

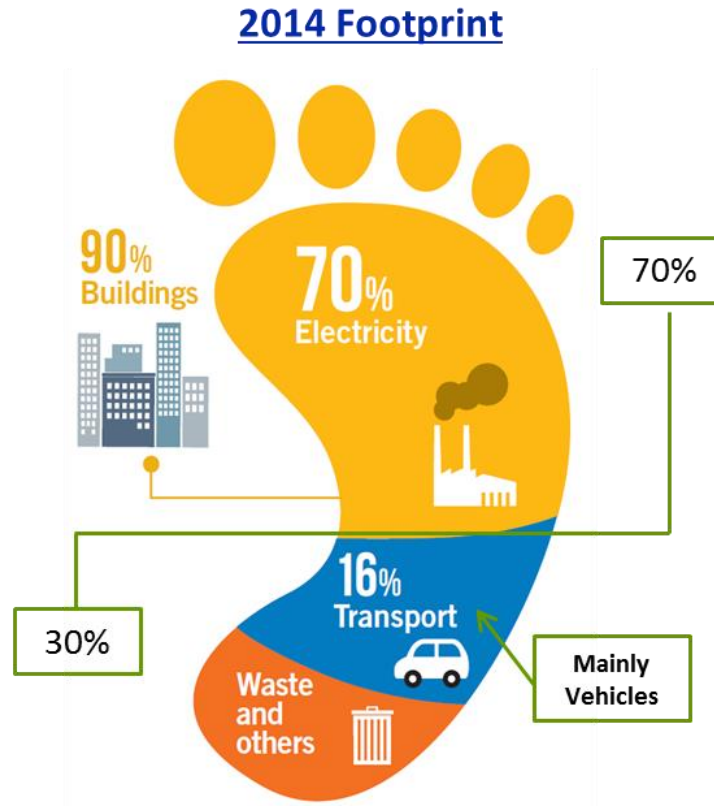
Industry Perspective: Achieving Carbon Reduction in Hong Kong

14 June 2017

Hong Kong's Carbon Situation

90%

of HK's electricity consumption related to **42,000** buildings, contributing **over 60%** of GHG emissions



