



APAS
汽車科技研發中心



50KW EV Quick Charger

HKPC TechDive: Smart City – EV Technology

27 May 2020

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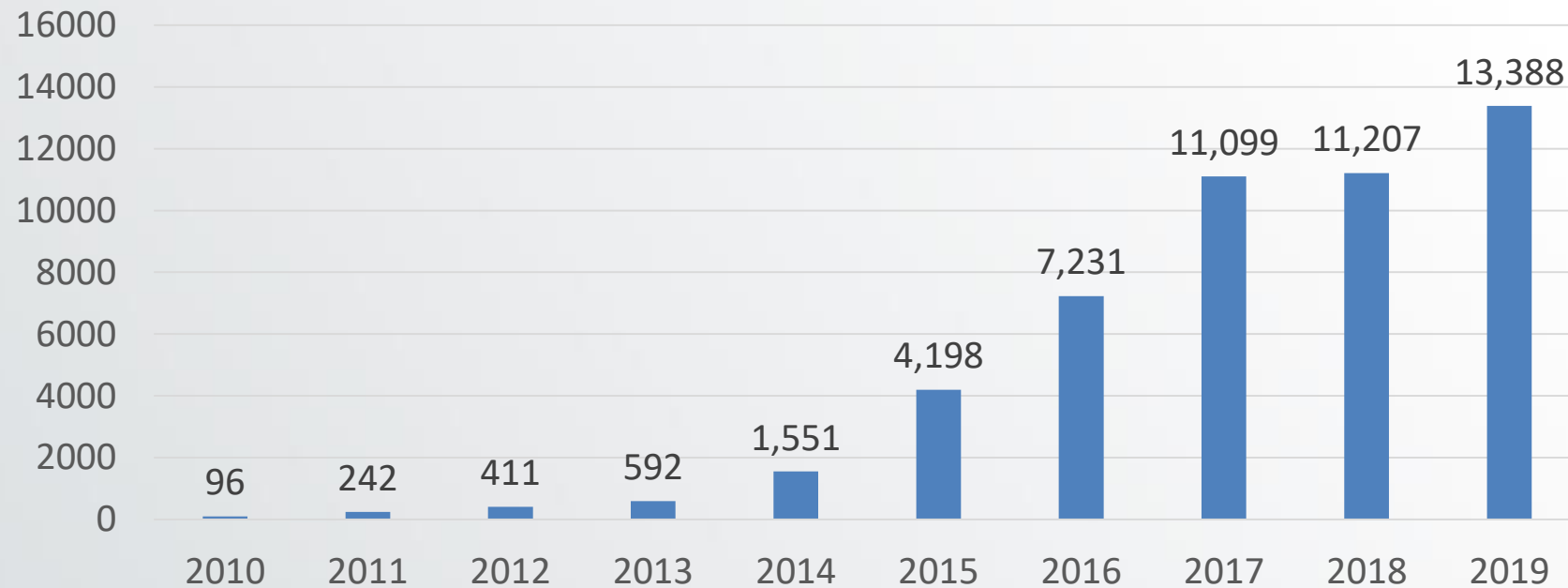
Automotive Platforms & Application Systems R&D Centre

