

The Sustainable Logistics Development in Greater Bay Area – Policy and Recommendation

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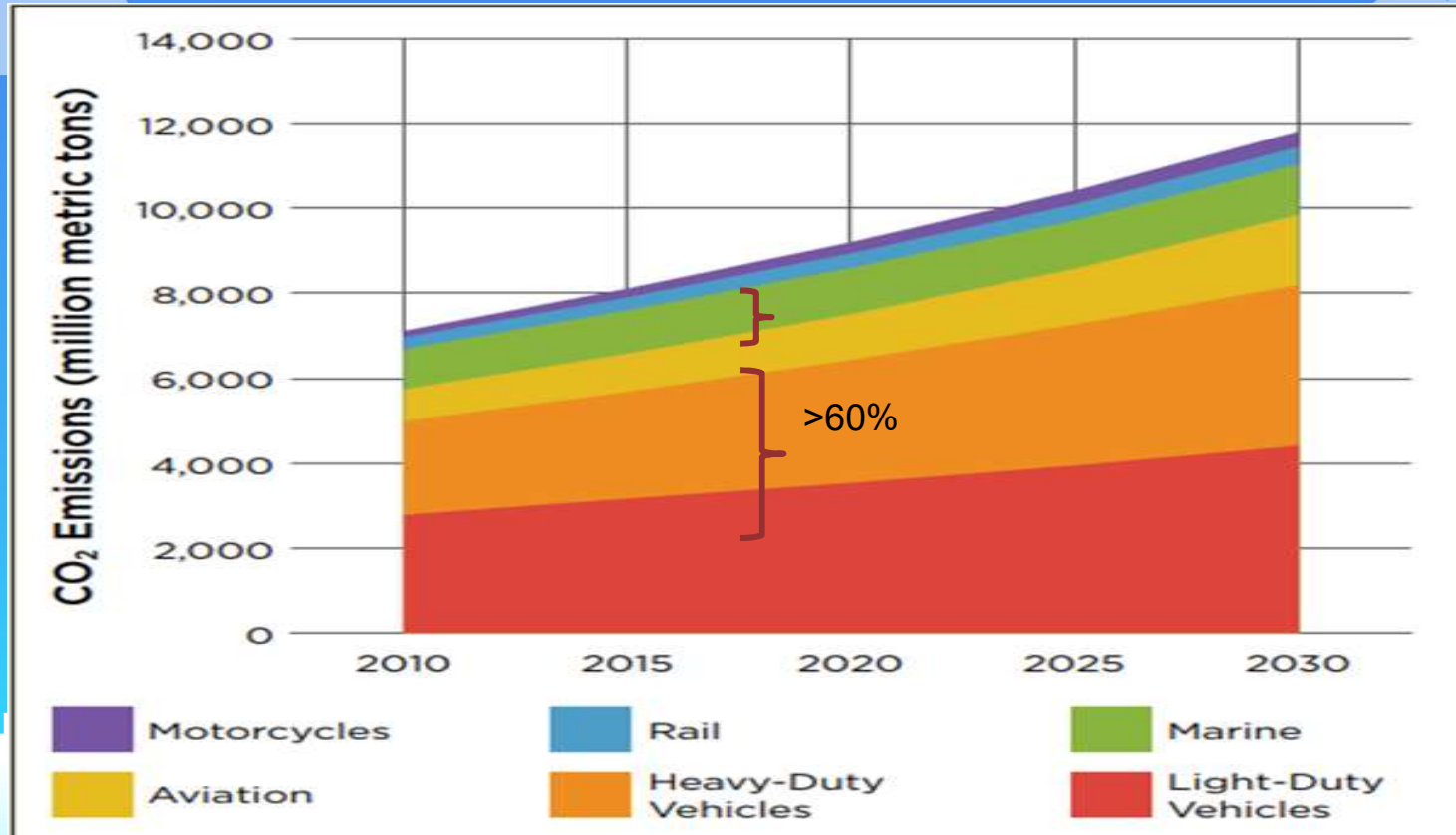
Paris Agreement

2

- Long-term temperature goal (2100)
 - Keep warming well below 2°C
 - Limit rise to 1.5°C
- Mitigation
 - Nationally determined contribution (NDC)
 - All Parties to prepare, communicate and maintain the NDC
 - Domestic measures to achieve the NDC
- Voluntary cooperation/Market- and non-market-based approaches
- Obligations of developed countries to support the developing countries
- Report on mitigation and adaptation
- Climate change education, training, public awareness, public participation and public access to information

Source: UNFCCC

Growth in Global CO₂ Emissions by Transportation Mode



Source: International Council on Clean Transportation.