44,900

kilotonnes CO_{2-e}) emitted in 2014

Air-conditioning accounts this portion of consumption

~30%

Source: Hong Kong's Climate Action Plan 2030+, EnB

CLP Power

Electricity System

8,913MW diversified Generation Capacity

Castle Peak Power Station



Black Point Power Station



Penny's Bay Power Station



Guangdong Daya Bay Nuclear Power Station



Guangzhou Pumped Storage Power Station



Robust T&D Network - **99.999%** Reliability



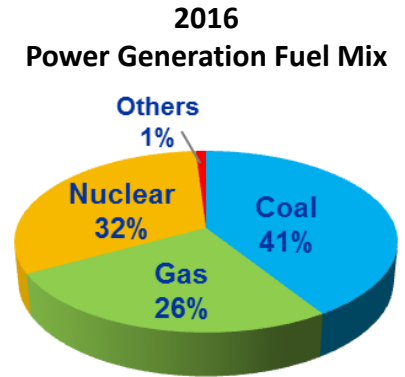
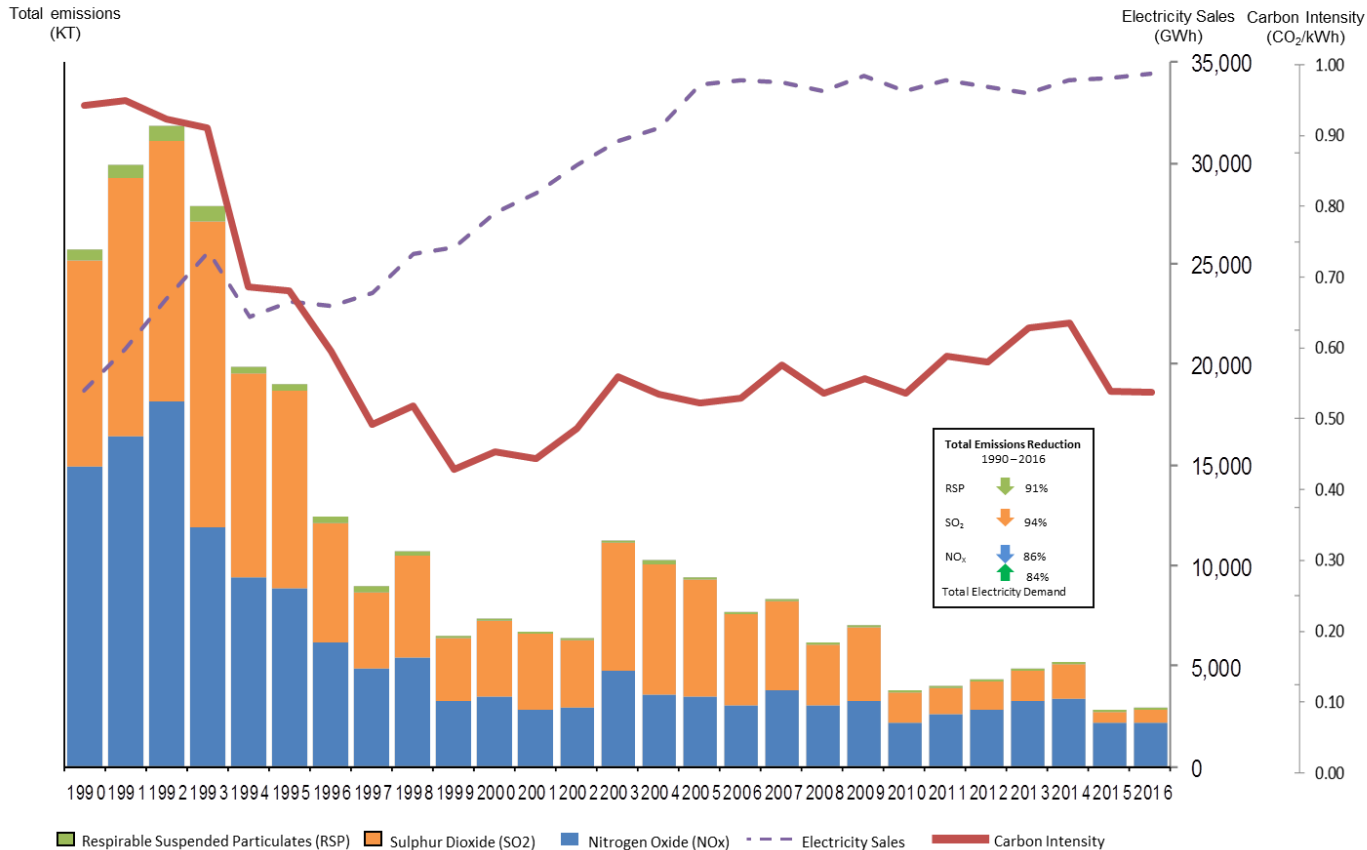
33,237 GWh*

