries** of EVs. According to the Government, at present, waste EV batteries are required to be properly handled under the Waste Disposal Ordinance (Cap. 354) and most EV manufacturers or agents currently

²³ Initially, the total subsidy for the retrofitting of EV charging-enabling infrastructure in car parks shall not exceed HK\$30,000 per private parking space, or HK\$15 million for each private residential development, whichever is lower. See Environment Bureau (2019).

²⁴ See International Code Council (2019) and 深圳市人民政府：《前海深港現代服務業合作區配建地下停車場智慧共用工作指引(試行)》(2018).

²⁵ See Ministry of Environment (2018).

have engaged licensed collectors to collect/handle their waste EV batteries.²⁶ Taking a more proactive approach, some places (e.g. **Singapore** and **Norway**) are currently building their own Lithium-ion battery recycling facility. It is noted that **Shenzhen** also provides a subsidy for EV manufacturers or agents to collect and handle used motive storage batteries (at RMB20 (HK\$23) per kWh).

Targeted/sector-specific measures to boost a higher adoption of EVs

3.10 Growing technology around the world has led to the emergency of new businesses in the transport sector. Car-sharing is a case in point, which is also seen as a means to control private car growth.²⁷ While relevant initiatives seem to be lacking in Hong Kong²⁸, all selected places have introduced a government-run or contracted **car-sharing programme** and ride on it to boost a greater uptick of EVs (**Table 5**). In **Seoul**, the government has recently expanded the scale of such car-sharing programme, with a plan to increase the adoption of EVs under the programme by 2022.²⁹ While in **Singapore**, a 10-year contract was awarded to an operator in 2017 for the operation of an electric car-sharing business.³⁰ According to the agreement, the operator would deploy 1 000 EVs and build 2 000 chargers, among which 400 chargers are required to be opened for public use.

3.11 There are also dedicated initiatives provided and/or requirements imposed on certain specific segments. This includes providing fixed interest rate government loan for **small- and medium- enterprises** ("SMEs") to switch to EVs in Tokyo; and granting subsidies to six **delivery service businesses** (mainly food delivery) to adopt a total of about 1 000 electric motorcycles in Seoul.³¹ Besides, in **Tokyo**, enterprises using more than 200 vehicles have been required to submit to the government an **automobile environment management plan** to progressively meet a target of at least 15% of vehicles being low emission (e.g. EVs) in the period of 2016-2020.³²

²⁶ After proper preliminary treatment, these waste EV batteries are exported to appropriate treatment facilities in Japan, Korea or Belgium for proper handling and/or recycling. See Environment Bureau (2020).

²⁷ Car-sharing refers to those does not provide chauffeur services but charges a rental based on usage of the vehicles rented and comes with proper insurance coverage.

²⁸ According to the Government, car-sharing is permitted under the existing laws of Hong Kong, and is already lawfully used by some members of the public. See GovHK (2018).

²⁹ See Seoul Metropolitan Government (2019b).

³⁰ See Land Transport Authority (2019a).

³¹ See Seoul Metropolitan Government (2019a).

³² See Bureau of Environment (2020a and 2020c).

3.12 Besides, some places have imposed mandatory EV adoption requirement on **ride-hailing** businesses.³³ For instance, in **Shenzhen**, all ride-hailing vehicles registered from December 2019 and onwards must be EVs.³⁴ Likewise in **California**, ride-hailing operators³⁵ are required to increase the proportion of zero-emission vehicles in its operation as part of the greenhouse reduction plan. However, these measures may not be applicable to Hong Kong as there is yet any dedicated legislation regulating the ride-hailing services in the city.

3.13 In **Shenzhen**, since July 2018, the government has designated an area as a **green logistic region** "綠色物流區" in each of the 10 districts which allow the access of light goods vehicle with electric powered and restrict the access of those diesel powered vehicles. The green logistic regions cover 22.33 km² or 1.1% of Shenzhen area. Though the total size is not substantial, the requirement might to certain extent boost a wider adoption of electric goods vehicles.

4. Concluding remarks

4.1 Compared with conventional vehicles, EVs help improve roadside air quality and reduce greenhouse gas emissions. As such, promoting a greater use of EVs is a trend around the world. In the places studied, they have already set a development target specifying the expected number of chargers and/or EVs, or a schedule to replace conventional petrol and diesel cars. To achieve this, provision of purchase tax exemption/reduction is a common financial incentive for EV purchase. In Hong Kong, such tax benefit is mainly applicable to battery EVs, whereas in some places (e.g. Tokyo and Norway), they also offer tax reduction in a smaller extent for hybrid vehicles or others which have a lower emission level. Some places further provide subsidies for purchase of electric private cars and electric public transport vehicles. In the case of Shenzhen, all bus fleet and taxi fleet have been converted into electric

³³ Ride-hailing generally refers to the use of smartphone applications to connect passengers with drivers directly for the provision of point to point transport service.

³⁴ This included those vehicles with ride-hailing licences to be renewed. Reportedly, about 20 000 ride-hailing petrol and hybrid vehicles would have the licence expired by 2020. See 新浪網 (2019).

³⁵ They are known as transportation network companies, providing pre-arranged transportation services for compensation using an online-enabled application or platform (such as smart phone apps) to connect drivers using their personal vehicles with passengers.

mode as a result of strong government subsidies and/or innovative purchase/operating arrangements.

4.2 Different places have also put efforts to strengthen the charging infrastructure/facilities, as they are the backbone to support a wider adoption. In Tokyo, it provides subsidies for charger installation in private premises which cover not only residential buildings but also office and commercial buildings. In California and Shenzhen, it has stipulated at least 10% and 30% of the total number of car parking space in new residential development be reserved respectively to support EV charging purpose. Most places studied have also introduced incentives to reduce the cost of owning EVs and enhance drivers' experience/convenience in terms of reduced parking fee, toll fee and/or electricity charges, as well as privilege in using certain lanes. To further facilitate EV adoption in society, some places have rolled out dedicated initiatives and/or requirements in certain business segment, e.g. promoting EV usage through government-supported car-sharing programme in Seoul. Norway and Singapore have even taken proactive measures to promote recycling of used batteries.

