# Environment and Ecology Bureau

The Government of the Hong Kong Special Administrative Region
of the People's Republic of China

## Project Chambers Luncheon

## 20 October 2023

# Hong Kong's Climate Action Plan 2050


Dr Kenneth Leung
Principal Assistant Secretary (Air Policy)



Super Typhoon

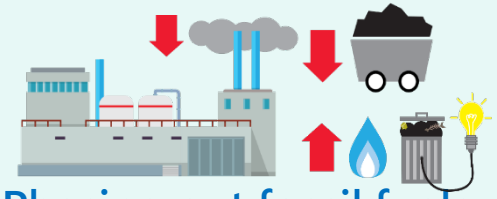
Heavy Rainfall

Rising Sea Level

Extreme Heat

# Challenges brought by climate change

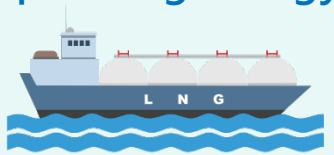
## Global developmental trends



Phasing out fossil fuels

Electrification of road transport and active development of other forms of new energy transport

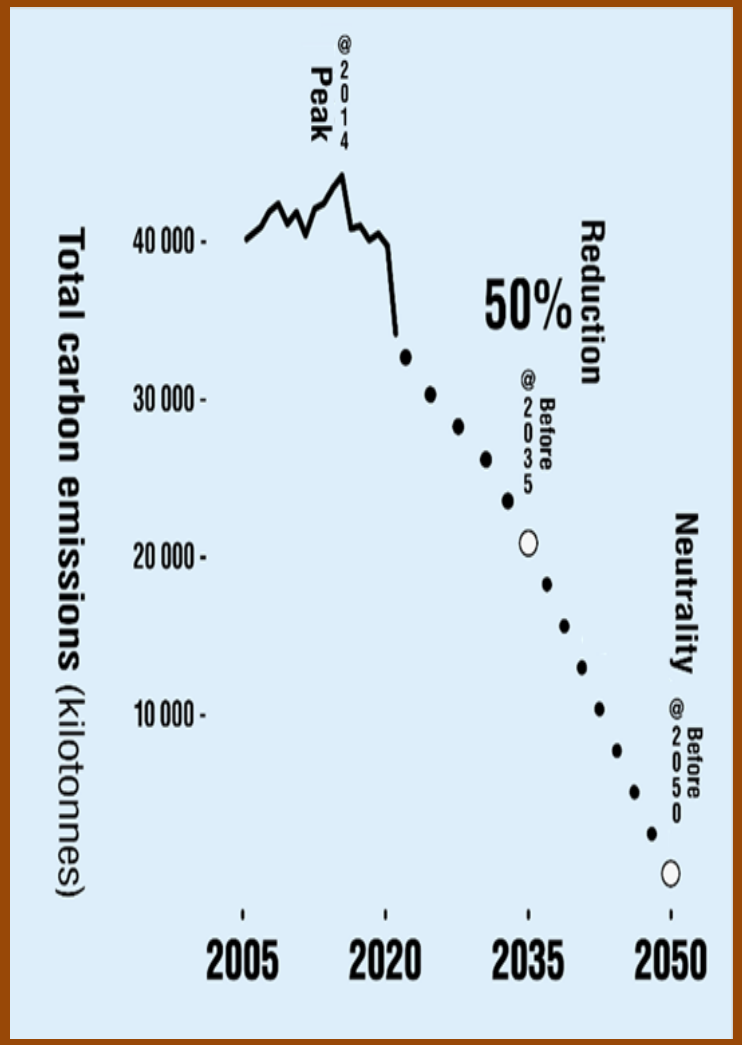
Expediting energy transformation





Alternate marine and aviation fuels

# Hong Kong's Carbon Neutrality Targets

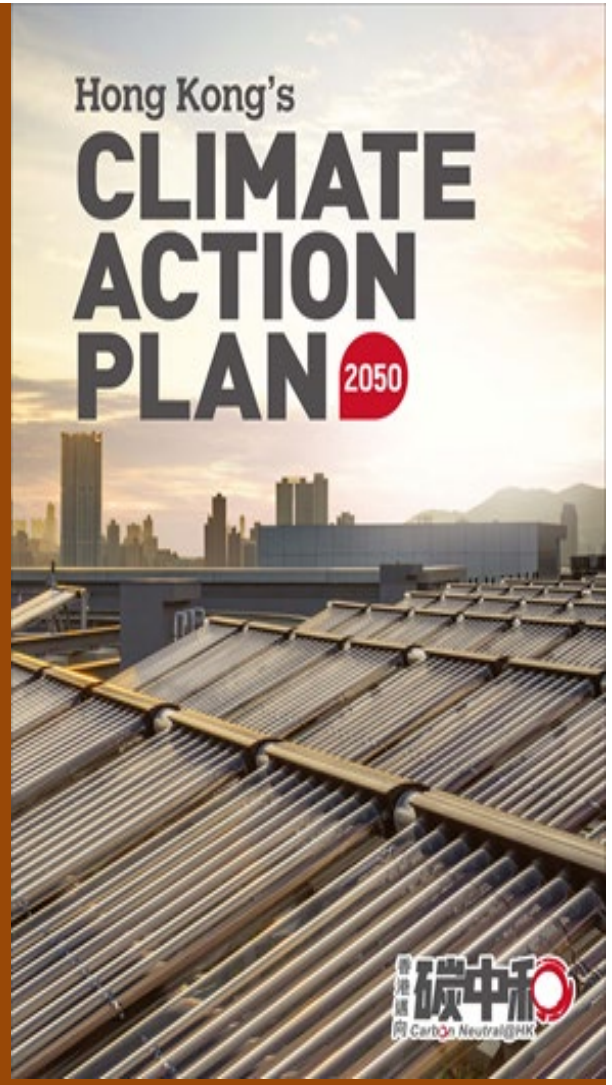



Strive to achieve carbon neutrality before 2050

Reduce total carbon emissions by half before 2035 from the 2005 level

$240 billion

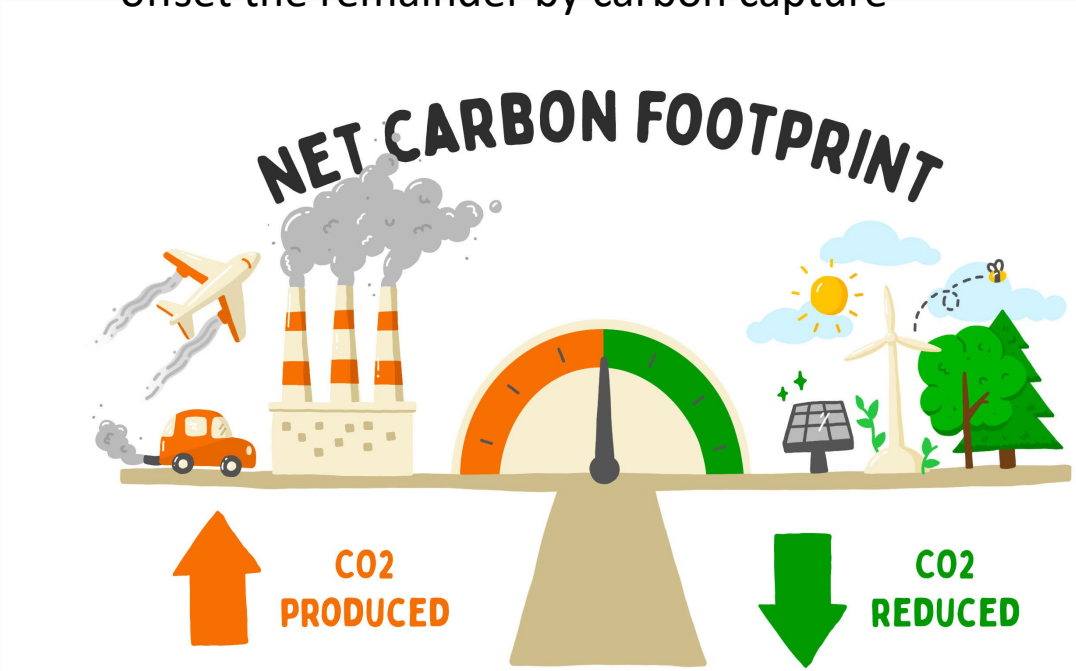
Support mitigation and adaptation measures in the next 15 – 20 years