Hong Kong Productivity Council



Electric Vehicle in Hong Kong

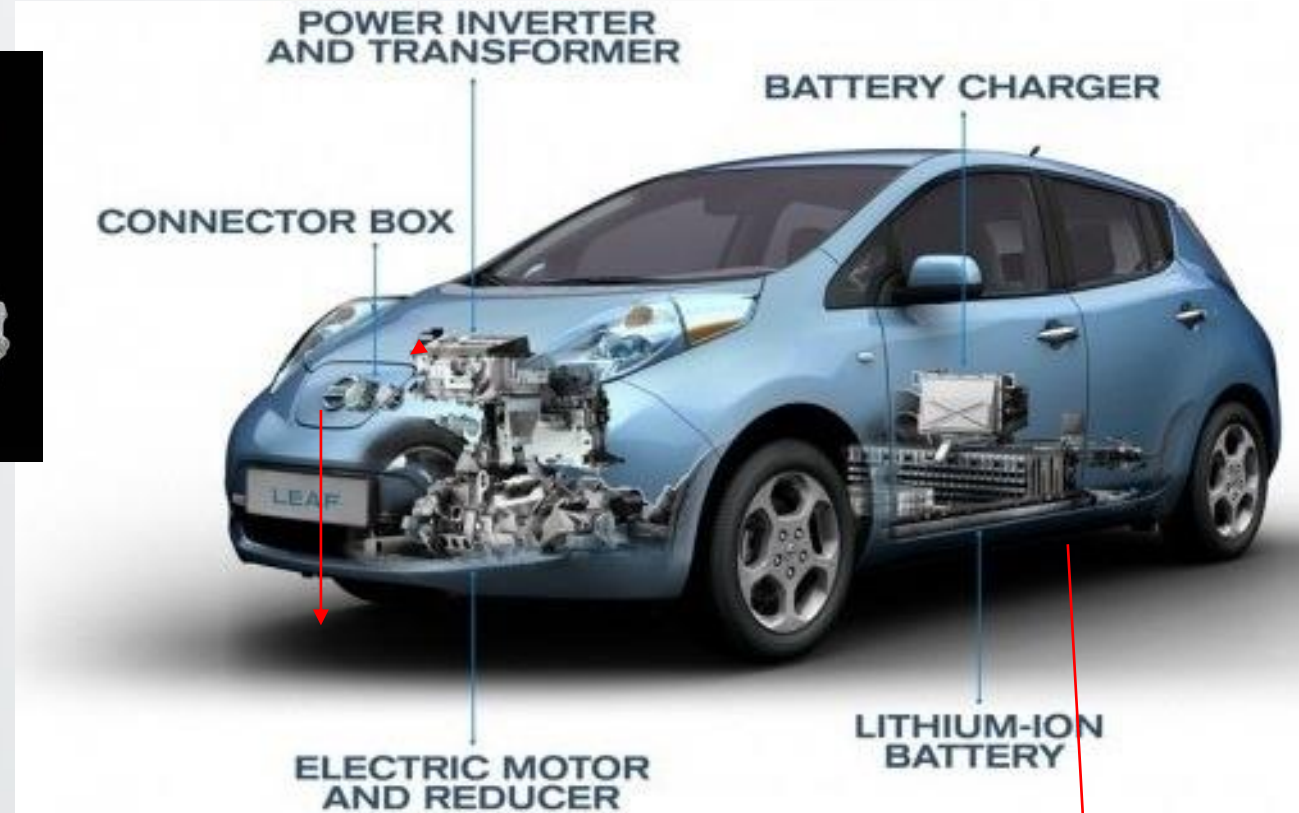
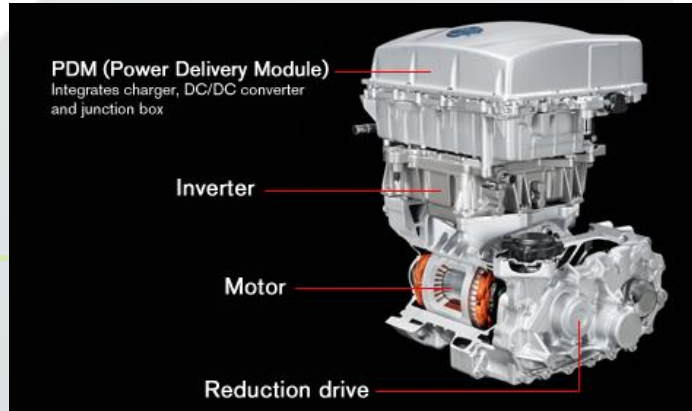
Number of EVs In Hong Kong



- At present, 118 EV models have been type-approved by the Transport Department. These include **87 models for private cars** and motorcycles, **31 models for public transport and commercial vehicles**.