→ supplied to
2,520,000 Customers

* 2016 Sales of Electricity

CLP supplies 75% of Hong Kong electricity needs

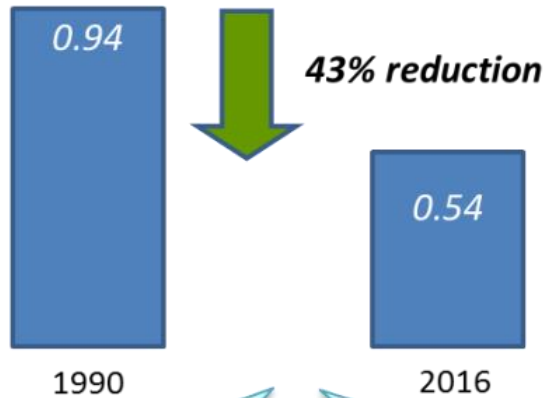
CLP's Journey to Reduce Emissions



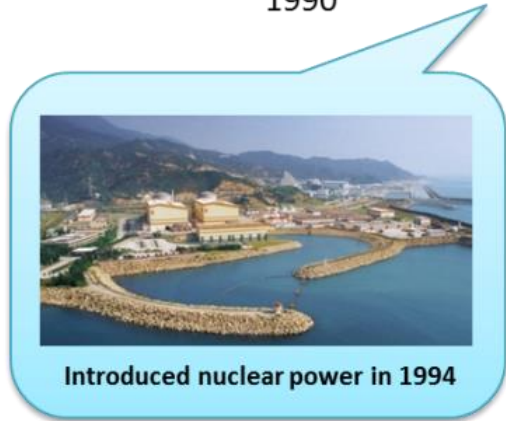
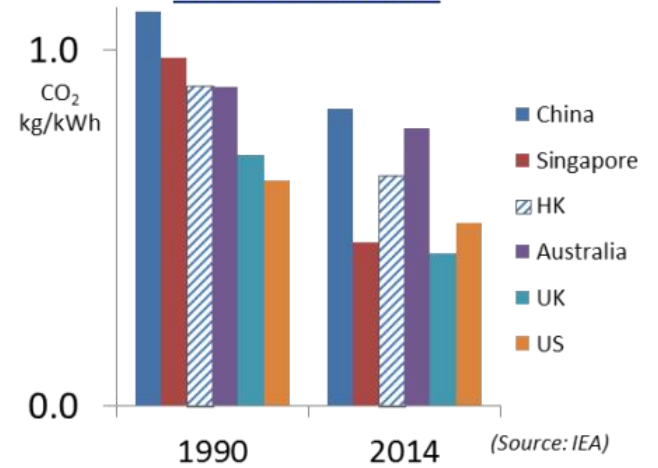
Emission levels reduced by more than 80% since 1990

How about Carbon?