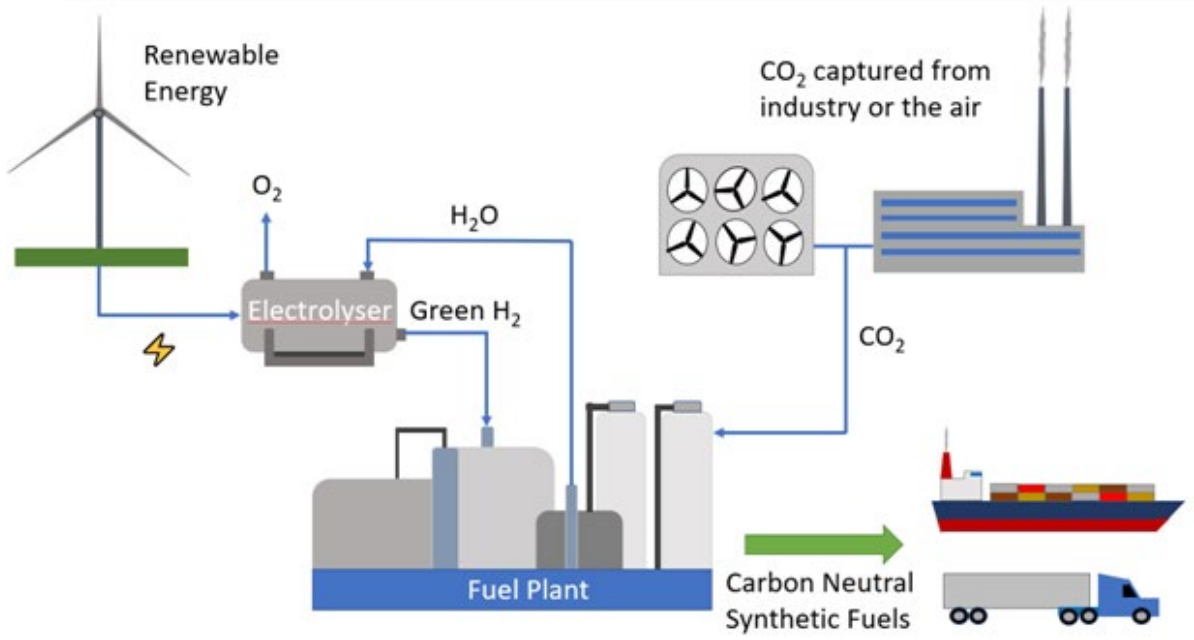
# How to Achieve Carbon Neutrality

Net-zero emission

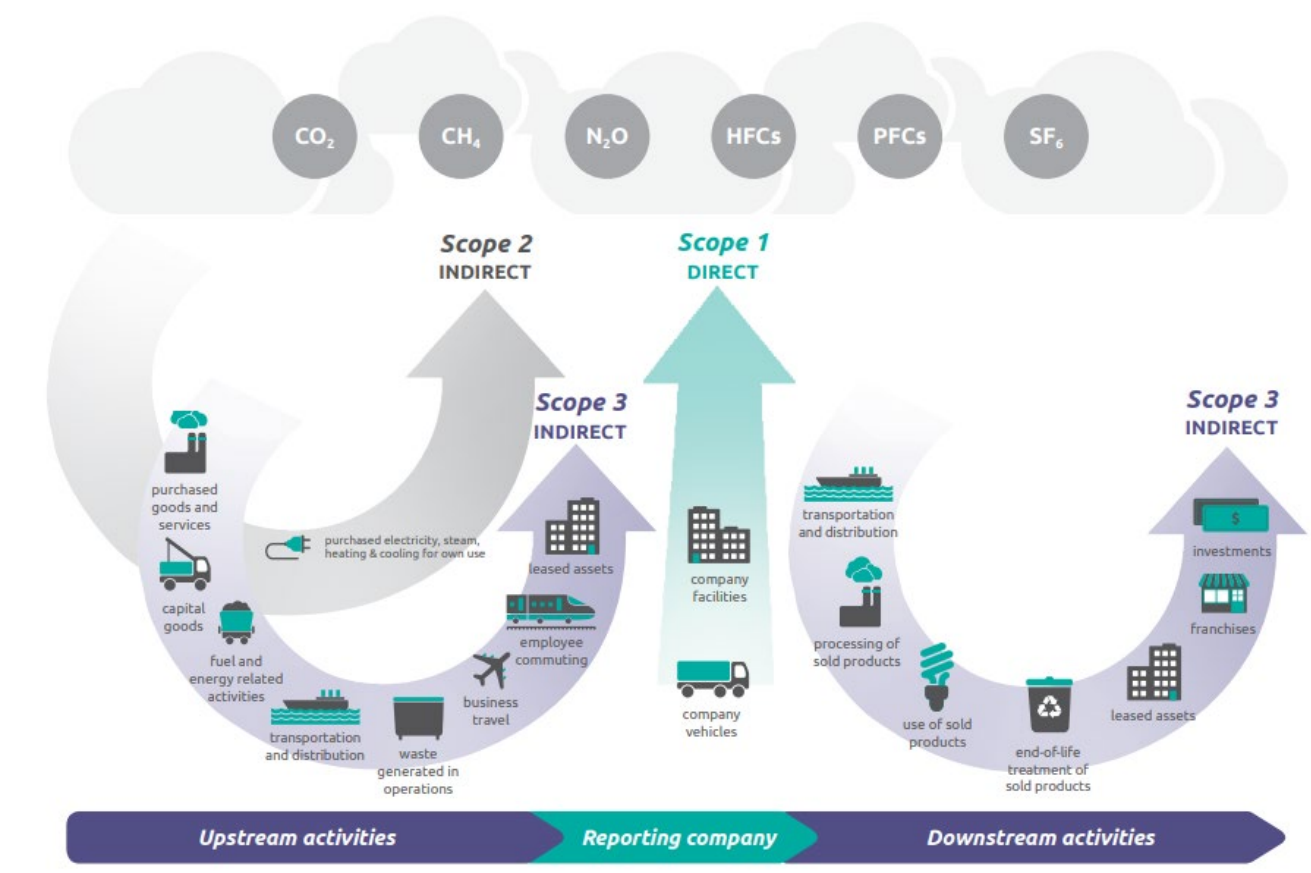
- reduce carbon emissions as much as possible
- offset the remainder by carbon capture




Carbon Neutral synthetic fuels



# Scope 1, 2 and 3 Carbon Emissions




*Extracted from Green House Gas Protocol*

## Scope 1 emissions

These are “direct” emissions – those that a company causes by operating the things that it