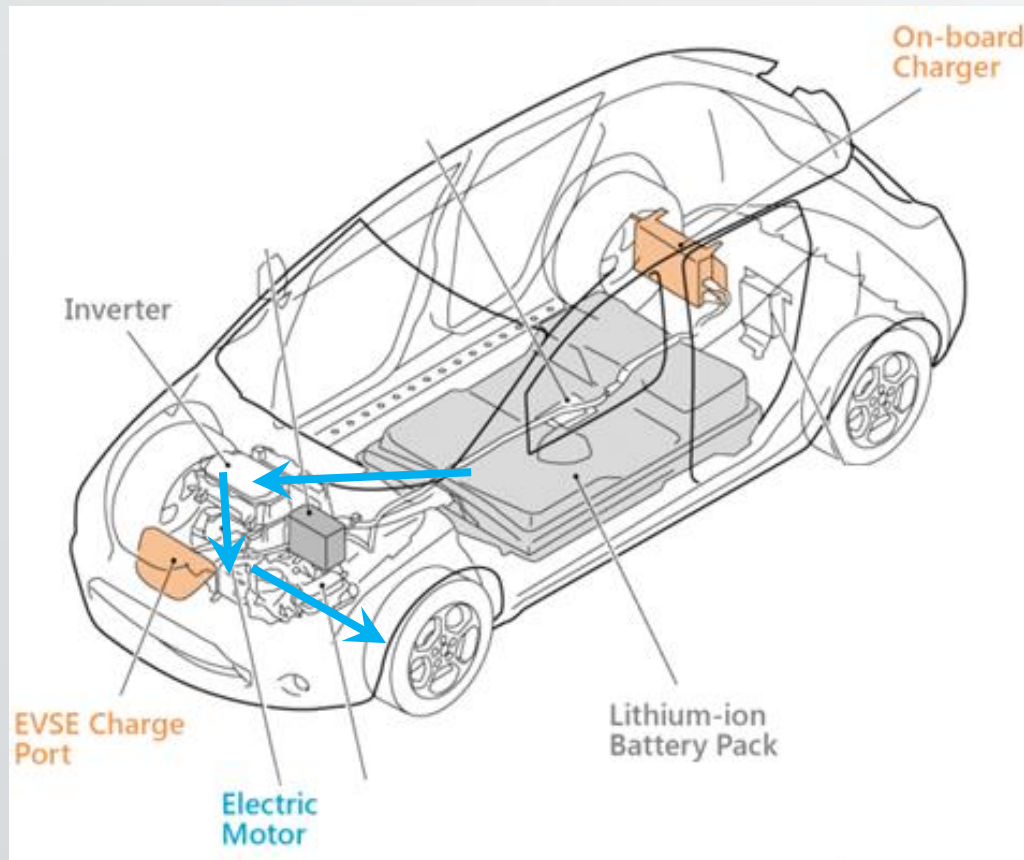


Electric Vehicle Basics

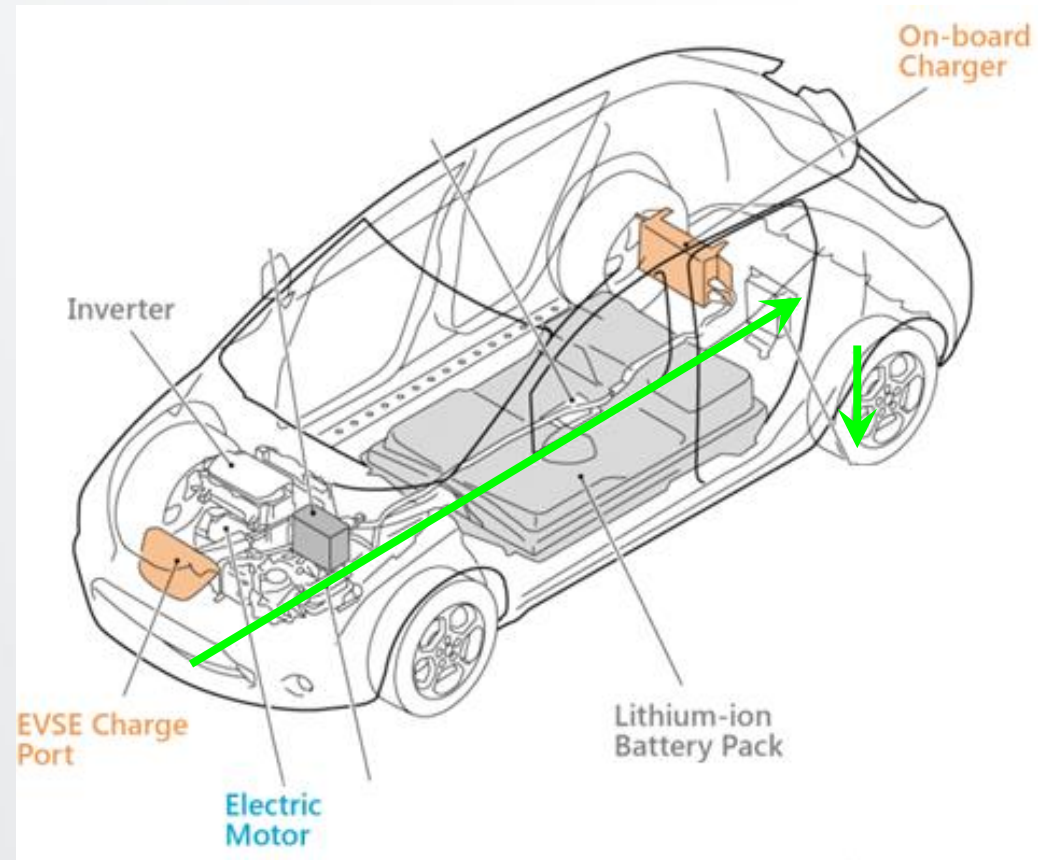


Electric Vehicle Basics

Discharging

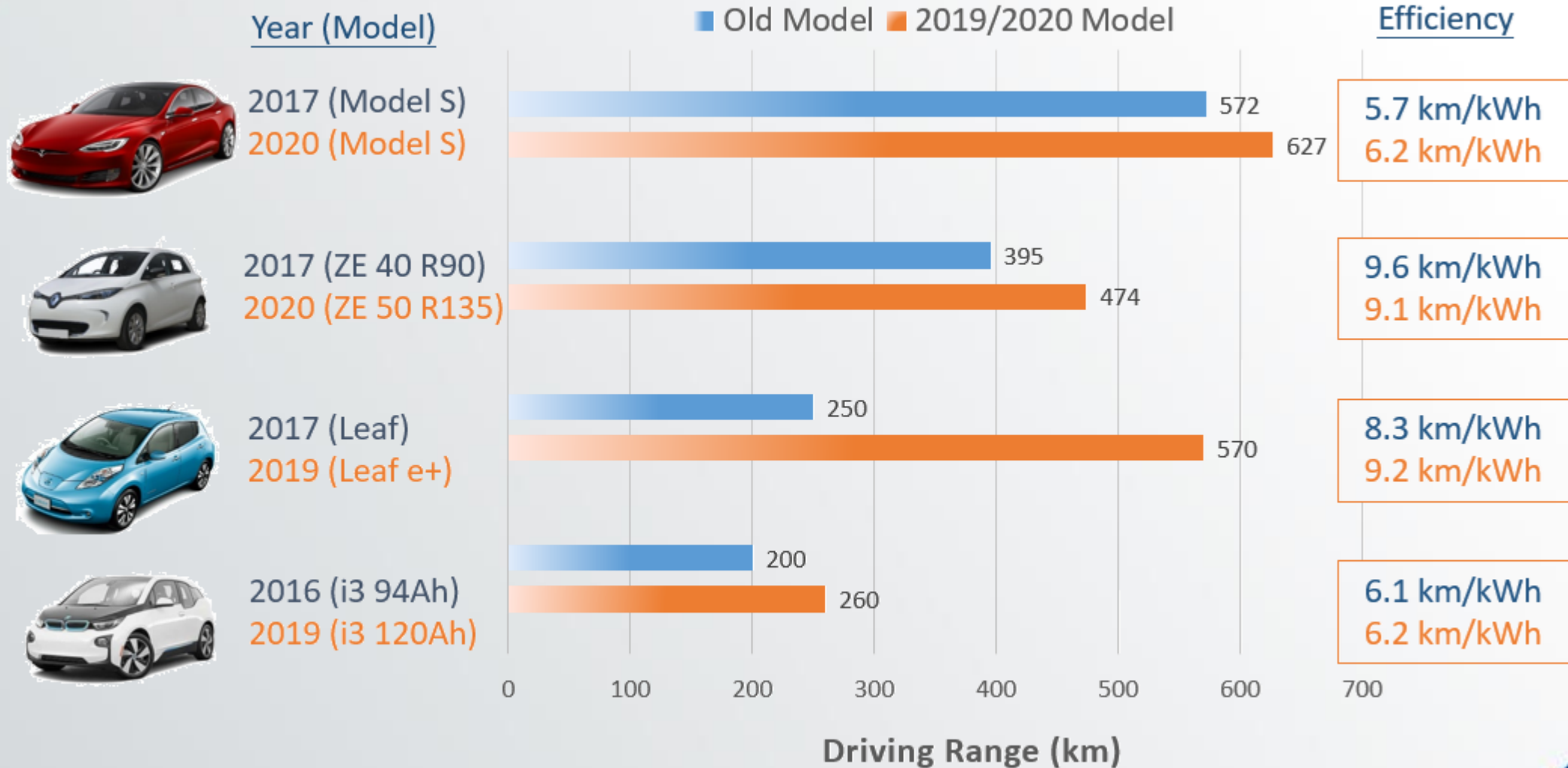


Charging



Electric Vehicle Basics

Higher battery capacity for longer driving range



Electric Vehicle Charging Types

- Communicating with EV for battery recharge
- Provision of safety protection, e.g. overload, short-circuit, current leakage



Standard標準



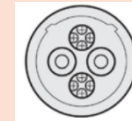
- Domestic plug and socket
- Low cost, but not practical for long term development



Medium中速



- Most EV models in HK support IEC standard via suitable cable
- Suitable for large scale installation