Research Office
Information Services Division
Legislative Council Secretariat
10 June 2020
Tel: 3919 3586

Fact Sheets are compiled for Members and Committees of the Legislative Council. They are not legal or other professional advice and shall not be relied on as such. Fact Sheets are subject to copyright owned by The Legislative Council Commission (The Commission). The Commission permits accurate reproduction of Fact Sheets for non-commercial use in a manner not adversely affecting the Legislative Council. Please refer to the Disclaimer and Copyright Notice on the Legislative Council website at www.legco.gov.hk for details. The paper number of this issue of Fact Sheet is FS01/19-20.

Table 1 – Background information

	Hong Kong	Seoul	Shenzhen	Singapore	Tokyo	California	Norway
Number of registered EVs and other clean energy vehicles	<ul style="list-style-type: none"> EVs: 14 278^{T1} (Feb 2020). 	<ul style="list-style-type: none"> EVs: 16 438 (Feb 2020). 	<ul style="list-style-type: none"> 272 687 new energy vehicles^{T2} (end-2018). 	<ul style="list-style-type: none"> EVs: 1 336 Plug-in hybrid: 473 (end-2019). 	<ul style="list-style-type: none"> EVs: 6 085 Plug-in hybrid: 11 101 Fuel cell: 732 (Mar 2019). 	<ul style="list-style-type: none"> EVs: 253 430 Plug-in hybrid: 216 042 Fuel cell: 5 528 (end-2018). 	<ul style="list-style-type: none"> EVs: 272 051 Plug-in hybrid: 116 147 (end-2019).
% share of EVs in registered vehicles	<ul style="list-style-type: none"> EV penetration: 1.6%. 	<ul style="list-style-type: none"> EV penetration: 0.5%. 	<ul style="list-style-type: none"> New energy vehicles penetration: 8.1%. 	<ul style="list-style-type: none"> EV penetration: 0.1%. 	<ul style="list-style-type: none"> EV penetration: 0.2%. 	<ul style="list-style-type: none"> EV penetration: 0.8%. 	<ul style="list-style-type: none"> EV penetration: 6.6%.
Number of public chargers	<ul style="list-style-type: none"> Standard: 1 264 (43%) Medium: 1 113 (38%) Fast: 591 (20%) Total: 2 968 (Apr 2020). 	<ul style="list-style-type: none"> Normal: 1 804 (90%) Fast: 190 (10%) Total: 1 994 (May 2020). 	<ul style="list-style-type: none"> Normal: 53 000 (64%) Fast: 30 000 (36%) Total: 83 000 (end-2019). 	<ul style="list-style-type: none"> About 1 600 (Apr 2020). 	<ul style="list-style-type: none"> Normal: 2 416 (88%) Fast: 339 (12%) Total: 2 755 (May 2020). 	<ul style="list-style-type: none"> Normal: 21 470 (83%) Fast: 4 286 (17%) Total: 25 756 (May 2020). 	<ul style="list-style-type: none"> Total: 14 939 (May 2020).
Development targets/vision	<ul style="list-style-type: none"> 2020: 30% of private cars are EVs or hybrid; and 30% of private parking spaces in new buildings be installed with charging facilities (vision set in 2011). 	<ul style="list-style-type: none"> 2020: supply 10 000 EVs^{T3}. 2022: 80 000 EVs on roads 2025: 3 000 electric buses (40% of total number of buses). 	<ul style="list-style-type: none"> 2020: At least 95% of newly procured vehicles for replacement by the government and public organizations are EVs. 	<ul style="list-style-type: none"> 2030: Up to 28 000 chargers be available at public car parks. Vision in 2040: all vehicles run on cleaner energy. 	<ul style="list-style-type: none"> 2025: 5 000 public chargers are installed. 2030: 1 000 fast chargers are installed; 50% of new cars sold are zero-emission vehicles ("ZEVs"); and at least 300 zero-emission buses. Vision in 2050: All ZEVs on roads. 	<ul style="list-style-type: none"> 2025: 1.5 million ZEVs on roads; and 250 000 chargers installed (4% being fast chargers). 2029: All new municipal buses purchased by municipalities must be zero-emission. 2030: 5 million ZEVs on roads. 	<ul style="list-style-type: none"> 2025: all new passenger cars and light vans sold should be ZEVs.

^{T1} As hybrid vehicles are counted towards the number of registered petrol or diesel vehicles according to the fuel used, there is no separate data for them.

^{T2} New energy vehicles generally refer to battery EVs, plug-in hybrid EVs and fuel cell vehicles. The breakdown is not known.

^{T3} They include 5 805 passenger cars, 1 600 goods vehicles, 1 775 motorcycles, 700 taxis and 120 buses, involving a subsidy budget of 142.3 billion won (HK\$0.95 billion).

Table 2 – Major financial incentives/support for EV purchase

	Hong Kong	Seoul	Shenzhen	Singapore	Tokyo	California	Norway
<u>Electric private cars</u> Related tax exemption/reduction for car purchase	<ul style="list-style-type: none"> Purchase tax concession of up to HK\$97,500; and up to HK\$250,000 under "One-for-One Replacement" Scheme. 100% profits tax deduction for relevant capital expenditure (applicable to enterprises only). 	<ul style="list-style-type: none"> Purchase tax concession of up to 5.3 million won (HK\$35,510). 	<ul style="list-style-type: none"> 100% exemption of purchase tax on new energy vehicles. 	<ul style="list-style-type: none"> Purchase tax rebate of up to S\$20,000 (HK\$114,800).^{T4} 	<ul style="list-style-type: none"> 100% exemption of purchase tax. 	<ul style="list-style-type: none"> Federal tax credit of up to US\$7,500 (HK\$58,770). 	<ul style="list-style-type: none"> 100% exemption of purchase tax. 100% exemption of value-added tax.
<u>Electric private cars</u> Subsidies for car purchase/switching	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> A subsidy of 10.55 million won-12.7 million won (HK\$70,685-HK\$85,090). (Applicable in 2020) 	<ul style="list-style-type: none"> A subsidy of up to RMB20,000 (HK\$22,664). 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> A subsidy of ¥300,000 (HK\$21,570) for individuals. A subsidy of ¥250,000 (HK\$17,975) for enterprises. The quota for EVs available for individuals and enterprises in 2019 was 2 000. 	<ul style="list-style-type: none"> Standard rebate: US\$2,000 (HK\$15,672). Increased rebate: US\$4,500 (HK\$35,262) for consumers with low household incomes. 	<ul style="list-style-type: none"> No.