owns or controls. These can be a result of running machinery to make products, driving vehicles, or just heating buildings and powering computers.

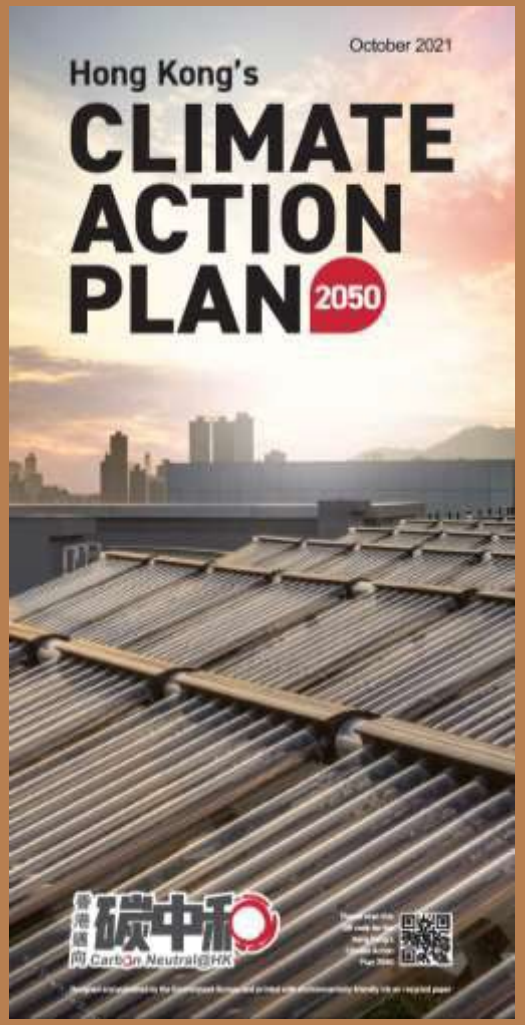
## Scope 2 emissions

These are “indirect” emissions created by the production of the energy that an organization buys. Installing solar panels or sourcing renewable energy rather than using electricity generated using fossil fuels would cut a company’s Scope 2 emissions.

