

# ASIA-PACIFIC ECONOMIC COOPERATION (APEC)

## APEC Workshops

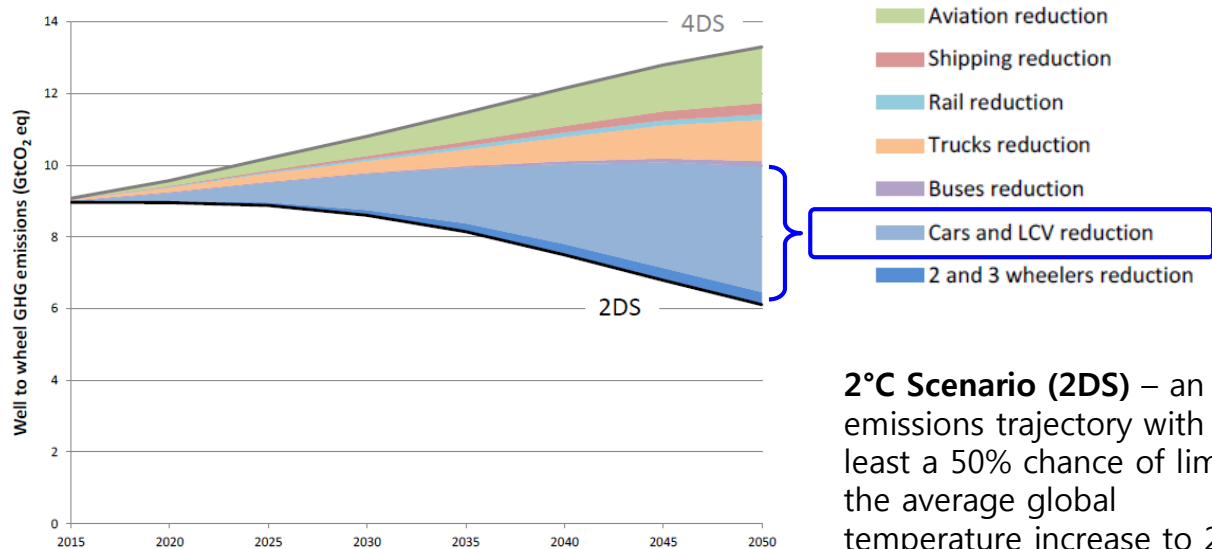
### Wide Scale Promotion of Low-emission Vehicles for Hong Kong – Challenges and Opportunities

Mr. Raymond Choi  
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HK Electric

Date: 18 March 2019

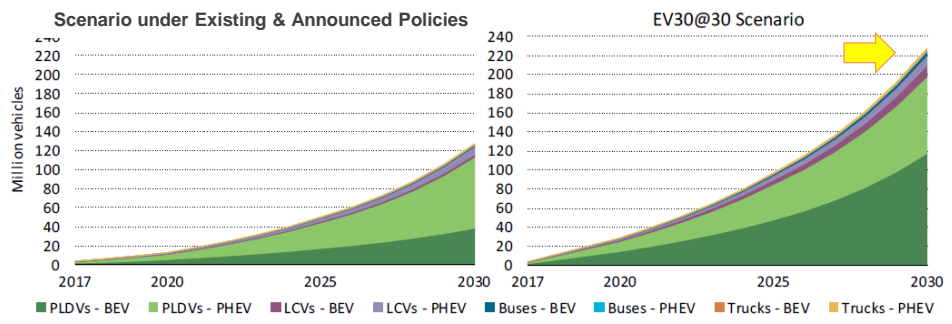
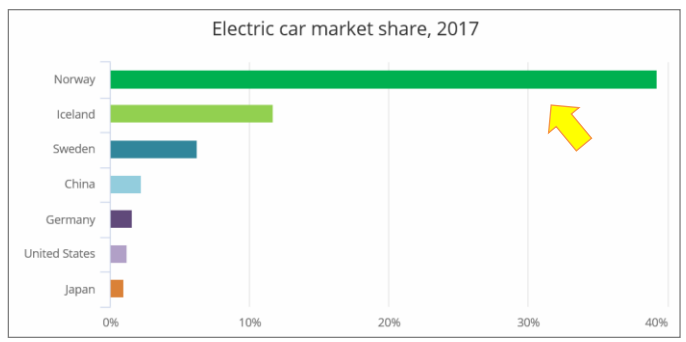
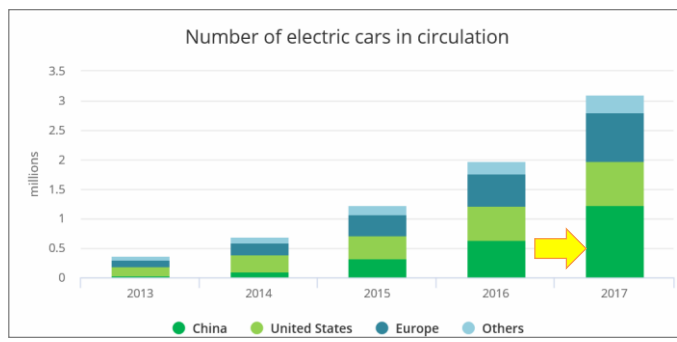
# GHG Emissions – Transport