^{T4} Tax rebate is provided under the Vehicular Emissions Scheme. Under the Scheme, high-emission cars could be subject to a surcharge of up to S\$20,000 (HK\$114,800). More recently, a similar incentive known as "EV Early Adoption Incentive" has been announced to be effective from 2021.

Table 2 – Major financial incentives/support for EV purchase (cont'd)

	Hong Kong	Seoul	Shenzhen	Singapore	Tokyo	California	Norway
Electric commercial vehicles Related tax exemption/reduction for vehicle purchase	<ul style="list-style-type: none"> 100% purchase tax exemption. 100% profits tax deduction for relevant capital expenditure (applicable to enterprises only). 	<ul style="list-style-type: none"> All EVs, regardless of whether they are private cars or commercial vehicles, receive a purchase tax concession of up to 5.3 million won (HK\$35,510). 	<ul style="list-style-type: none"> 100% exemption of purchase tax on new energy vehicles. 	<ul style="list-style-type: none"> Purchase tax rebate of up to S\$30,000 (HK\$172,200) for electric taxis.^{T5} 	<ul style="list-style-type: none"> 100% exemption of purchase tax. 	<ul style="list-style-type: none"> No specific tax incentives for car purchase at state level, but there is a 10% tax credit to zero-emission bus manufacturers. 	<ul style="list-style-type: none"> All EVs, regardless of whether they are private cars or commercial vehicles, receive 100% exemption of purchase tax, and 100% exemption of value-added tax.
Electric commercial vehicles Subsidies for vehicle purchase/switching	<ul style="list-style-type: none"> Subsidized the franchised bus companies to purchase 36 single-deck electric buses for trial. Planned to subsidize about 40 electric public light buses for trial. Provided subsidies under the Pilot Green Transport Fund for trial of about 110 electric commercial vehicles including taxis. 	<ul style="list-style-type: none"> A subsidy of 27 million won (HK\$180,900) for each electric goods vehicle purchase. A subsidy of 700,000 won (HK\$4,690) for each replacement of old diesel vehicles. A subsidy of up to 294 million won (HK\$2.0 million) for each electric bus purchase and up to 50 million won (HK\$330,000) for each related charging facility. A subsidy of up to 18.2 million won (HK\$121,940) for each electric taxi purchase (700 vehicle quota in 2020). 	<ul style="list-style-type: none"> Adopted the "混合租賃" and "整車購買，服務外包" business model for massive adoption of electric buses. A grant of RMB164,800 (HK\$186,751) and an early adoption incentive of up to RMB32,000 (HK\$36,262) for each electric taxi purchase. 	<ul style="list-style-type: none"> A subsidy of up to S\$30,000 (HK\$172,200) for each purchase of light goods vehicle with low emissions.^{T6} 	<ul style="list-style-type: none"> A subsidy of up to ¥16.6 million (HK\$1.2 million) for each electric bus purchase. A subsidy of up to ¥1 million (HK\$71,900) for each electric taxi purchase. 	<ul style="list-style-type: none"> A subsidy ranging from US\$20,000-US\$315,000 (HK\$156,720-HK\$2,468,340) for each hybrid/zero-emission truck or bus purchase. 	<ul style="list-style-type: none"> A subsidy ranging from NOK15,000-NOK50,000 (HK\$13,350-HK\$44,450) for each electric van purchase, along with NOK5,000 (HK\$4,450) for each charger. Subsidized bus operators the purchase of electric buses.

^{T5} Tax rebate is provided under the Vehicular Emissions Scheme. Under the Scheme, high-emission taxis could be subject to a surcharge of up to S\$30,000 (HK\$172,200).

^{T6} The initiative is expected to be effective from 2021, in which light goods vehicles with high emissions will be subject to a surcharge of S\$10,000 (HK\$57,400).

Table 3 – Major incentives to reduce the EV operating cost and enhance driving experience/convenience

	Hong Kong	Seoul	Shenzhen	Singapore	Tokyo	California	Norway
Reduction in recurring fee/tax for owning EVs	<ul style="list-style-type: none"> Lower annual vehicle licence fee than that for conventional cars.^{T7} 	<ul style="list-style-type: none"> A subsidy on annual car tax (130,000 won (HK\$871) for personal use; and 20,000 won (HK\$134) for commercial use. 	<ul style="list-style-type: none"> 100% exemption of annual vehicle and vessel tax. 	<ul style="list-style-type: none"> Lower road tax effective from 2021.^{T8} 	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> 100% exemption of road traffic insurance tax.
Electricity charging fee incentive/ arrangement	<ul style="list-style-type: none"> Free of charge at all government car parks and some privately-owned car parks open for public use. 	<ul style="list-style-type: none"> Up to 50% discount on battery charging for residential users. 	<ul style="list-style-type: none"> Price ceiling for charging EVs (RMB0.8 (HK\$0.9) per kWh). 	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> Free of charge at some government car parks and some privately-owned car parks open for public use. 	<ul style="list-style-type: none"> Residential users may opt for the time-of-use ("TOU") electricity rates (i.e. higher rates are charged during the peak hours, and vice versa) or standard rates. Commercial users are required to be on a TOU plan. A vehicle stationing at off-street parking facility could be towed away if it is not connected for charging purpose. 	<ul style="list-style-type: none"> Depend on utility operators.
Parking fee incentive	<ul style="list-style-type: none"> Free of charge at Housing Authority's car parks for first one to two hours. 	<ul style="list-style-type: none"> A 50% discount on parking fee at public parking lots. 	<ul style="list-style-type: none"> Free of charge at government-managed car parks for first two hours. 	<ul style="list-style-type: none"> Free of charge at some charging stations. 	<ul style="list-style-type: none"> A 50% discount at some car parks (hourly rental). 	<ul style="list-style-type: none"> Free of charge in public car parks in some cities (e.g. San Jose, Santa Monica) 	<ul style="list-style-type: none"> A discount of at least 50% of the fee charged on fossil fuel cars.
Toll fee incentive	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> Only exemption at Namsan Tunnel. 	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> Reduced rates or exemptions on high-occupancy toll lanes. 	<ul style="list-style-type: none"> A discount of at least 50% of the fee charged on fossil fuel cars.
Road use privileges	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> Access to high-occupancy vehicle lanes. 	<ul style="list-style-type: none"> Access to bus/taxi lanes.