## Scope 3 emissions

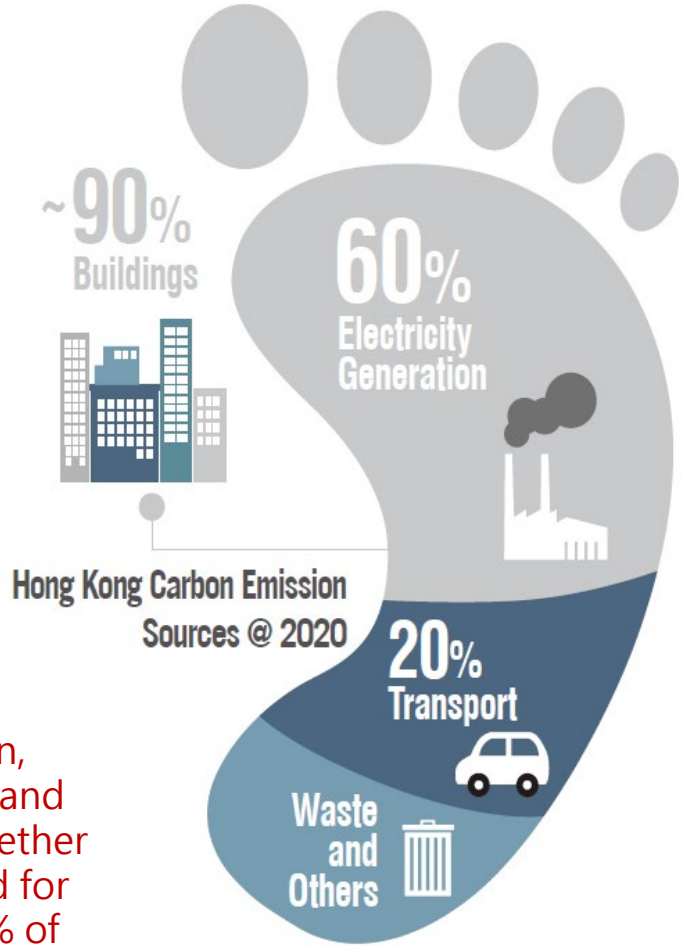
These are also “indirect” emissions – they cover those produced by customers using the company’s products or those produced by suppliers making products that the company uses.

# Four Decarbonisation Strategies




- Net-zero Electricity Generation
- Energy Saving and Green Buildings
- Green Transport
- Waste Reduction

## Sources of Carbon Emissions in Hong Kong




**$CO_2$ emissions**
**Coal: 12 M tonne**
**LNG: 9 M tonne**

Electricity generation, transport and waste together accounted for about 90% of the total emissions

## Reduce coal for electricity generation

Stopped building new coal power plants since 1997. The share of coal for electricity generation was less than a quarter in 2020

# Net-zero Electricity Generation

2035

### Cease using coal

Phase out coal for electricity generation

2035

### Renewable energy (RE)

Increase RE share to 7.5-10% of fuel mix by 2035, and increase to 15% subsequently

2035

### Zero-carbon energy

- Study the potential of hydrogen-fueled power generation
- Trial of new energy and Regional cooperation

2050

### Net-zero carbon emissions before 2050



## Electricity Saving

About 2.1 billion kWh of electricity saved in 2020 compared with 2015 (- 4.7%)

# Energy Saving and Green Buildings

## Ambitious energy saving targets

**2035**

Electricity Consumption (Compared with 2015)

**COMMERCIAL BUILDINGS 15-20%**

(Reduce by 30-40% subsequently)

**RESIDENTIAL BUILDINGS 10-15%**

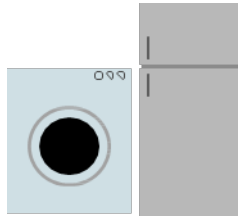
(Reduce by 20-30% subsequently)

## Green Government Buildings

Improve the overall energy performance by more than 6% by 2024-2025.
District Cooling System in Northern Metropolis

## Legislative amendments

Save 17% further by expanding the scope of Mandatory Energy Efficiency Labelling (MEEL) schemes



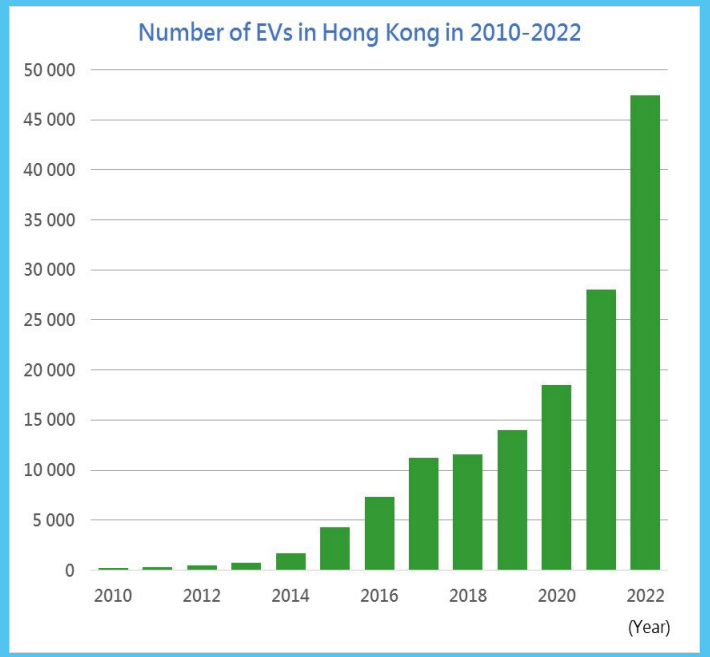
# Electric private car growth sharply

TAX

First Registration Tax Concession

2022

One out of every two newly registered PCs is an EV


# Green Transport

## Trials on Electric Public Transport

新能源運輸基金 New Energy Transport Fund

**NET fund subsidize 1.1 billion to trade for new energy CVs and vessels trial**

163 electric goods vehicles, e-taxis, e-buses, e-coaches, e-motorcycle, e-vessels on trial