Freight's Impact

4

- Total transportation energy use
 - Freight trucks - 23%
 - Marine vessels - 12%
 - Rail and pipelines - a combined 4%(IEA, 2015)
- By 2050
 - International freight transport volumes will grow more than **fourfold**
 - Average transport distance across all modes will increase **12%**
 - CO₂ emissions from freight transport will grow by **290%**
- Freight will replace passenger traffic as main source of CO₂ emissions (ITF-OECD, 2015)
- **Road freight** transport is expected to be a key source of
 - **global oil demand and CO₂ emissions growth** over the next few decades (IEA, 2016a)

Recent Policy in China

- China: Reduce carbon intensity (amount of CO₂ emitted per unit of GDP) by **40-45%** by 2020 based on its 2005 level
- National Development and Reform Commission (NDRC) under China's State Council selected 2 provinces and 5 cities (Beijing, Tianjin, Shanghai, Chongqing, Shenzhen, Hubei and Guangdong) to establish pilot emissions trading scheme (ETS) during the Twelfth Five-Year Plan in 2011 (National Development and Reform Commission, 2011)

Provinces / Cities	Established date
Beijing (city)	28 th December, 2013
Tianjin (city)	26 th December, 2013
Shanghai (city)	26 th November, 2013
Chongqing (city)	19 th June, 2014
Shenzhen (city)	18th June, 2013
Hubei (province)	2 nd April, 2014
Guangdong (province)	19th December, 2013

Measures of HK and the Guangdong Province

	Hong Kong	Guangdong Province
Measures from 2003	Encourage replacement of diesel light buses with clean-fuel ones	Develop fast inter-city transportation system and establish a high-speed transport system in the PRD region
	Retrofit particulate removal devices in pre-Euro diesel vehicles	Develop green transportation
	Tighten fuel quality standards	Control tailpipe emissions
	Tighten tailpipe emissions standards	
Measures from 2017	Tighten vehicle emission standards to Euro VI	Advance the implementation of National VI emission standards for motor vehicles in the PRD
	Continue to phase out pre-Euro IV diesel commercial vehicles	Strongly promoting the use of new energy vehicles
	Mandate heavy vessels to use low-sulphur fuel in HK waters (since 2015)	Establish a domestic emission control area (DECA) in PRD waters and progressively implementing the use of low-Sulphur fuel for vessels navigating, berthing and operating within the DECA in accordance with requirements. (since 2018)

Reduction Achievements and Targets of China



	12th Five-Year Plan's Achievements (Compared to 2010)	13th Five-Year Plan's Targets (Compared to 2015)
Energy Intensity (Energy Consumption per Unit of GDP)	-18%	-15%
Carbon Intensity (Carbon Emissions per Unit of GDP)	-21%	-22%
Non-Fossil Fuel Percentage	12%	15%
Sulfur Dioxide (SO ₂)	-18%	-15%
Nitrogen Oxides (NO _x)	-19%	-15%
Ammonia Nitrogen	-13%	-10%
Chemical Oxygen Demand (COD)	-13%	-10%



Source: National development and reform commission, State Information Center of China

Emission Reduction Results in 2015 (HK)

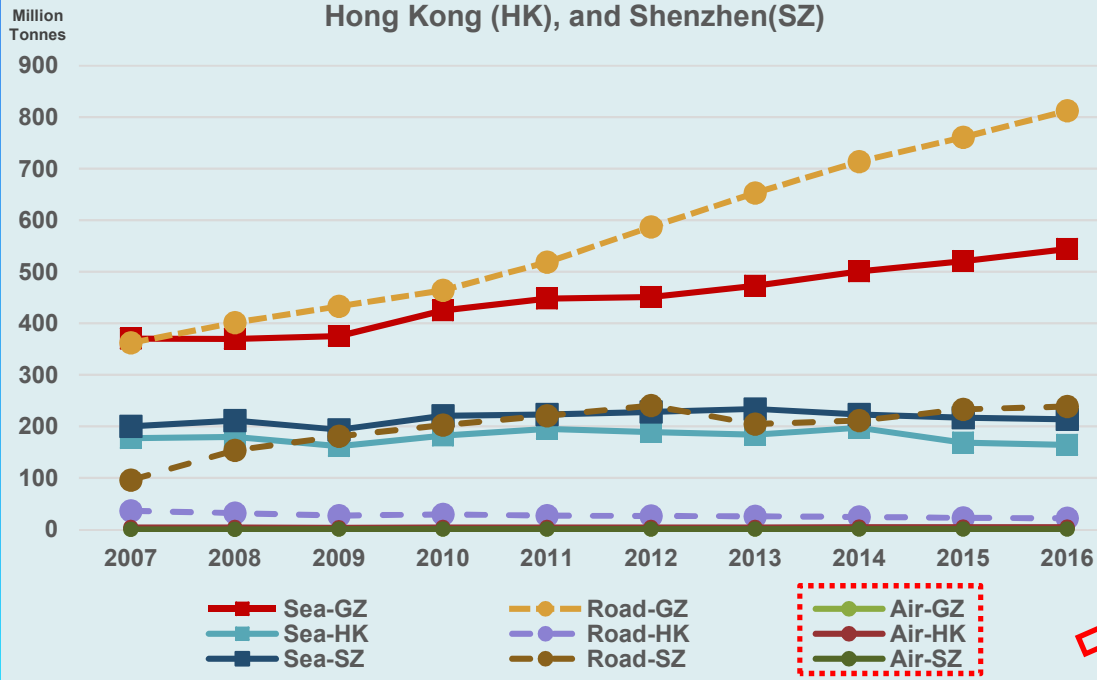
Pollutant	Region	Emissions (Tonnes)		Actual Emission Reduction in 2015#	Emission Reduction Targets in 2015
		2010	2015		
SO ₂	HK	35,480	19,540	-45%	-25%
	PRD	505,750	379,300	-25%	-16%
NO _x	HK	107,150	91,700	-14%	-10%
	PRD	942,830	735,420	-22%	-18%
RSP	HK	6,770	5,430	-20%	-10%
	PRD	622,390	535,260	-14%	-10%
VOC	HK	31,020	26,610	-14%	-5%
	PRD	980,950	873,060	-11%	-10%