^{T7} The annual vehicle licence fees for electric private cars range from about HK\$600 to HK\$1,100, contrasted to the range of HK\$3,815 to HK\$12,675 for conventional private cars.

^{T8} The annual usage cost (e.g. road tax and maintenance cost) of electric cars was estimated to be 9% lower than that of the internal combustion engine vehicles.

Table 4 – Major measures to strengthen related infrastructures

	Hong Kong	Seoul	Shenzhen	Singapore	Tokyo	California	Norway
<p><u>Private premises</u></p> <p>Initiatives to strengthen charging facilities</p>	<ul style="list-style-type: none"> Granting Gross Floor Area concessions for installation of EV charging-enabling infrastructure in car parks of new private buildings. Allocated HK\$2 billion to subsidize the installation of EV chargers at existing private residential buildings. According to the recommendations of Hong Kong Planning Standards and Guidelines, at least 30% of private parking spaces in new buildings (e.g. residential developments and commercial facilities) to be installed with charging facilities. 	<ul style="list-style-type: none"> Opened up the market of EV charging services on installation, operation and maintenance of chargers. Such service providers were previously government-designated. 	<ul style="list-style-type: none"> Support enterprises to provide charging services with a subsidy ranging from RMB100-RMB400 (HK\$113-HK\$453) per kW (depend on type of charger), e.g. a 20 kW charger could have a subsidy of RMB2,000 (HK\$2,260).^{T9} At least 30% of the total number of car parking space be equipped with chargers for new residential development (10% for office buildings). 	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> A full subsidy for equipment purchase and up to ¥810,000 (HK\$58,239) for installation for each car park of both private residential buildings and office buildings. 	<ul style="list-style-type: none"> A rebate ranging from US\$150-US\$1,000 (HK\$1,175-HK\$7,836) for each equipment purchase and/or installation of a charger for residential users. At least 10% of the total number of car parking space be reserved to support EV charging purpose for new residential development. Eligible small businesses may apply for government loan (maximum US\$500,000 (HK\$3.9 million) for each borrower) for the development of EV charging equipment; and upon completion of installation and loan repayment, there will be a rebate at 10%-15% of the loan amount. 	<ul style="list-style-type: none"> In some cities, e.g. in Oslo, private companies and housing associations can apply for a grant of up to NOK10,000 (HK\$8,900) per charger.

^{T9} To be eligible for the subsidies, enterprises are required to install charging facilities with a total power output of at least 8 000 kW (e.g. roughly at least 1 000 slow chargers (7 kW)).

Table 4 – Major measures to strengthen related infrastructures (cont'd)

	Hong Kong	Seoul	Shenzhen	Singapore	Tokyo	California	Norway
<p><u>Premises/ places open to public</u></p> <p>Initiatives to strengthen charging facilities</p>	<ul style="list-style-type: none"> Allocated HK\$120 million to extend the public EV charging networks at government car parks. 	<ul style="list-style-type: none"> Opened up the market of EV charging services on installation, operation and maintenance of chargers. Such service providers were previously government-designated. A subsidy ranging from 2.5 million won- 3.5 million won (HK\$16,750-HK\$23,540) for each charger. Regular checking of chargers (one time per month) and a system in place for reporting faults and complaints. 	<ul style="list-style-type: none"> Support enterprises to provide charging services with a subsidy ranging from RMB100-RMB400 (HK\$113-HK\$453) per kW (depend on type of charger), e.g. a 20 kW charger could have a subsidy of RMB2,000 (HK\$2,260).^{T10} At least 30% of the total number of car parking space be equipped with chargers for new public buildings. 	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> A full subsidy for the charging equipment purchase for commercial facilities (e.g. shopping malls). 	<ul style="list-style-type: none"> Property owners that install public commercial charging stations may be eligible for rebates by utility companies. Eligible small businesses may apply for government loan (maximum US\$500,000 (HK\$3.9 million for each borrower) for the development of EV charging equipment; and upon completion of installation and loan repayment, there will be a rebate at 10%-15% of the loan amount. 	<ul style="list-style-type: none"> A policy in place to ensure at least two fast charging stations every 50 km on the main roads.
Handling of used batteries	<ul style="list-style-type: none"> Most EV manufacturers or agents engage licensed collectors to handle waste batteries. 	<ul style="list-style-type: none"> Reportedly, a collection centre is being built.^{T11} 	<ul style="list-style-type: none"> A subsidy for EV manufacturers or agents to collect and handle used motive storage batteries (RMB20 (HK\$23) per kWh). 	<ul style="list-style-type: none"> A lithium-ion battery recycling facility to be set up.^{T12} 	<ul style="list-style-type: none"> Information not available. 	<ul style="list-style-type: none"> Under planning. An advisory group has been set up to consider the related policy.^{T13} 	<ul style="list-style-type: none"> A lithium-ion battery recycling facility to be set up.^{T14}

^{T10} To be eligible for the subsidies, enterprises are required to install charging facilities with a total power output of at least 8 000 kW (e.g. roughly at least 1 000 slow chargers (7 kW)).

^{T11} See The Korea Herald (2020b).

^{T12} The size of the facility is about 10 000 sq m which costs about S\$20 million (HK\$114.8 million). It is expected to recycle 14 tonnes of lithium-ion batteries a day.

^{T13} It was created to advise the legislature of California on policies pertaining to the recovery and recycling of lithium-ion vehicle batteries.

^{T14} Besides, the government finances 50% of the project costs for companies investing in the research of recycling of materials in lithium-ion batteries.