## Major policies and measures

2023

**Hydrogen Vehicles**

Test out hydrogen fuel cell electric buses and heavy vehicles

2025

**New energy transport**

Progressively adopt new energy ferries

A roadmap for commercial vehicles

2035

**Cease registration of new fuel-propelled and hybrid private cars**

2050

**Zero carbon emissions from transport sector before 2050**

# Green Transport - KPIs

## KPIs

**2023**

Test out of **Hydrogen fuel cell electric (HFC) double-deck buses and heavy vehicles**


**2024**

Test out **electric ferries** with all **4** in-harbour ferry operators

**2025**

Provide about additional **7 000 parking spaces with electric vehicle chargers** in government premises by 2025
(an increase in such parking spaces from 30% to 100% in government premises)


**2025**

Conduct trials for at least **180 electric commercial vehicles,** with a view to mapping out the way forward around 2025


**2027**

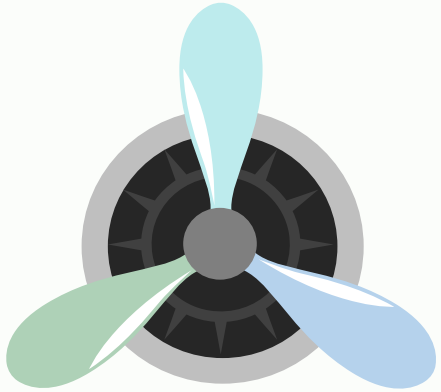
The Government targets to introduce about **700 e-buses** and **3000 e-taxis**



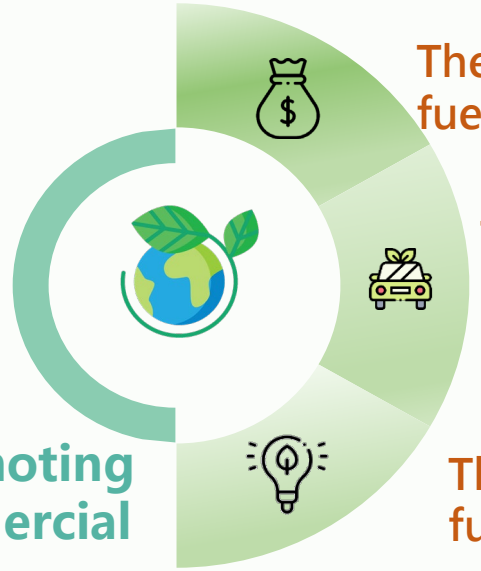
# New energy transport

Energy source

- Pure battery
- Fuel cell
- Internal combustion engine



Major fuels for exploration: Hydrogen (H2); Methanol (CH3OH); Ammonia (NH3)