CLP Power CO₂ kg/kWh Electricity

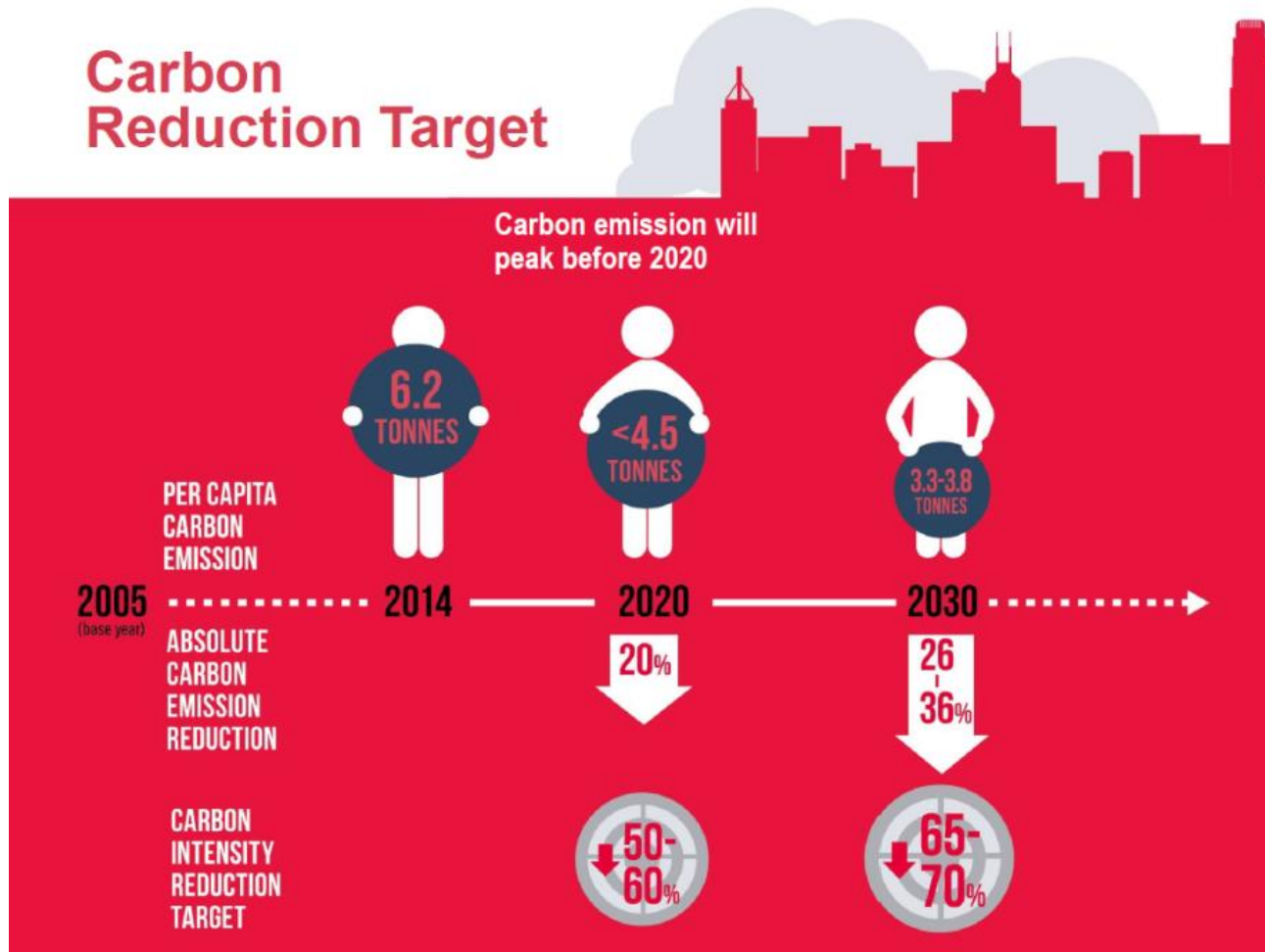


Other Countries



Despite electricity output increased by 80%, CO₂ emission increased by < 5% over this period

GoHK Carbon Reduction Targets

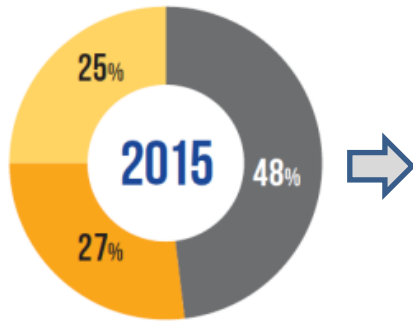


Source: Hong Kong's Climate Action Plan 2030+, January 2017

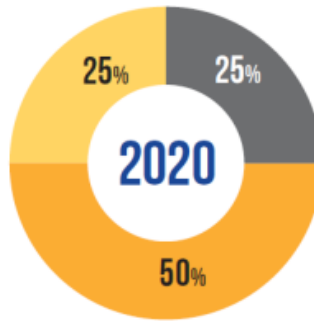
GoHK targets for 2020 and 2030

Government Tackling 70% of Hong Kong Carbon Emissions Directly Through Fuel Mix Change