Table 5 – Targeted/sector-specific measures to boost a higher adoption of EVs

	Hong Kong	Seoul	Shenzhen	Singapore	Tokyo	California	Norway
Launch of electric car-sharing programme by the government	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> Yes. 	<ul style="list-style-type: none"> Yes. 	<ul style="list-style-type: none"> Yes. The operator would build 2 000 chargers, of which 400 are required to be opened for public use). 	<ul style="list-style-type: none"> Yes. 	<ul style="list-style-type: none"> Yes, in some cities (e.g. Los Angeles and Sacramento). 	<ul style="list-style-type: none"> Yes, in some cities (e.g. Oslo).
Requirement of EV adoption in ride-hailing sector	<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Vehicles registered from December 2019 and onwards must be purely electric. 	<ul style="list-style-type: none"> No. 	<ul style="list-style-type: none"> Not applicable. 	<ul style="list-style-type: none"> Ride-hailing operators are required to increase the proportion of zero-emission vehicles. 	<ul style="list-style-type: none"> Not applicable.
Other targeted measures/ requirements	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> A subsidy provided to six companies providing delivery services (mainly food delivery) to adopt about 1 000 electric motorcycles (for replacement/ expansion). 	<ul style="list-style-type: none"> Electric light goods vehicles can access the 10 green logistic regions, whereas conventional diesel vehicles are restricted. 	<ul style="list-style-type: none"> Not specifically stated. 	<ul style="list-style-type: none"> For enterprises deploying more than 200 vehicles, at least 15% are low-emission vehicles. SMEs may apply for a fixed interest rate government loan (maximum ¥100 million (HK\$7.2 million)) to convert conventional vehicles into EVs. 	<ul style="list-style-type: none"> Car manufacturers are required to produce certain proportion of zero-emission vehicles based on the total number of cars sold. 	<ul style="list-style-type: none"> Not specifically stated.

References

Hong Kong

1. Environment Bureau. (2019) *Administration's paper on "Further Measures to Improve Air Quality (Part 1)"*. LC Paper No. CB(1)233/19-20(05). Available from: <https://www.legco.gov.hk/yr19%2D20/english/panels/ea/papers/ea20191216cb1-233-5-e.pdf> [Accessed June 2020].
2. Environment Bureau. (2020) *Administration's paper on "Promoting the Use of Electric Vehicles"*. LC Paper No. CB(1)589/19-20(01). Available from: https://www.legco.gov.hk/yr19%2D20/english/panels/ea/ea_ev/papers/ea_ev20200511cb1-589-1-e.pdf [Accessed June 2020].
3. *Environmental Protection Department*. (2020) Available from: <https://www.epd.gov.hk/> [Accessed June 2020].
4. GovHK. (2018) *LCQ3: Personalised and point-to-point transport service*. Available from: <https://www.info.gov.hk/gia/general/201801/31/P2018013100510.htm> [Accessed June 2020].
5. GovHK. (2020a) *Electric vehicle roadmap update*. Available from: https://www.news.gov.hk/eng/2020/02/20200227/20200227_180629_280.html [Accessed June 2020].
6. GovHK. (2020b) *LCQ7: Promoting electric vehicles*. Available from: <https://www.info.gov.hk/gia/general/202005/06/P2020050600552.htm> [Accessed June 2020].
7. Legislative Council Secretariat. (2019) *Background brief on Franchised Taxi Services Bill*. LC Paper No. CB(4)950/18-19(02). Available from: <https://www.legco.gov.hk/yr18%2D19/english/bc/bc102/papers/bc10220190603cb4-950-2-e.pdf> [Accessed June 2020].
8. Legislative Council Secretariat. (2020) *Updated background brief on measures to promote the use of electric vehicles*. LC Paper No. CB(1)336/19-20(05). Available from: <https://www.legco.gov.hk/yr19%2D20/english/panels/ea/papers/ea20200122cb1-336-5-e.pdf> [Accessed June 2020].

9. Office of The Ombudsman. (2019) *Direct Investigation Report: Government's Planning and Arrangements for Ancillary Facilities for Electric Private Vehicles*. Available from: https://ofomb.ombudsman.hk/abc/files/DI415_%2D_Report_Full_set_EN.docx [Accessed June 2020].

California (the United States)

10. California Air Resources Board. (2020) *Zero-Emission Vehicle Program*. Available from: <https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program/about> [Accessed June 2020].
11. California Environmental Protection Agency. (2020) *Lithium-ion Car Battery Recycling Advisory Group*. Available from: <https://calepa.ca.gov/climate/lithium-ion-car-battery-recycling-advisory-group/> [Accessed June 2020].
12. California Legislative Information. (2018a) *SB-1014 California Clean Miles Standard and Incentive Program: zero-emission vehicles. Chapter 369*. Available from: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1014 [Accessed June 2020].
13. California Legislative Information. (2018b) *Vehicle Code: Section 22511*. Available from: http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=22511.&lawCode=VEH [Accessed June 2020].
14. California Public Utilities Commission. (2020a) *What are TOU rates?* Available from: <https://www.cpuc.ca.gov/General.aspx?id=12194> [Accessed June 2020].
15. California Public Utilities Commission. (2020b) *Zero Emission Vehicle (ZEV) Rate Programs*. Available from: <https://www.cpuc.ca.gov/General.aspx?id=12184> [Accessed June 2020].
16. Center for Sustainable Energy. (2020a) *Air District and Utility EV Rebates*. Available from: <https://cleanvehiclerebate.org/eng/ev/incentives/local-rebates> [Accessed June 2020].