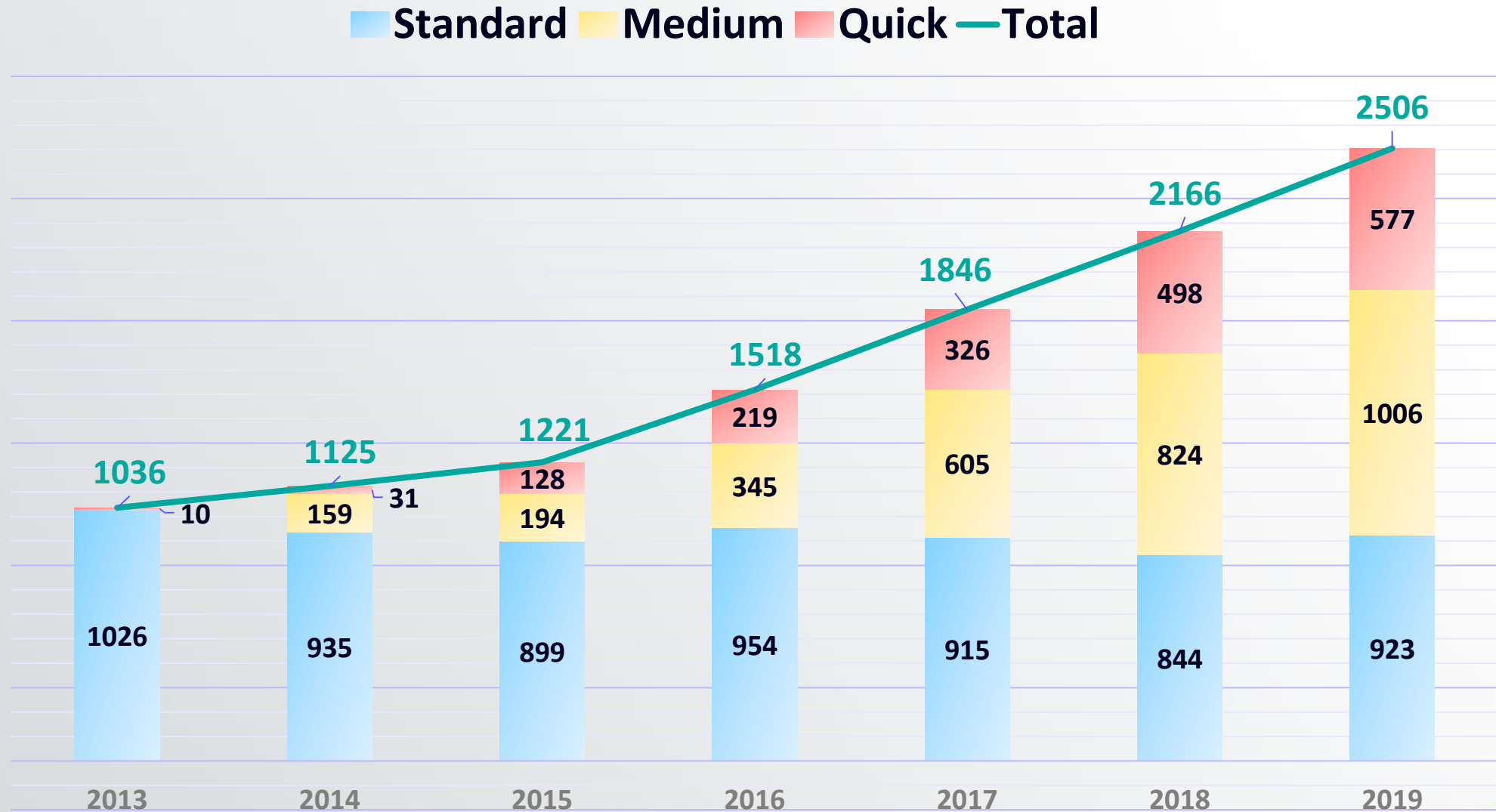


Quick快速



- Standards not yet harmonised
- Required high power supply, suitable for Opportunity Charging

Public EV Chargers in HK



AC Medium Chargers

- Charging power: 3.3kW – 21kW
- Typically 7kW (1-phase 32A) or 21kW (3-phase 32A) in HK
- Compliance of IEC 62196 or SAE J1772
- Deployed >500 charging points in 70 sites since 2012



機電工程署
EMSD



香港國際機場
HONG KONG INTERNATIONAL AIRPORT

CLP 中電

HONG KONG HOUSING SOCIETY
香港房屋協會

HONG KONG
Disneyland

新鴻基地產
Sun Hung Kai Properties

港燈
HK Electric

Autotoll
快易通

Quick Charging

➤ Not compatible with each other

Europe & U.S. CCS Combo



SAE DC Combo (Combo 1)



IEC DC Combo (Combo 2)

China GB

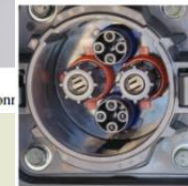


GB 20234.3 DC Vehicle Connector
and Vehicle Inlet

Japan CHAdeMO



CHAdeMO Vehicle Connector



CHAdeMO Vehicle Inlet

Tesla Supercharger



50kW EV Quick Charger

Emergency stop

Stop charging immediately

Fast charging (Combo)

Output: DC 500V/125A max

Touch screen control panel
and operation status display

Fast charging (CHAdemo)

Output: DC 500V/125A max

Medium speed charging (IEC 62196)

Output: AC 220V/32A



50kW EV Quick Charger – Power Converter



Main Power Converter
Dimension: 100 x 80 x 180cm



**Fast charge
(Combo) connector**



**IEC62196
(medium fast) connector**



**Fast charge
(CHAdeMO) connector**

Product Features

CHAdeMO DC smart fast charging

- Output voltage range: 50~500V
- Maximum output current: 125A

Combo DC smart fast charging

- Output voltage range: 50~500V