Reductions are relative to 2010 emission levels.

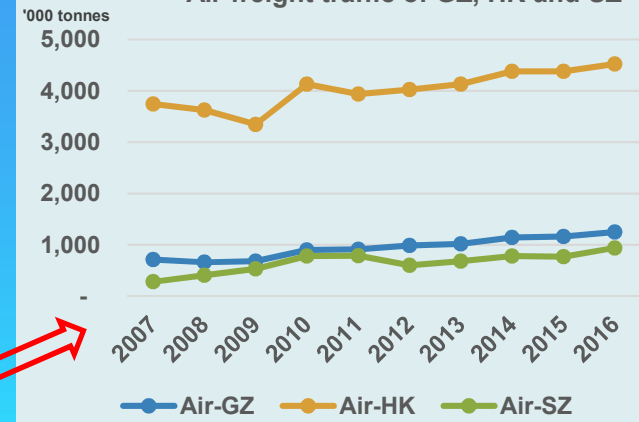
Source: Environmental Protection Department

Freight Traffic in the Greater Bay Area

Freight Traffic of Guangzhou(GZ), Hong Kong (HK), and Shenzhen(SZ)

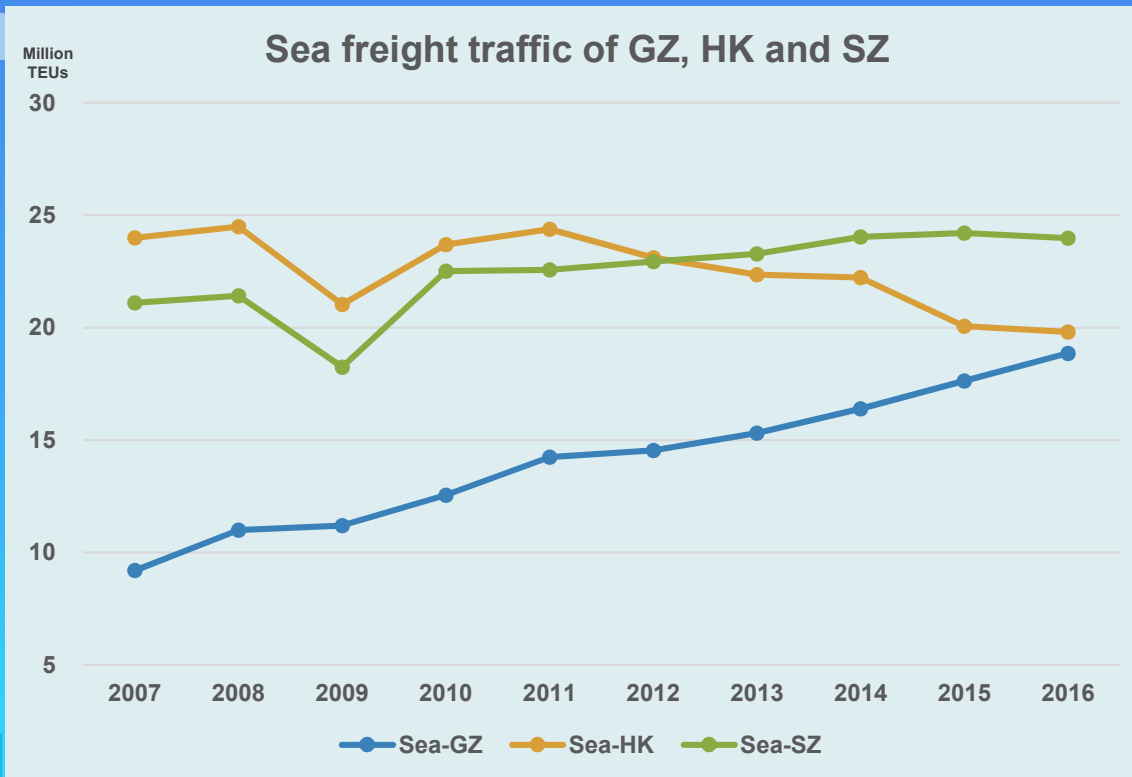


Air freight traffic of GZ, HK and SZ