17. Center for Sustainable Energy. (2020b) *State and Federal Electric Vehicle Incentives*. Available from: <https://cleanvehiclerebate.org/eng/ev/incentives/state-and-federal> [Accessed June 2020].
18. *Department of Motor Vehicles, State of California*. (2020) Available from: <https://www.dmv.ca.gov> [Accessed June 2020].
19. Governor's Interagency Working Group on Zero-Emission Vehicles, State of California. (2018) *2018 ZEV Action Plan: Priorities Update*. Available from: <https://static.business.ca.gov/wp-content/uploads/2019/12/2018-ZEV-Action-Plan-Priorities-Update.pdf> [Accessed June 2020].
20. International Code Council. (2019) *California Green Building Standards Code, Title 24, Part 11*. Available from: <https://codes.iccsafe.org/content/CAGBSC2019/chapter-4-residential-mandatory-measures> [Accessed June 2020].
21. US Department of Energy's Office of Energy Efficiency and Renewable Energy. (2020) *Federal Tax Credits for New All-Electric and Plug-in Hybrid Vehicles*. Available from: <https://www.fueleconomy.gov/feg/taxevb.shtml> [Accessed June 2020].
22. US Department of Energy's Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Office. (2020) *Alternative Fuels Data Center*. Available from: <https://afdc.energy.gov/> [Accessed June 2020].

Norway

23. Bloomberg. (2020) *Tesla Record Pushes Norway's Share of Electric Car Sales to 42%*. Available from: <https://www.bloomberg.com/news/articles/2020-01-03/tesla-record-pushes-norway-s-share-of-electric-car-sales-to-42> [Accessed June 2020].
24. CEMOBIL. (Undated) *Oslo – The EV Capital of the World*. Available from: http://www.cemobil.eu/docs/file/cemobil_kongress_pr%C3%A4sentation_city_of_oslo_portvik.pdf [Accessed June 2020].

25. Electrive.com. (2019) *Oslo: Charging electric cars no longer free of charge*. Available from: <https://www.electrive.com/2019/03/03/oslo-charging-electric-cars-no-longer-free-of-charge/> [Accessed June 2020].
26. ENOVA. (2020) *Support for land transport*. Available from: <https://www.enova.no/bedrift/landtransport> [Accessed June 2020].
27. Institute of Transport Economics, Norwegian Centre for Transport Research. (2018) *The development of organised car sharing in Norway: 1995-2018*. Available from: <https://www.toi.no/getfile.php?mfileid=49603> [Accessed June 2020].
28. Ministry of Transport. (2019) *Norway is electric*. Available from: <https://www.regjeringen.no/en/topics/transport%2Dand%2Dcommunications/veg/faktaartikler-vei-og-ts/norway-is-electric/id2677481/> [Accessed June 2020].
29. NOBIL. (2020) Available from: <https://info.nobil.no/index.php/2-uncategorised/24-tjenester> [Accessed June 2020].
30. Norges forskningsråd. (2018) *LIBRES - Lithium ion Battery Recycling*. Available from: <https://prosjektbanken.forskningsradet.no/#/project/NFR/282328> [Accessed June 2020].
31. Norsk elbilforening. (2017a) *Charging infrastructure experiences in Norway – the worlds most advanced EV market*. Available from: <https://elbil.no/wp-content/uploads/2016/08/EVS30-Charging-infrastrucure-experiences-in-Norway-paper.pdf> [Accessed June 2020].
32. Norsk elbilforening. (2017b) *Put a price on carbon to fund EV incentives – Norwegian EV policy success*. Available from: <https://elbil.no/wp-content/uploads/2016/08/EVS30-Norwegian-EV-policy-paper.pdf> [Accessed June 2020].
33. Norsk elbilforening. (2020) *Norwegian EV policy*. Available from: <https://elbil.no/english/norwegian-ev-policy/> [Accessed June 2020].
34. Statistics Norway. (2020) *Registered vehicles*. Available from: <https://www.ssb.no/en/bilreg> [Accessed June 2020].

35. The Driven. (2019) *Norway approaches 250,000 EVs while drivers queue to use fast chargers*. Available from: <https://thedriven.io/2019/07/30/norway-approaches-250000-evs-while-drivers-queue-to-use-fast-chargers/> [Accessed June 2020].
36. The Norwegian Tax Administration. (2020) *Road traffic insurance tax*. Available from: <https://www.skatteetaten.no/en/business-and-organisation/vat-and-duties/excise-duties/about-the-excise-duties/road-traffic-insurance/> [Accessed June 2020].

Seoul

37. Electronic Times. (2020) *Reducing the number of chargers from 24 000 to 8 000*. Available from: <https://m.etnews.com/20200117000112> [Accessed June 2020].
38. GOV.KR. (2019) *Extension of electric charging discount to June next year*. Available from: <https://www.gov.kr/portal/gvrnPolicy/view/H1912000000241411?policyType=G00301&srchTxt=%EC%A0%84%EA%B8%B0%EC%B0%A8%20%ED%95%A0%EC%9D%B8%20%EC%9A%94%EA%B8%88> [Accessed June 2020].
39. KECO. (2020) Available from: <https://ev.or.kr> [Accessed June 2020].
40. Korea JoongAng Daily. (2019) *Kepeco ending its household discount program*. 30 December. Available from: <https://koreajoongangdaily.joins.com/news/article/article.aspx?aid=3072060> [Accessed June 2020].
41. Ministry of Environment. (2018) *Create a charging environment without inconvenience in using electric vehicles*. Available from: <http://www.me.go.kr/home/web/board/read.do?pagerOffset=0&maxPageItems=10&maxIndexPages=10&searchKey=title&searchValue=%EC%A0%84%EA%B8%B0&menuId=286&orgCd=&boardId=917960&boardMasterId=1&boardCategoryId=&decorator> [Accessed June 2020].
42. Seoul Metropolitan Government. (2018) *Press Releases – Seoul goes electric in public transportation*. 13 March. Available from: <http://english.seoul.go.kr/seoul-goes-electric-public-transportation-running-electric-city-buses-coming-september> [Accessed June 2020].