- Maximum output current: 125A

IEC Medium speed AC charging

- Output Voltage: 220V@50Hz
- Output current: 32A

Three AC power inputs

- Three-phase 380V@63A

Touch-screen

- Easy-to-use user interface

Fast Charge Tesla EV by adapter



- Fast charge by using Tesla's CHAdeMO adapter – 60 to 80 mins charge to full



Impact and Advantages

- This quick charger provides great convenience and efficient EV usage for drivers
- Offer a complete quick charge solution for both Japanese and European electric vehicles in market

Market Potentials and Business Opportunities

- Public charging stations (e.g. shopping centers, public car parks, highways)
- Private car parks
- Public transportation and commercial fleets

Benefits of Technology Transfer/Licensing

- APAS can customize the specifications and functionalities of the quick charger to fulfill customers' requirements
- The project expenditure could be subsidised by HKSAR Government

Deployment and Trial

- Deployed in various government departments
- Cover all market available EVs in Hong Kong
- Total charged > 9,000kwh (度電)



HONG KONG
HOUSING SOCIETY
香港房屋協會



Hong Kong International Airport



Housing Society –
Kai Tak Garden



Water Service Department



HK Police - Shatin



Tamar Central
Government Office

Mobilized EV Charger

- Flexible in any EV standards, models, fast or medium charging
- Fast charge 6 to 8 mins to get 20km
- Roadside emergency charging services
- No more range anxiety





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