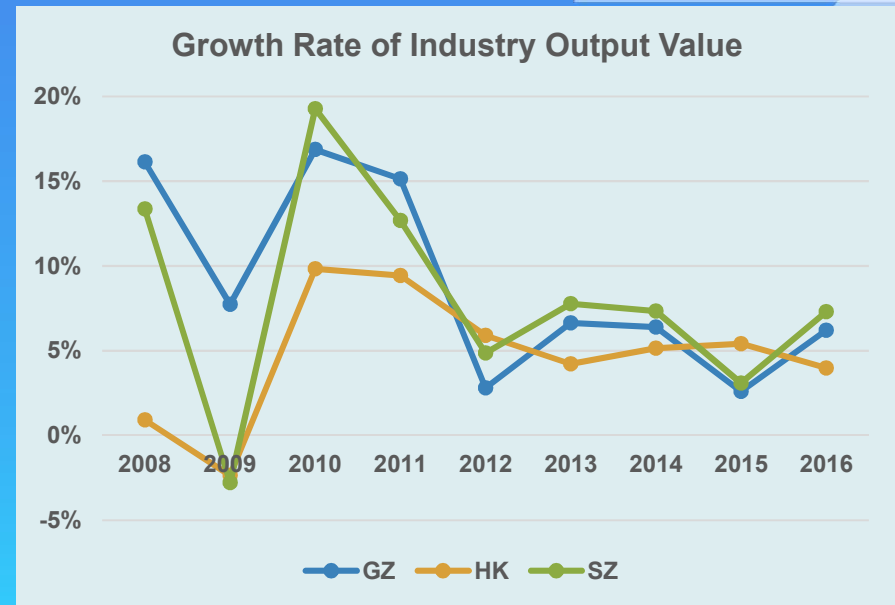
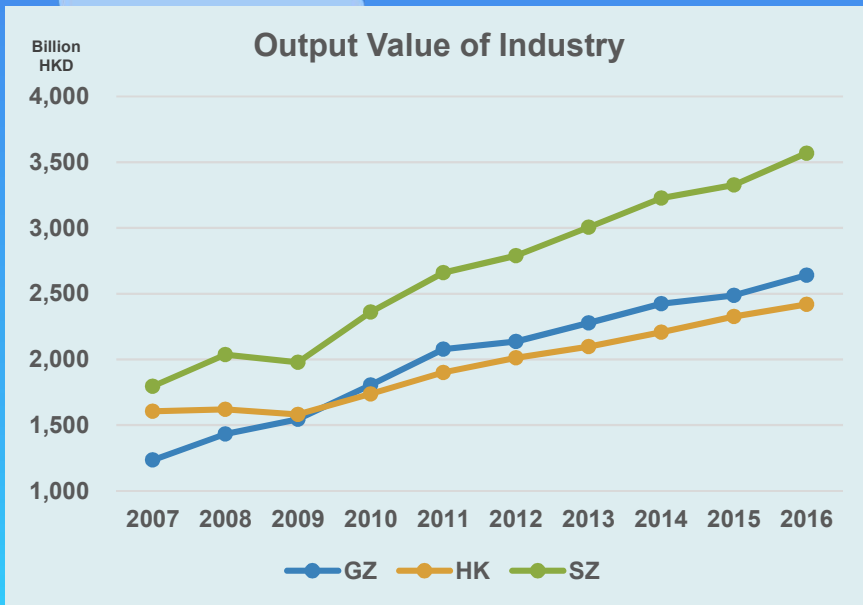
Source: Shenzhen Statistics Department, Guangzhou Statistics Department, and HK Transport and Housing Bureau

Sea Freight Traffic in the Greater Bay Area (TEUs)



Source: Shenzhen Statistics Department, Guangzhou Statistics Department, and HK Transport and Housing Bureau