43. Seoul Metropolitan Government. (2019a) *Press Releases – Seoul signs a partnership with six franchises and delivery service providers to replace with electric motorcycles.* 24 April. Available from: <http://english.seoul.go.kr/seoul-signs-a-partnership-with-six-franchises-and-delivery-service-providers-to-replace/?keyword=electric&cat=46> [Accessed June 2020].
44. Seoul Metropolitan Government. (2019b) *Press Releases – Seoul to launch the third phase of sharing car (Nanum Car) program, making it a semi-public transportation means by 2022.* 1 July. Available from: <http://english.seoul.go.kr/seoul-to-launch-the-third-phase-of-sharing-car-nanum-car-program/> [Accessed June 2020].
45. Seoul Metropolitan Government. (2020a) *2018 Climate Change White Paper – Low Carbon City.* Available from: <http://news.seoul.go.kr/env/files/2020/01/5e153607e086f1.98110059.pdf> [Accessed June 2020].
46. Seoul Metropolitan Government. (2020b) *Environment & Energy news – Seoul Receives Applications for Subsidy with the Goal of Distributing 10,000 Electric Vehicles in 2020.* Available from: <http://english.seoul.go.kr/seoul-receives-applications-for-subsidy-with-the-goal/> [Accessed June 2020].
47. Seoul Metropolitan Government. (2020c) *Number of registered vehicles in Seoul.* Available from: <http://data.seoul.go.kr/dataList/10860/S/2/datasetView.do#none> [Accessed June 2020].
48. Seoul Metropolitan Government. (2020d) *Press Releases – Seoul to provide 10,000 electric cars this year, and receive the subsidy application from Feb. 17.* 12 February. Available from: <http://english.seoul.go.kr/seoul-to-provide-10000-electric-cars-this-year-and-receive-the-subsidy-application-from-feb-17/> [Accessed June 2020].
49. The Korea Herald. (2020a) *Seoul City seeks to subsidize 80,000 electric cars by 2022.* 27 September. Available from: <http://www.koreaherald.com/view.php?ud=20180927000645> [Accessed June 2020].
50. The Korea Herald. (2020b) *Where do EV batteries go when they die?* 5 May. Available from: <http://www.koreaherald.com/view.php?ud=20200505000209> [Accessed June 2020].

Shenzhen

51. Zhang, Q. (2019) *Analysis of "Shenzhen Model" for New Energy Vehicle Promotion in Public Transportation*. Available from: https://www.researchgate.net/publication/334692522_Analysis_of_Shenzhen_Model_for_New_Energy_Vehicle_Promotion_in_Public_Transportation [Accessed June 2020].
52. 人民網：《今年深圳實現公車純電動》，2017年，網址：<http://auto.people.com.cn/n1/2017/0810/c1005-29463482.html> [於2020年6月登入]。
53. 中國能源網：《疫情之下地方促新能源汽車發展"臨時性"地方補貼向使用傾斜》，2020年，網址：<https://www.china5e.com/news/news-1088907-1.html> [於2020年6月登入]。
54. 前瞻經濟學人：《產業之問：誰是中國新能源汽車推廣應用市場的"示範標杆"？》，2019年，網址：<https://www.qianzhan.com/analyst/detail/220/191016-4f8fd606.html> [於2020年6月登入]。
55. 國家稅務總局：《財政部稅務總局工業和信息化部交通運輸部：關於節能新能源車船享受車船稅優惠政策的通知》，2018年，網址：http://www.chinatax.gov.cn/n810341/n810755/c3640048/content.html?wscckey=a97e81ed1f7c4adf_1590483774 [於2020年6月登入]。
56. 深圳市人民政府：《前海深港現代服務業合作區配建地下停車場智慧共用工作指引(試行)》，2018年，網址：http://www.sz.gov.cn/cn/xxgk/zfxxgj/zcjd/content/post_1387803.html [於2020年6月登入]。
57. 深圳市人民政府：《深圳市交通運輸委員會深圳市發展和改革委員會深圳市財政委員會關於印發〈深圳市純電動巡遊出租車超額減排獎勵試點實施方案〉(2017-2018年度)〉的通知》，2018年，網址：http://www.sz.gov.cn/zfgb/2018/gb1034/content/mpost_5003124.html [於2020年6月登入]。

58. 深圳市人民政府：《深圳市財政委員會深圳市發展和改革委員會關於印發《深圳市 2018 年新能源汽車推廣應用財政支持政策》的通知》，2019 年，網址：http://www.sz.gov.cn/zfgb/2019/gb1087/content/post_4998331.html [於 2020 年 6 月登入]。
59. 深圳市人民政府：《深圳市發展和改革委員會關於印發《深圳市 2019-2020 年新能源汽車推廣應用財政補貼實施細則》的通知》，2020 年，網址：http://www.sz.gov.cn/zfgb/2020/gb1138/content/post_6751038.html [於 2020 年 6 月登入]。
60. 深圳市公安局：《深圳市公安局交通警察局關於繼續施行〈新能源純電動物流車電子備案規程〉的通告》，2020 年，網址：http://ga.sz.gov.cn/ZWKG/QT/GSGG/content/post_6854479.html [於 2020 年 6 月登入]。
61. 深圳市史志辦公室：《交通運輸》，2020 年，網址：http://www.sz.gov.cn/cn/zjsz/nj/content/mpost_7148469.html [於 2020 年 6 月登入]。
62. 深圳市生態環境局：《2020 年"深圳藍"可持續行動計劃》，2020 年，網址：<http://meeb.sz.gov.cn/attachment/0/520/520549/7294665.pdf> [於 2020 年 6 月登入]。
63. 深圳市發展和改革委員會：《關於應對新冠肺炎疫情影響促進深圳市新能源汽車推廣應用的若干措施(徵求意見稿)》，2020 年，網址：<http://fgw.sz.gov.cn/attachment/0/513/513514/7269406.doc> [於 2020 年 6 月登入]。
64. 深圳市福田區發展和改革局：《2019 年-關於推進實施停車充電一體化"智能立體車庫"民生工程，建設智慧幸福福田的建議》，2019 年，網址：http://sso.sz.gov.cn/pub/ftqzf/bmxx/qfzhggj/tzgg/201912/t20191203_18904659.htm [於 2020 年 6 月登入]。
65. 深圳市福田區發展和改革局：《2019 年-關於緩解出租車"充電難"的建議》，2019 年，網址：http://sso.sz.gov.cn/pub/ftqzf/bmxx/qfzhggj/tzgg/201912/t20191203_18904653.htm [於 2020 年 6 月登入]。