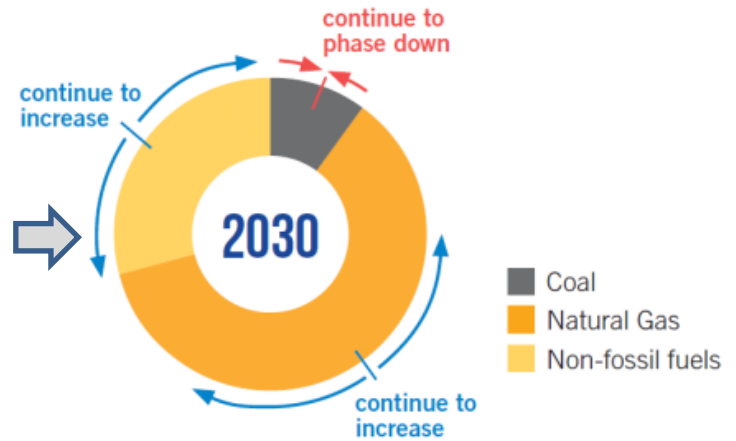
Hong Kong 2015 fuel mix



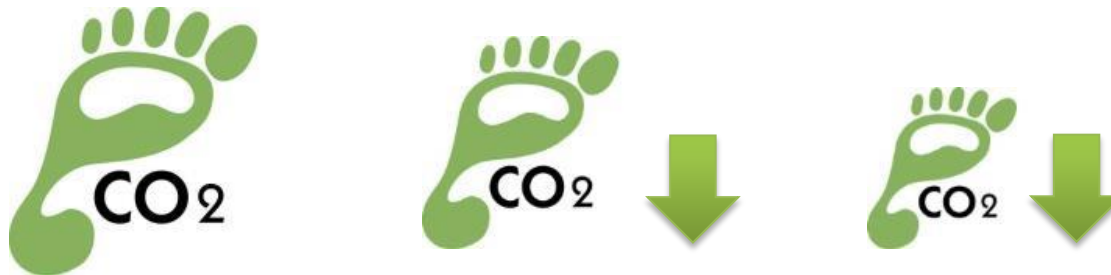
2020 fuel mix target



2030 fuel mix outlook



Source: Hong Kong's Climate Action Plan 2030+, January 2017



Government achieves carbon reduction directly through directing fuel mix under Scheme of Control (SoC)

New SoC Features for Carbon Reduction



Energy Fuel Mix

- Ensuring the right infrastructures and fuel sources in place as coal plants retire

- Feed-in Tariff
- Renewable Energy Certificates
- Incentivising Renewable Energy Connections

Renewable Energy in HK



Energy Efficiency & Conservation

- New Eco-Building Fund
- CLP Community Energy Saving Fund
- EE&C targets at 4 times of existing targets
- Demand Response target

CLP is committed to play its part in carbon reduction

Policy Instruments for Carbon Reduction

Objective:

Carbon Reduction

Different Policy Instruments:

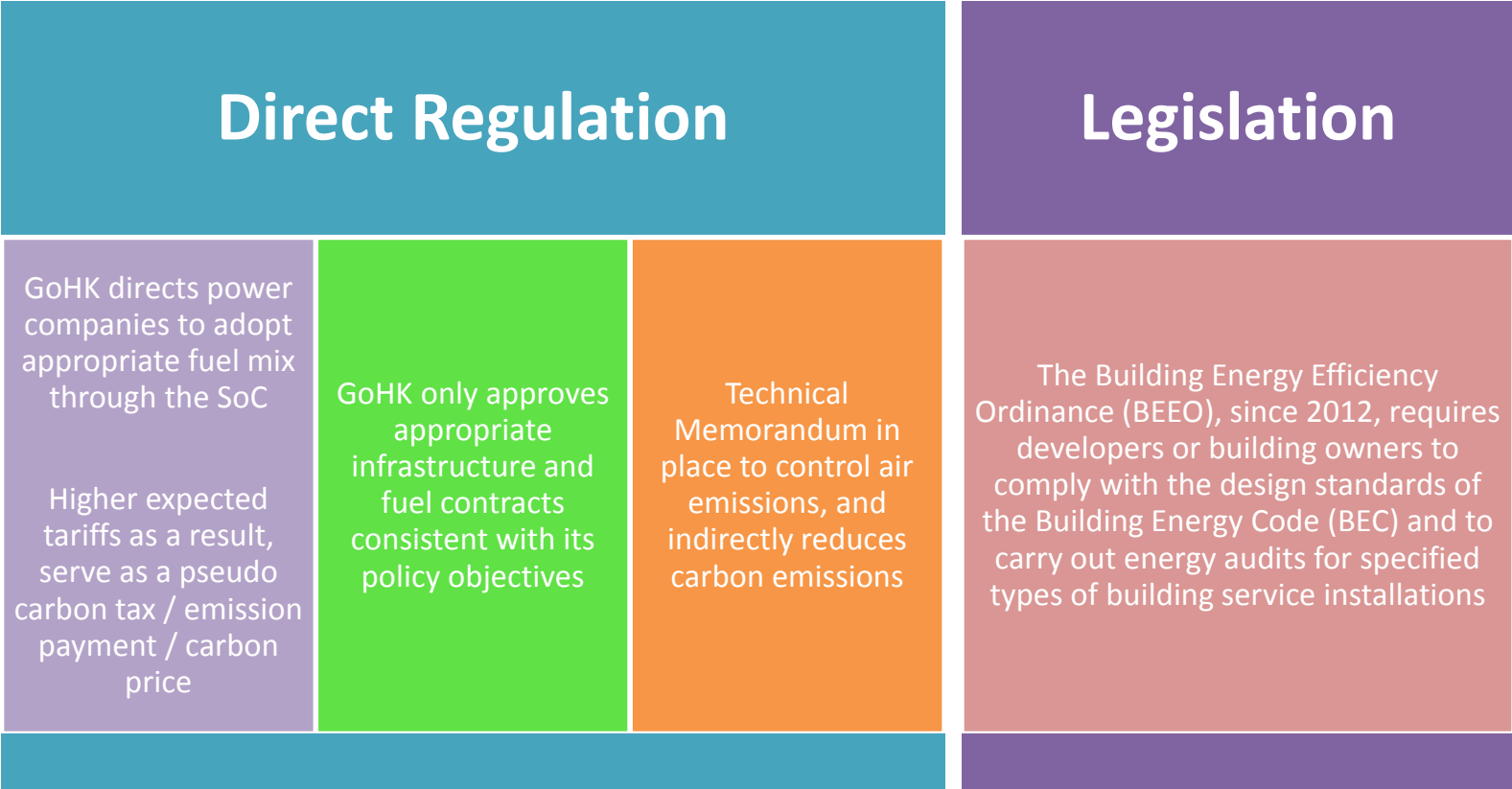


Used in Different Jurisdictions:



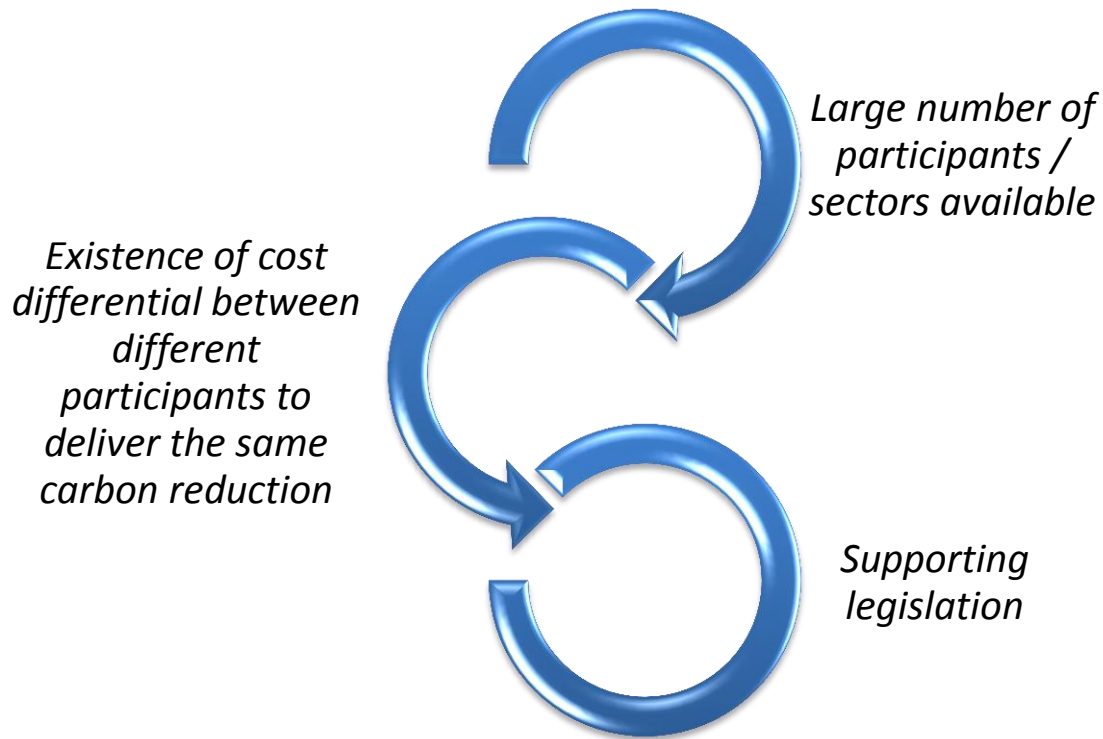
Different jurisdictions use different policy instruments to achieve carbon reduction