The prices of the vehicle and its fuel

The availability of a stable and sufficient supply of fuel required

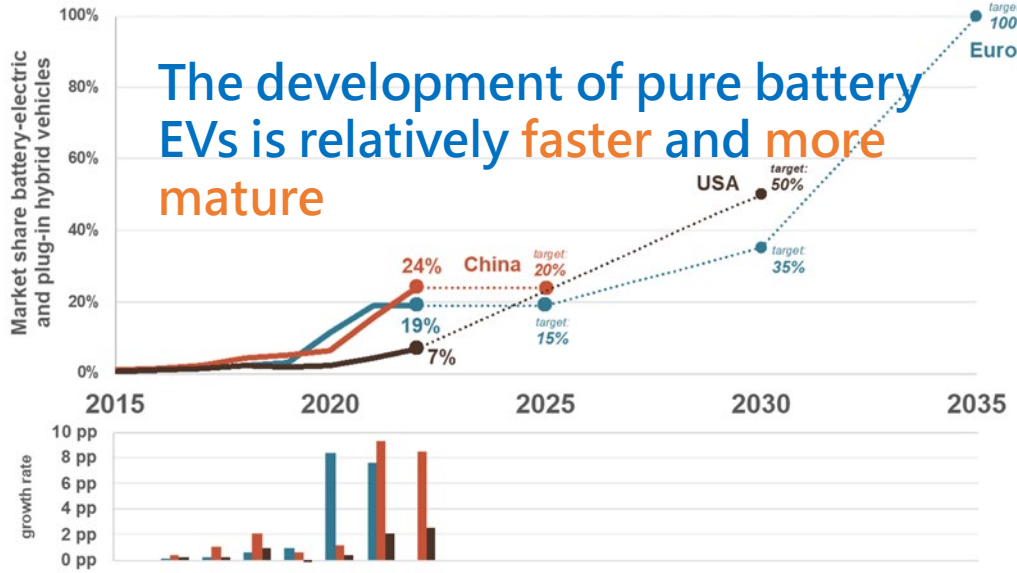
The time needed for fuelling

**Critical factors towards success in promoting the wider adoption of an electric commercial vehicle (CV)**

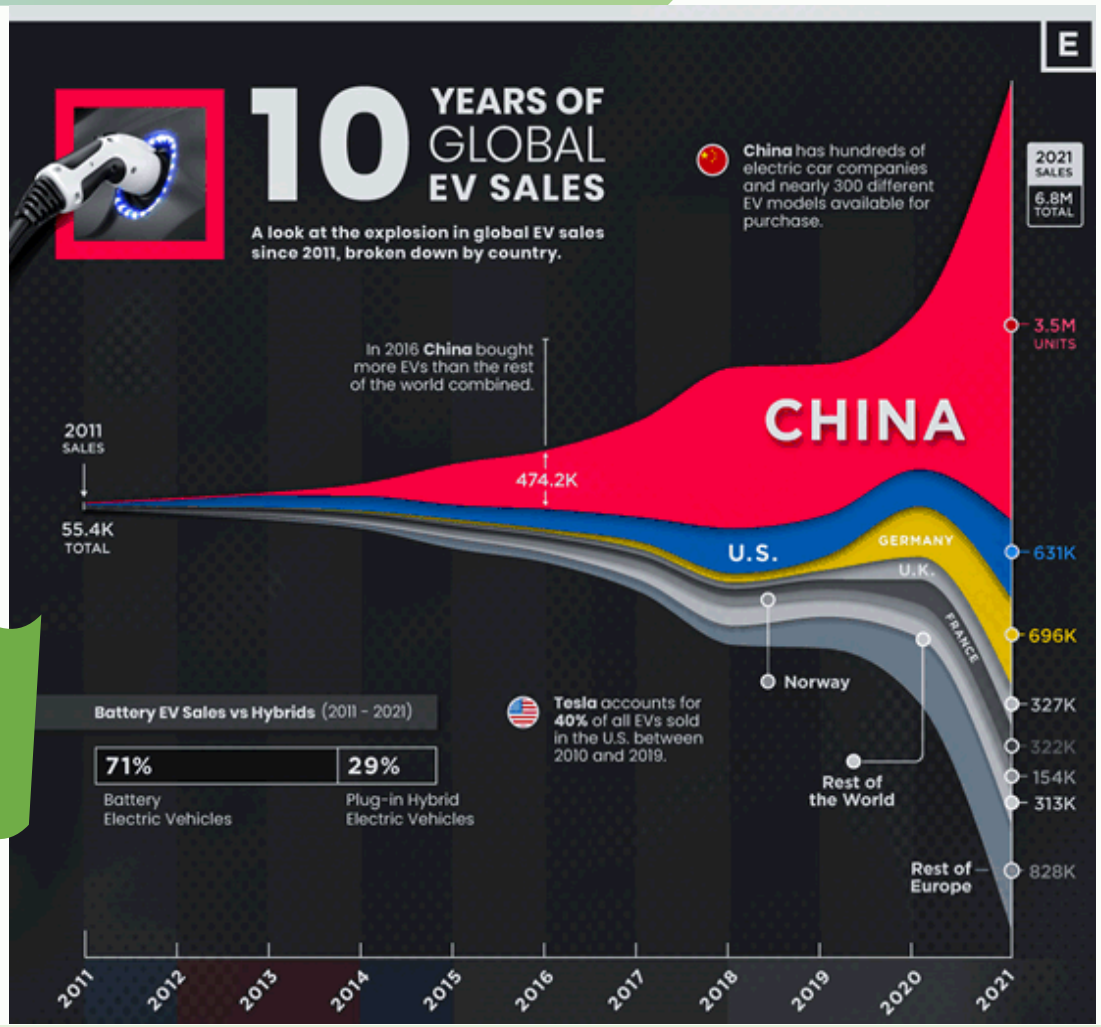
# Comparison between the global development progress of pure battery electric vehicles (EVs) and hydrogen fuel cell (HFC) vehicles

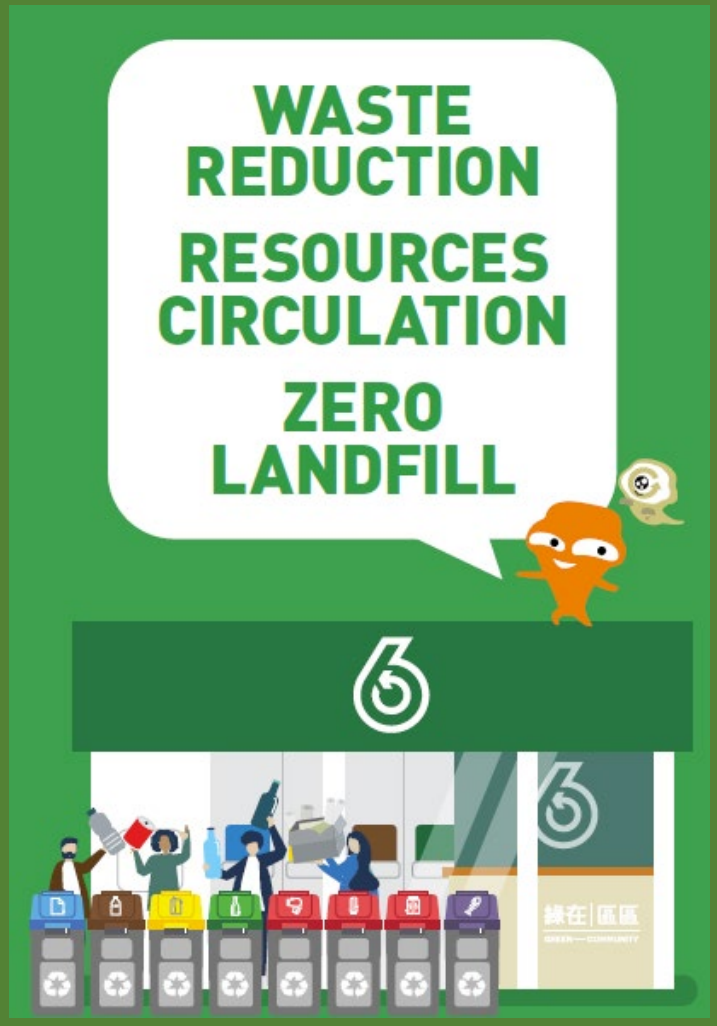
In 2021, the global sales of EVs totaled *6 800 000* units, while in the same year the global sales of HFC vehicles only stood at *16 000* units.