- Low-emission vehicles (i.e. electric vehicles) are a major component of the 2DS, and vital to achieving “well below 2 degree” ambitions



Source: Accelerating electric vehicle deployment and support policies (2016), International Energy Agency

# Global Outlook of EV



## IEA Global EV Outlook 2018 (EV30@30)

- EV accounts for 30% new vehicle sales by 2030
- 220 million EVs on the road by 2030

Notes: PLDVs = passenger light duty vehicles; LCVs = light commercial vehicles; BEVs = battery electric vehicles; PHEV = plug-in hybrid electric vehicles.

Source: © OECD/IEA, Global EV Outlook 2018, IEA Publishing. Licence: [www.iea.org/t&c](http://www.iea.org/t&c)

# Electrification of Road Transport in Hong Kong

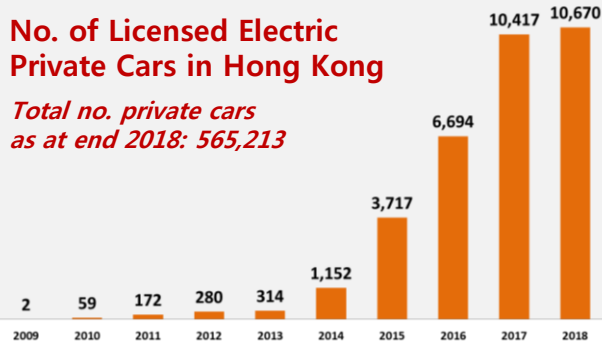
As at Dec 2018	Average Daily Passenger Journeys	Licensed Fleet	Electrified	
			No.	%
Franchised Buses	4.1 M	6,294 buses	33	0.5%
Public Light Buses	1.8 M	4,323 buses	0	0%
Taxis	0.9 M	18,143 taxis	0	0%
<b>Private cars</b>		<b>565,213</b>	<b>10,670</b>	<b>~2%</b>
Goods vehicles		115,804	83	~0.1%
Motor cycles		54,856	10	~0.1%
Government & Special vehicles		1,763	91	~1%
Other Buses/Coaches		7,629	8	~0.1%
Private Light Buses		3,346	6	~0.2%

Source: Transport Department, HKSAR Government

# Trend of EV Adoption in Hong Kong

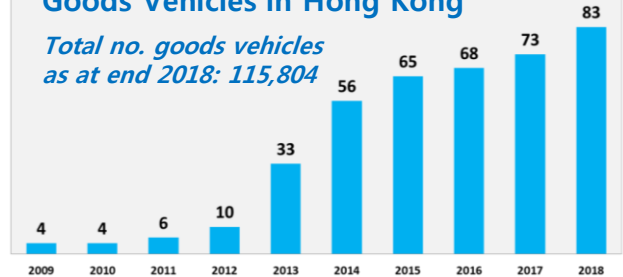
## No. of Licensed Electric Private Cars in Hong Kong

*Total no. private cars as at end 2018: 565,213*

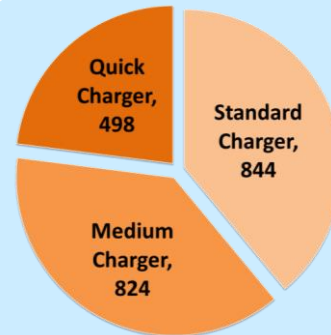


## No. of Licensed Electric Goods Vehicles in Hong Kong

*Total no. goods vehicles as at end 2018: 115,804*



- Only a handful of public EV charger was available in 2009
- HK Electric has embarked free EV-charging service since 2009



- As at Jan 2019, there are 2,166 EV chargers for public use

# Hong Kong – A Perfect City for EV?

- High density of high-rise buildings
- Sub-tropical weather
- Hilly terrain
- One of the cities with the most reliable electricity supply infrastructure
- Longest point-to-point commute is about 60 km (e.g. A to B, C to D)
- Daily mileage
  - Private cars: Few tens of kilometres
  - Public transport: >200/300 km
- Blue print for transforming to a low-carbon smart city
- Well-established fossil-fueled car market and networks of refueling stations