66. 深圳市龍崗區人民政府：《〈龍崗區電動汽車快速充電樁及配套設施臨時用地和臨時建築審批指引(試行)〉解讀》，2019 年，網址：http://www.lg.gov.cn/xxgk/zwgk/flfg/zcjd/201912/t20191216_18934176.htm [於 2020 年 6 月登入]。
67. 新浪網：《深圳近 2 萬合規網約車將洗牌會否出現"打車難"？》，2019 年，網址：<http://auto.sina.com.cn/news/hy/2019-09-18/detail-iicezueu6591472.shtml> [於 2020 年 6 月登入]。
68. 新華網：《三部門明確新能源汽車免徵車輛購置稅有關政策》，2020 年，網址：http://www.xinhuanet.com/tech/2019-11/20/c_1125251683.htm [於 2020 年 6 月登入]。
69. 新華網：《深圳：新註冊網約車必須為純電動》，2019 年，網址：http://www.xinhuanet.com/tech/2019-11/20/c_1125251683.htm [於 2020 年 6 月登入]。
70. 新華網：《"混合所有制"助力深圳公交純電動化》，2018 年，網址：http://www.xinhuanet.com/2018-01/24/c_1122310137.htm [於 2020 年 6 月登入]。
71. 騰訊網：《深圳充電基礎設施建設與新能源車發展"並駕齊驅"》，2020 年，網址：<https://new.qq.com/omn/20200403/20200403A04FV100.html> [於 2020 年 6 月登入]。

Singapore

72. Economic Development Board. (2019) *New lithium-ion battery recycling facility to be set up by e-waste recycler TES*. Available from: <https://www.edb.gov.sg/en/news-and-events/news/new-lithium-ion-battery-recycling-facility-to-be-set-up-by-e-waste-recycler-tes.html> [Accessed June 2020].
73. Government of Singapore. (2020) *I am supporting my family – Planning for the future*. Available from: <https://www.gov.sg/article/i-am-supporting-my-family-planning-for-the-future> [Accessed June 2020].

74. Land Transport Authority. (2019a) *Electric Vehicles (Electric Car-Sharing Programme)*. Available from: https://www.lta.gov.sg/content/ltagov/en/industry_innovations/technologies/electric_vehicles.html [Accessed June 2020].
75. Land Transport Authority. (2019b) *Motor Vehicle Population by Type of Fuel Used*. Available from: https://www.lta.gov.sg/content/dam/ltagov/who_we_are/statistics_and_publications/statistics/pdf/MVP01-4_MVP_by_fuel.pdf [Accessed June 2020].
76. Land Transport Authority. (2020a) *Joint News Release by the Land Transport Authority (LTA) & NEA – Promoting the Adoption of Cleaner Commercial Vehicles*. Available from: https://www.lta.gov.sg/content/ltagov/en/newsroom/2020/march/news%2Dreleases/Promoting_the_adoption_of_cleaner_commercial_vehicles.html [Accessed June 2020].
77. Land Transport Authority. (2020b) *Vehicle emission schemes*. Available from: <https://www.onemotoring.com.sg/content/onemotoring/home/buying/upfront-vehicle-costs/emissions-charges.html> [Accessed June 2020].
78. Ministry of Finance. (2020) *Budget 2020 – Advancing as One Singapore*. Available from: https://www.sgpc.gov.sg/sgpcmedia/media_releases/mof/press_release/P%2D20200218%2D6/attachment/FY2020%20Budget%20Statement%20FINAL.pdf [Accessed June 2020].

Tokyo

79. Automobile Inspection & Registration Information Association. (2019) *Number of low-pollution vehicles by fuel type*. Available from: [https://www.airia.or.jp/publish/file/r5c6pv000000ogz8-att/\(5\).pdf](https://www.airia.or.jp/publish/file/r5c6pv000000ogz8-att/(5).pdf) [Accessed June 2020].
80. Bureau of Environment. (2019a) *Aiming for net zero CO2 emissions from vehicles – Tokyo ZEV Promotion Strategy*. Available from: https://www.kankyo.metro.tokyo.lg.jp/en/about_us/zero_emission_tokyo/strategy.files/Full-ver.ZEV-strategy.pdf [Accessed June 2020].

81. Bureau of Environment. (2019b) *Tokyo Environmental White Paper 2019*. Available from: https://www.kankyo.metro.tokyo.lg.jp/basic/plan/white_paper/100200a20191031132600879.files/2019zenbun.pdf [Accessed June 2020].
82. Bureau of Environment. (2020a) *Automobile environmental management plan*. Available from: <https://www.kankyo.metro.tokyo.lg.jp/vehicle/sgw/newplan/newplan.html> [Accessed June 2020].
83. Bureau of Environment. (2020b) *Information for loan mediation system*. Available from: https://www.kankyo.metro.tokyo.lg.jp/vehicle/air_pollution/diesel/loan/loan.html [Accessed June 2020].
84. Bureau of Environment. (2020c) *Obligations for enterprises to introduce specific low-pollution and fuel-efficient vehicles*. Available from: <https://www.kankyo.metro.tokyo.lg.jp/vehicle/sgw/pollution/obligation.html> [Accessed June 2020].
85. Bureau of Environment. (2020d) *Paid parking fee discount measures for low-pollution and fuel-efficient vehicles*. Available from: <https://www.kankyo.metro.tokyo.lg.jp/vehicle/sgw/pollution/discount.html> [Accessed June 2020].
86. GoGoEV. (2020) *Number of chargers in Japan*. Available from: <https://ev.gogo.gs/report/evchargers/> [Accessed June 2020].
87. Kankyo-business. (2019) *A maximum subsidy of 50 million yen for introducing fuel cell bus in Tokyo*. 1 July. Available from: <https://www.kankyo-business.jp/news/015017.php> [Accessed June 2020].
88. Kanto District Transport Bureau. (2019) *Number of vehicles in Kanto District*. Available from: https://www.tb.mlit.go.jp/kanto/jidou_gian/toukei/date/h30/hoyu3103_2.pdf [Accessed June 2020].
89. Ministry of Internal Affairs and Communications. (2019) *Significant change in car tax system*. Available from: https://www.soumu.go.jp/main_sosiki/jichi_zeisei/czaisei/131410.html [Accessed June 2020].
90. Tokyo Metropolitan Center for Climate Change Actions. (2020) Available from: <https://www.tokyo-co2down.jp> [Accessed June 2020].