Especially in the Mainland China




# Waste Reduction

**2023** Implement municipal solid waste charging

**2025** Regulate disposable plastic tableware in phases

**2035** Develop adequate waste-to-energy facilities

**2050** Achieve carbon neutrality in waste management

# Hydrofluorocarbons (HFCs)

## 冷氣系統 Air-conditioning

水冷式冷水機
Water-cooled chiller

風冷式冷水機
Air-cooled chiller

室內冷氣機 (分體式或窗口式)
Room air-conditioner (split type or window type)

私家車的汽車空調機
Motor vehicle air-conditioning - Private car


大型多聯分體機
可變製冷劑流量空調系統、組合式系統
Large sized multi-split, Variable refrigerant flow (VRF)

## 冷凍系統 Refrigeration

家用雪櫃、凍櫃及雪櫃與凍櫃組合
Household refrigerator, freezer and refrigerator combined with freezer

商用冷凍設備 - 獨立系統
Commercial refrigeration - stand-alone system


商用冷凍設備 – 冷凝機組
Commercial refrigeration - condensing unit

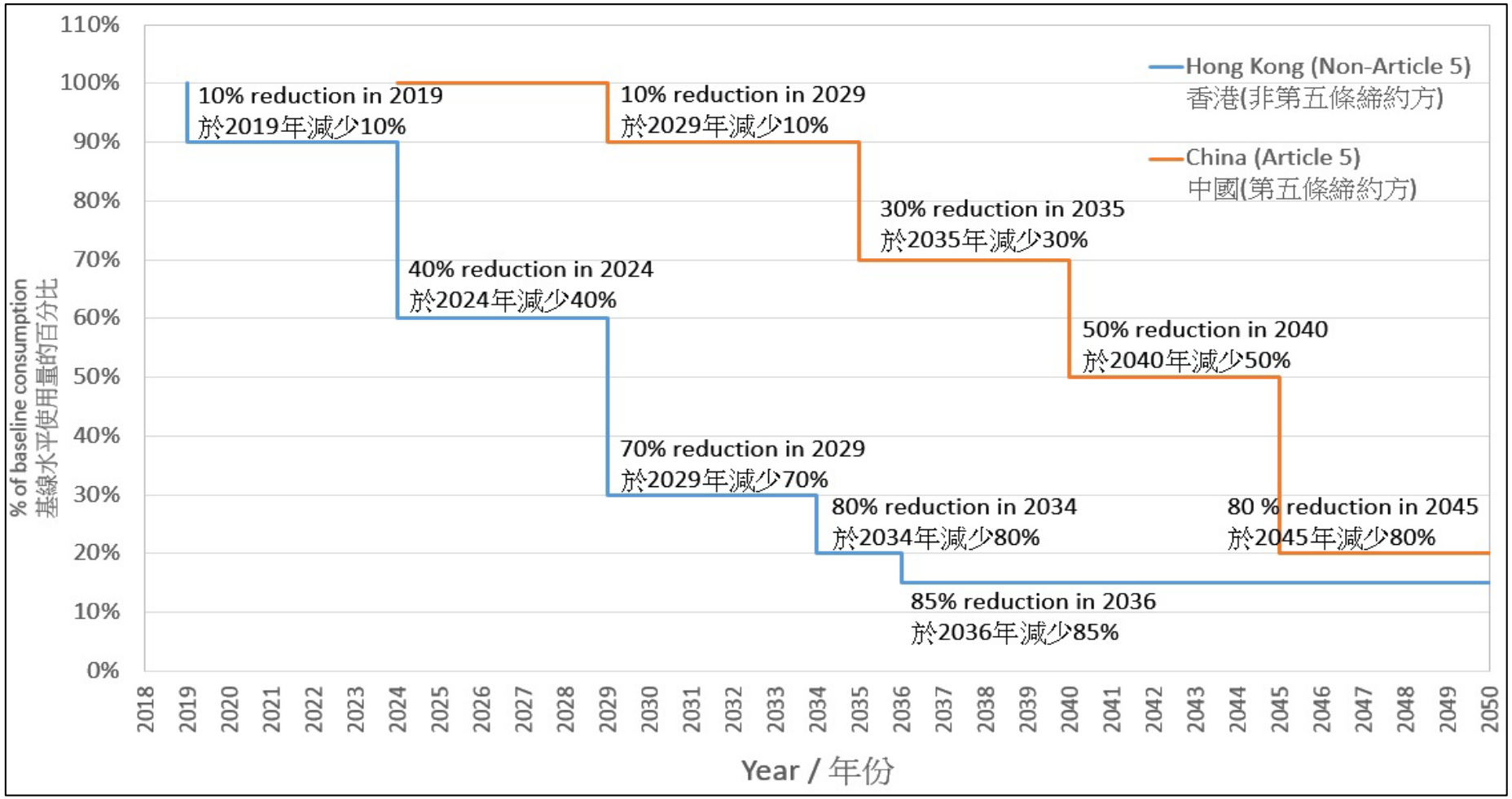
商用冷凍設備 – 超級市場系統
Commercial refrigeration – supermarket system