Source: Promoting the Use of Electric Vehicles (Feb 2018), LegCo EA Panel

# Wider Adoption of EV in HK - Challenges

High density of high-rise buildings



- Cars are parked in multi-storey car parks with parking bays either owned or rented by the drivers
- Existing car parks are not designed for EV charger installation
- Aged buildings may not have spare communal power capacity for EV chargers
- Permissions from the building owners and other parking bay owners/users are required for EV charger installation and associated wiring work

Sub-tropical weather

- Air-conditioning is a must in hot and humid days, especially during traffic congestion

Hilly terrain

- Uphill climbing ability is a must, especially for buses & light buses

Long travel range for public transport

- Sufficient top-up/quick chargers or spare vehicles are required for fleet operation

Well-established fossil-fueled car market

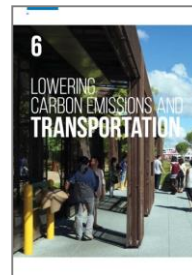
- Keen competition with fossil-fueled cars on choices, prices and refueling convenience

# Wider Adoption of EV in HK -Opportunities

Aspiration for becoming a low-carbon smart city



- Policy support for EV development in Hong Kong as one of the means to reduce carbon intensity, improve air quality and transform to a smart city



High density of high-rise buildings



- EV as a key means to solve roadside emission problem given buildings are packed along road sides especially in urban areas

Private cars' short commute distance



- Present EVs are able to cope with the driving range requirement; "refueling" frequency can be on par with fossil-fueled cars

Reliable electricity supply infrastructure



- Adequate and reliable electricity supply supports the EV charging infrastructure development, especially top-up quick chargers



# Overcome Challenges & Seize Opportunities Governments' Policies

- **First registration tax (FRT) concessions** for EV
- **100% profits tax deduction** for the capital expenditure on EVs in the first year of procurement
- **A HK\$300 million Pilot Green Transport Fund** to encourage trial of green innovative and low carbon transport technologies (including electric commercial vehicles)
- **\$180 million for franchised bus companies** to purchase 36 single-deck electric buses
- **Gross Floor Area concession** for new development with all parking spaces EV charging – enabled
- **Guidelines for setting up EV chargers**
- **2018 Policy Address:** consider ceasing the first registration of diesel private cars subject to consultation with stakeholders
- **2019-20 Budget:** \$120 million to extend the public EV charging networks at government car parks



Source: Hong Kong's Climate Action Plan 2030+, Environment Bureau, HKSAR Government

# Overcome Challenges & Seize Opportunities HK Electric's Endeavours



Supply reliability of > 99.999% since 1997



Introduced EVs in early 1980's,  
> 40% EVs in corporate fleet as at today



Free EV charging service since 2009



We Power Hong Kong's  
Formula E

HK Electric is excited to continue powering Formula E  
Racing in Hong Kong as its official energy partner.  
HK Electric - the Power Behind Hong Kong.



International Competition on **Second Life for Retired Batteries from Electric Vehicles**



**Champion Proposal**

電動車 充電易  
Drive EV • Charge Easy

- Grid supply capacity checks, site inspections and technical advisory services
- 2016-2018: helped customers install over 150 EV chargers at their premises

**Hong Kong, China**

# Drivers for Further EV Adoption (1/5)

## Advent of Technologies

**Lowering battery cost, longer range per charge**

	2010	2017
EV Li-ion Battery Installed Capacity (GWh)	0.4	94.2
EV Li-ion Battery Cost (USD/kWh)	1,000	209
Range of Commercially available EV (km)	~100	~500