Industry Output Value in the Greater Bay Area



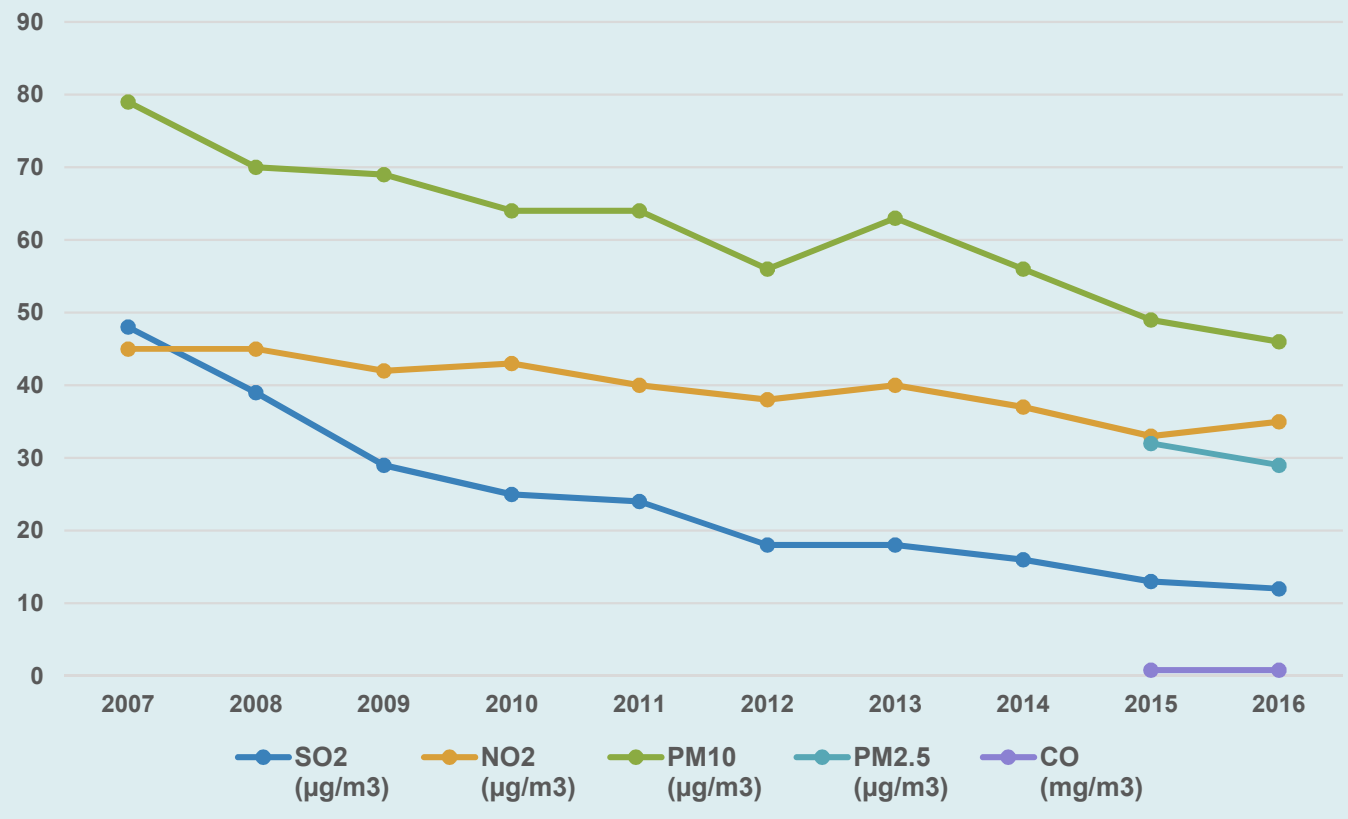
HK data is GDP data

Source: Shenzhen Statistics Department, Guangzhou Statistics Department, and HKCSD

Ports and Airports in the Greater Bay Area



Annual Pollutants in the Greater Bay Area



Source: Guangdong Provincial Environmental Monitoring Centre

Breakdown of Emission Inventory – 2015 (HK)

14

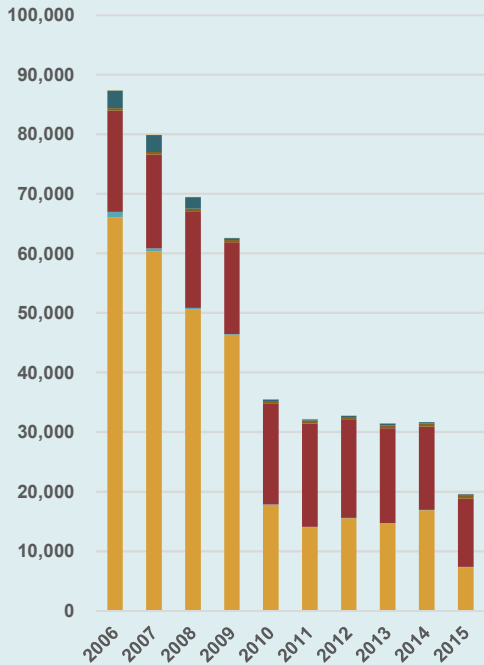
Pollution Sources	SO ₂	NO _x	RSP (pm 10)	FSP (pm 2.5)	VOC	CO	Total Emissions %
Public Electricity Generation	7,280	26,090	580	290	420	3,580	19%
Road Transport	40	16,200	490	450	4,800	29,700	25%
Maritime	11,460	33,900	1,860	1,690	4,160	13,280	32%
Civil Aviation	510	5,000	50	50	710	3,950	5%
Other Combustion	240	10,450	800	740	1,040	5,920	9%
Non-combustion	-	-	910	470	15,320	-	8%
Biomass Burning	10	60	740	600	160	1,720	2%
Total Emissions	19,540	91,700	5,430	4,300	26,610	58,150	-
Total Emissions %	9%	45%	3%	2%	13%	28%	100%

Source: Environmental Protection Department

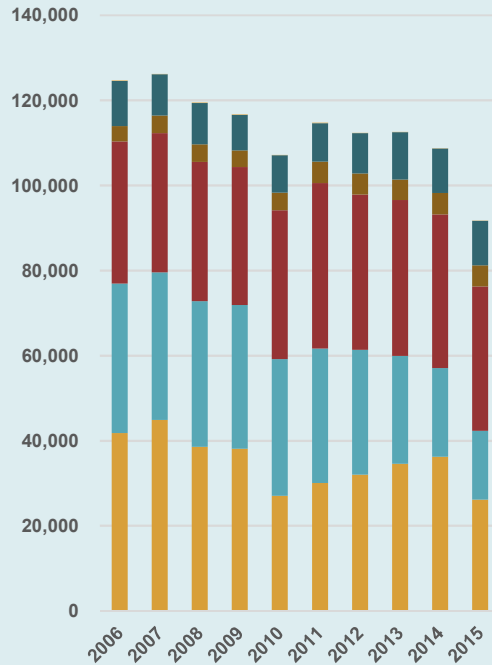
Trend of Pollutants from 2006 to 2015 (HK)