冷凍倉庫系統
Cold storage warehouse system

## 滅火系統 Fire protection

滅火系統
Fire suppression system

# Kigali Amendment – Phasedown Schedule of HFC

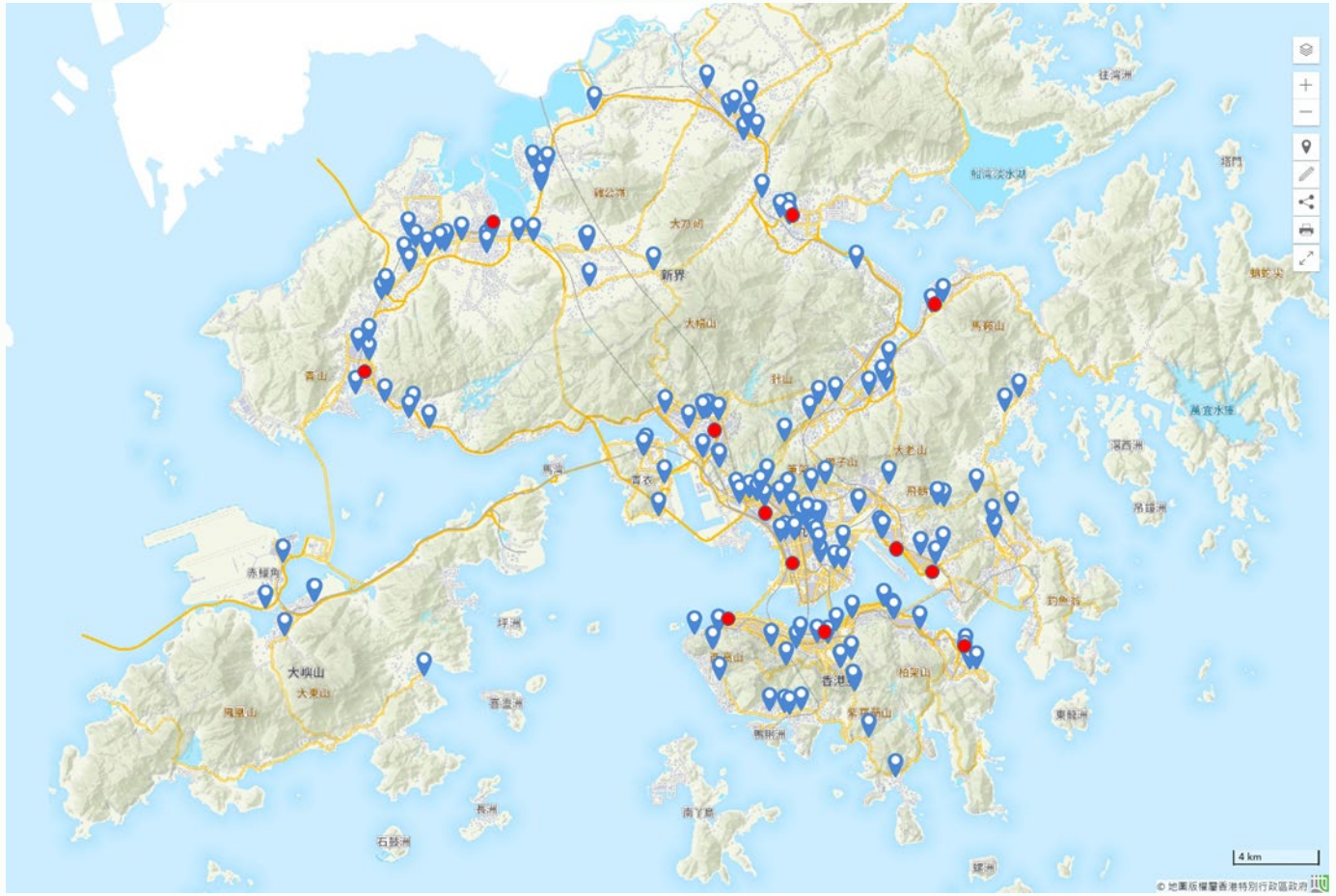



| 香港的削減時間表 **Phasedown Schedule for Hong Kong** | 單位：千公噸二氧化碳當量 **Unit: kilotonnes $CO_2$-eq** |
|---|---|
| HFC 基線<br>HFC baseline | 1682 |
| 基線的 90% (2019-2023 年)<br>90% of baseline (2019-2023) | 1513 |
| 基線的 60% (2024-2028 年)<br>60% of baseline (2024-2028) | 1009 |
| 基線的 30% (2029-2033 年)<br>30% of baseline (2029-2033) | 504 |
| 基線的 20% (2034-2035 年)<br>20% of baseline (2034-2035) | 336 |
| 基線的 15% (2036 年及之後)<br>15% of baseline (2036 and thereafter) | 252 |

- Production and consumption of HFCs measured in total $CO_2$ equivalent (i.e., net weight in metric tonnes of HFCs multiplied by their GWP).

- Consumption is defined as the production and import of HFCs into a given place, less the amount of export.

# Land Use Planning for Petrol Filling Stations




Petrol filling stations (180)

Dedicated LPG filling stations (12)

- The demand of fossil fuel will decrease
- The demand of EV charging and hydrogen filling facilities will increase
- Need to consider composite use of existing petrol filling stations


香港邁向
碳中和
Carbon Neutral@HK