Source: Global EV Outlook 2018, IEA; internet research



**More affordable choice of EVs**

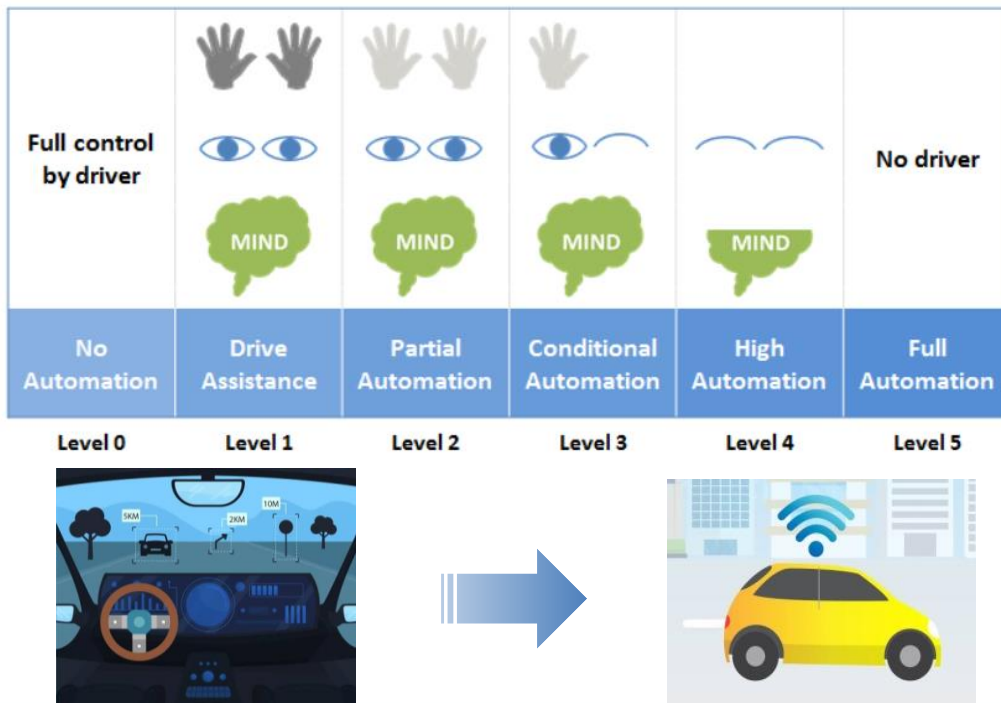
**Battery Charging or Swapping**



**More convenient "refueling" of EVs**

# Drivers for Further EV Adoption (2/5)

## Autonomous Driving/Vehicles



Source: Level of driving automation, SAE International; Automated Vehicles for Safety, National Highway Traffic Safety Administration; SAE International Ready To Tackle Automated Vehicle Safety Testing Standards, Forbes (1 Aug 2018)

# Drivers for Further EV Adoption (3/5) On-demand & Sharing E-mobility



Photo taken  
in Berlin -  
sharing  
Segway



- BlueSG: 1,000 sharing EVs and 500 charging stations in Singapore (100 stations opened as at Oct 2018)
- VW will provide 2,000 sharing EVs in Berlin starting from Q2 2019



Photo taken  
in Berlin – sharing  
e-scooter (A  
Vattenfall-Emmy  
partnership)



Ford GoBike added in  
Apr 2018 250 power-  
assisted e-bikes to its  
bike sharing fleet in  
San Francisco

# Drivers for Further EV Adoption (4/5)

## Regulations & Policies

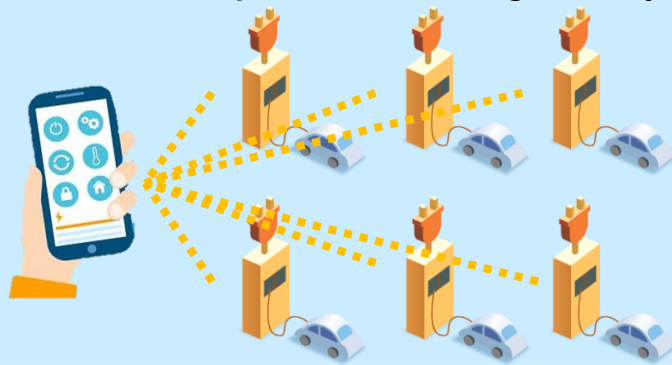
### Banning on Sales of Fossil Fuel Vehicles

Region	Ban by	G: Gasoline D: Diesel	
Austria	2025	G+D	
Denmark	2030	G+D	
France	2040	G+D	
Germany	2030	G+D	
Hong Kong	TBC	D	
India	2030	G+D	
Netherlands	2030	G+D	
Norway	2025	G+D	
United Kingdom	2040	G+D	

### Incentives for EV

- Tax/levy waivers for owning EVs
- Incentives for EV charging infrastructure
- EV user incentives/privileges

**Clarity of policies, legislations, regulations and insurance for personal & sharing mobility**



Source: Internet research

# Drivers for Further EV Adoption (5/5) Energy Transition & Digitalisation

- Continuous decarbonisation of power sector (use of more natural gas and low-carbon means for power generation) further reduces emissions “from EVs” at energy sources
- Electrified mobility devices are becoming distributed energy resources (DERs) using V2G technology, which will be better integrated with the smart grid



# Concluding Remark – A Visionary Picture of EV





**Thank You**