Unit: Tonnes

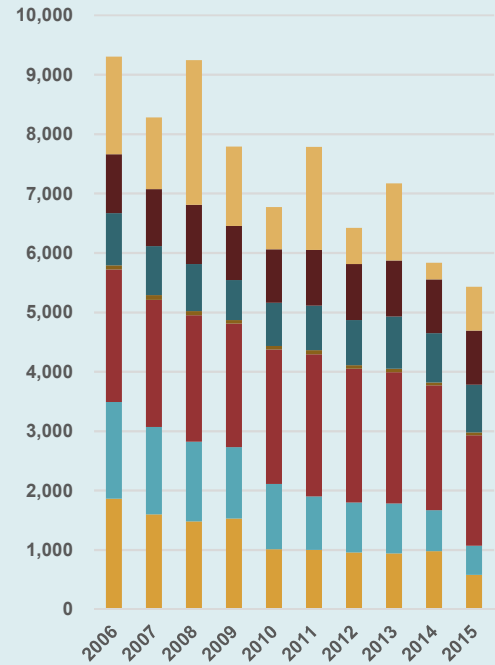
Trend of SO2 Emission



Trend of NOx Emission



Trend of RSP Emission



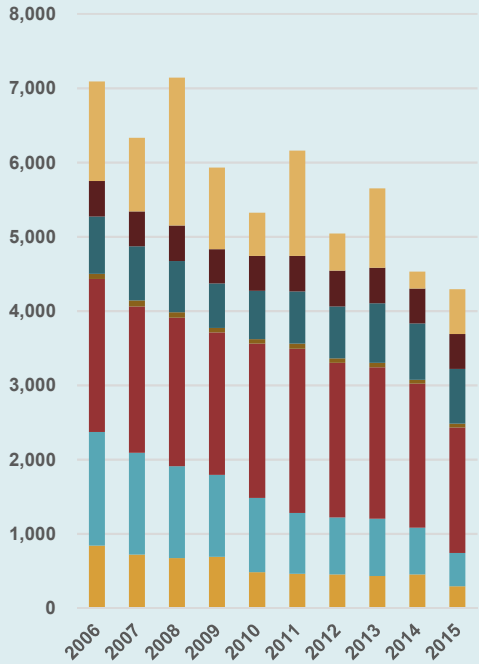
- Biomass Burning
- Non-combustion
- Other Combustion
- Civil Aviation
- Maritime
- Road Transport
- Public Electricity Generation

Source: Environmental Protection Department

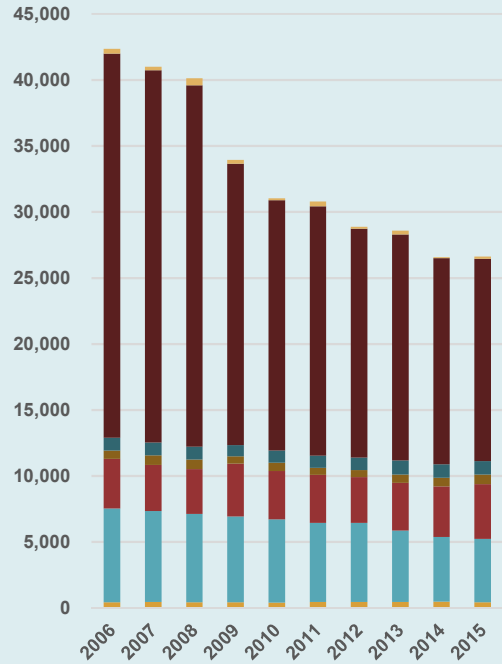
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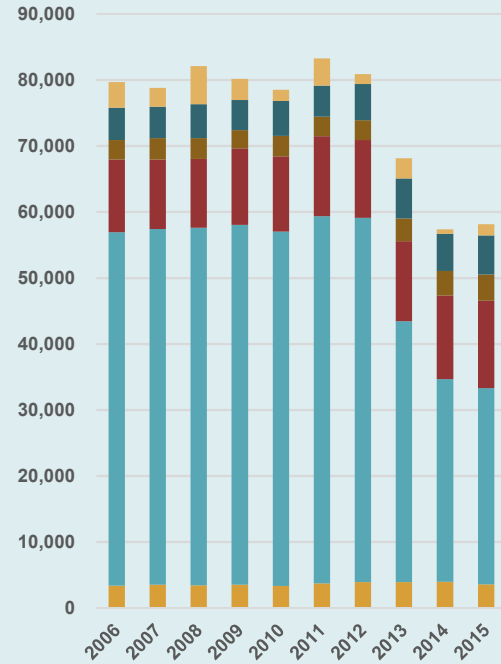
Trend of FSP Emission