What Policy Instruments Are Being Used By Hong Kong?



HK power sector already on its way to contribute towards 65-70% carbon intensity reduction

Key Prerequisites for Emission Trading



Prerequisites are required for market forces to seek the lowest cost of abatement

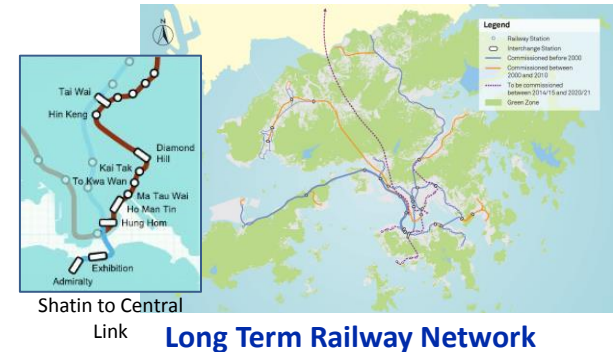
Considerations for Hong Kong's Participation in Emission Trading Scheme

- Need to be clear about the objectives. Is it for carbon reduction or other objectives?
- Pros and cons of different policy instruments
- Consistency between policy instruments
- Understanding of the design and operational details
- Ability to influence design and operational details towards achieving its stated objectives
- Recognition of different economic structure between Mainland and Hong Kong
- Stakeholders' views
- Impact to Hong Kong Community

Opportunities in Other Sectors for Carbon Reduction

Rail Extension

- Rail as low carbon public transport backbone
- Railway's share in the public transport patronage is expected to rise from ~40% at present to 45–50% by 2031



Cleaner Vehicles

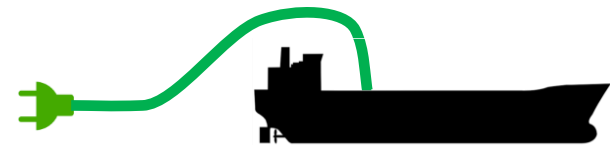
- ~16% of GHG emissions from transportation, second largest emission source
- Electric vehicles: lower carbon and ZERO roadside air emissions



EV Charging Network

Marine Transport

- Shore-to-ship power can help reduce carbon and air emissions



Deeper electrification of transportation sector will further lower HK's carbon emissions

Conclusion

- While Hong Kong transforms to a lower carbon economy, key energy policy objectives in terms of reliability, environment and reasonable cost have to be met
- For the power sector, Hong Kong is in the direction to phase down coal-fired generation upon plant retirement and replace them with more gas-fired generation and RE by 2030
- Apart from the supply side, demand side effort is also key. Energy saving is the quickest and possibly the most economic way to reduce carbon emission
- If the objective is carbon reduction, Hong Kong's direct regulation is already ensuring the right supply side infrastructure and demand side incentives are in place
- Objective and considerations of additional policy instruments and its applicability / suitability must be carefully considered