Trend of VOC Emission



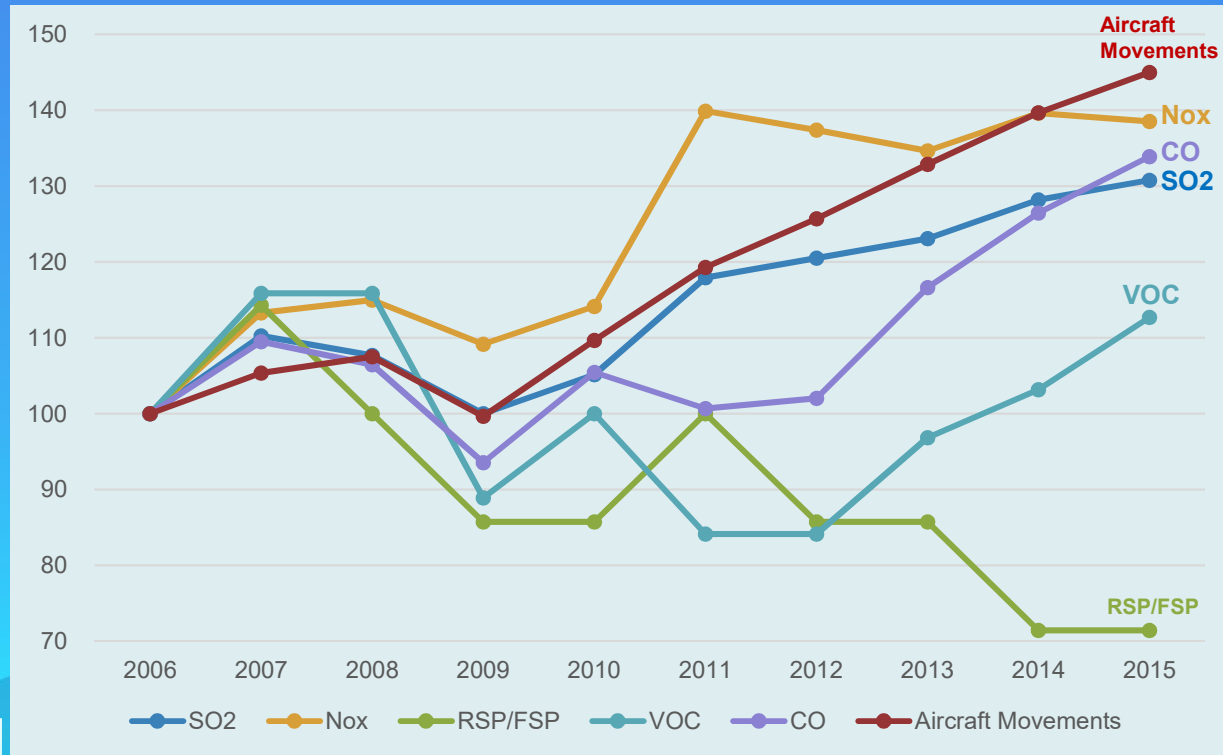
Trend of CO Emission



- Biomass Burning
- Non-combustion
- Other Combustion
- Civil Aviation
- Maritime
- Road Transport
- Public Electricity Generation

Source: Environmental Protection Department

Emissions Trend of Civil Aviation from 2006 to 2015 (HK)



Source: Environmental Protection Department, HKIA

Meeting Bureaus of the Central Government

Date	Bureaus Visited	Topics Discussed
September 18 th	HK and Macau Affairs Office of the State Council	Comprehensive development of airports in the South of China
		HongKong-Zhuhai-Macau Bridge and Shenzhen-Zhongshan Tunnel
		Transport arrangement of the HongKong-Zhuhai-Macau Bridge
		Facilitating cross-border transport
	General Administration of Customs	Facilitating air transport service
		Development of the regional Single Window
		Green channel of the HongKong-Zhuhai-Macau Bridge
	Ministry of Transport and Communications	Towards to the high-end shipping port center
		Air traffic flow enhancement in East China
		HongKong-Zhuhai-Macau Bridge and Shenzhen-Zhongshan Tunnel
Transport arrangement of the HongKong-Zhuhai-Macau Bridge		
September 19 th	National Development and Reform Commission	Facilitating cross-border transport
		Development plans of city group in the Greater Bay Area
		Comprehensive development of airports in the South of China



Standardization of Policies & Measures

An Ideal place for living, working and travelling

- Two – Phase Approach
- Phase One – Integrating 9 mainland cities first
- Phase Two – 9 Cities + 2 SARs

Two-Phase Approach

- Phase One – Integrating 9 mainland cities first
- Uniformity in regulations and policies
 - Customs processes and policies
 - Subsidies from municipal governments
- Corporate Governance

Two-Phase Approach

21

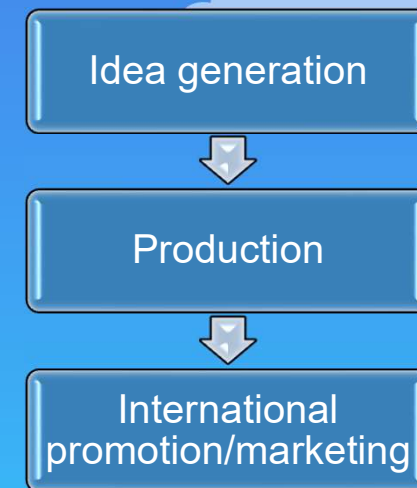
- Phase Two – 9 Cities + 2 SARs
- Alignment of Systems and Policies
 - Information sharing and standardization
 - Alignment to international standards
 - Government incentives

Policy Recommendations - Division of Services

- Four Approaches
 - Geographical
 - Natural or sustainable advantages
 - Synergistic positioning
 - Strategic integration

Division of Services

- Recommendations
 - Guangdong: Manufacturing
 - Shenzhen: Innovation and technology
 - HK: Innovation, management, funding, finance, international connection, training & management
- Lok Ma Chau Loop Innovation and Technology Park
 - Talents from both HK & PRD
 - Green technology innovation



World top 50 universities	Rank
The University of Hong Kong	26
The Hong Kong University of Science and Technology	30
The Chinese University of Hong Kong	46
City University of Hong Kong	49

Policy Recommendations - Single Window

- Policy Recommendations
 - Construct single windows for customs and clearance across the Greater Bay Area (GBA)
 - Link Single Window to digital trade and transport platforms
 - e-Customs
 - Facilitate Consolidation

Policy Recommendations

- Regulatory Authorities
 - Devise a Greater Bay Area regional strategy to reduce freight's environmental impacts
 - Cross-sectoral cooperation
 - Regulatory authorities level up
 - HK & Macau
 - PRD

Policy Recommendations

26

- Greater Bay Area Decarbonization
 - Establish regional and national green freight programs and initiatives
 - Program and policies
 - Financing mechanisms
 - Green bonds
 - Tax incentives
 - Emissions Trading Scheme (ETS)
 - Data and Methodologies

Policy Recommendations

- Establish Low-Emission Zones (LEZ) and standards
 - Standardize vehicle emission standards regionally
 - LEZs can reduce particulate matter and nitrogen oxides by 25% and 10 %, respectively (World Resources Institute study, 2017).
- Measure and monitor the emissions on how supplies and products are delivered, and the environmental health of GBA.
 - Adopt carbon footprint product label
 - Establish GBA Green Indexes



Source: edgeenvironment.com

Policy Recommendations

- Support private sector in improving fuel efficiency and reducing emissions across the GBA supply chain, and in turn cost savings
 - Provide the industry with tools to mitigate the risks of rising energy costs.
 - Promote the continual reduction of environmental impacts of freight transportation
 - Through mutually-aligned or recognized regulations
 - Voluntary programs
 - Mandate cleaner fuel for all ships in GBA waters

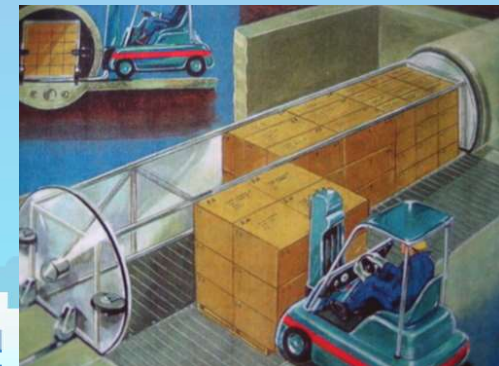
Recommendations – Business Opportunities

- Subsidize innovations and technologies that strengthen the efficiency of goods movement.
- Multimodal freight transport and transshipment methods
 - Enhance the connectivity of rail, waterway/port, road and air systems.
 - Save around 40% of emissions.
- Internet + logistics
 - Facilitate information flow to enhance logistics efficiency.
 - Reduce 30 to 50 % of empty miles (distance traveled by trucks without payload) in China.
- Big Data Analytics
 - UPS - savings of >8.4 million gallons of fuel by cutting 85 million miles in 2011

source: www.mnn.com

Recommendations – Business Opportunities

- Monitoring and Trading Platforms
- Logistics Industry Alliance
 - Reduce door-to-port distance
 - Reduce port-to-port distance
 - Utilization ↑
 - Idle time ↓
- Automation in ports, air cargo terminals, warehouses
- Smart city
 - Truck consolidation
 - Smart route planning
 - Sharing economy
 - Underground freight network



Source: engen.org.au

Recommendations – Business Opportunities

- Policy incentives for clean technologies and fuels
 - Urban deliveries with frequent stop-and-go conditions.
 - Trucks can reduce up to 85% of fuel emissions by using a combination of the verified clean technologies (U.S. Environmental Protection Agency SmartWay Program).
 - Infrastructure planning, e.g. charging stations across GBA
 - Several European countries and India plan to ban diesel and gasoline vehicles (by 2030 or 2040 onwards)



Source: cnbc.com



供應鏈及資訊管理學系

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Thank you!

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