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This project is co-funded
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Clean Air in Port Conference

Controlling Emissions from Marine Vessels in Hong Kong

Peter Louie

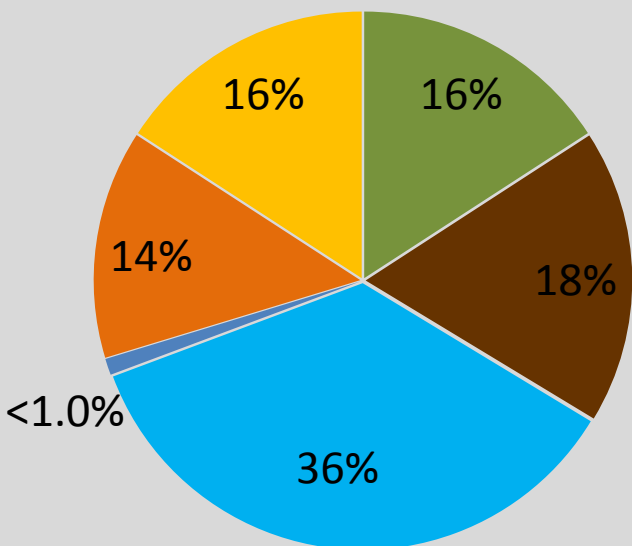
Environmental Protection Department
Hong Kong SAR Government

12 October 2015

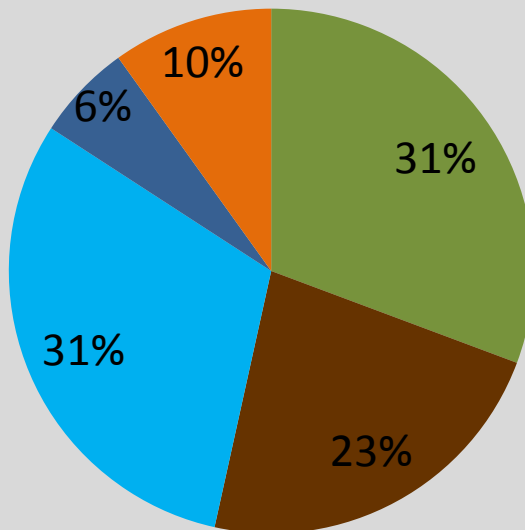


Sources of Hong Kong's Local Emissions in 2013

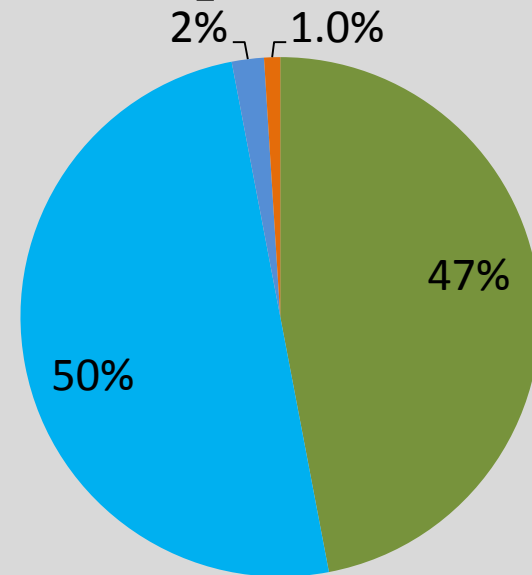
PM₁₀ Emission



NO_x Emission

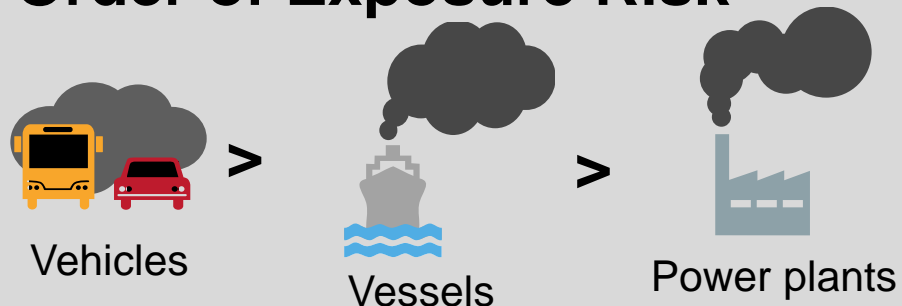


SO₂ Emission



- Navigation
- Road transport
- Public electricity generation
- Non-combustion
- Other fuel combustion
- Civil Aviation

Order of Exposure Risk

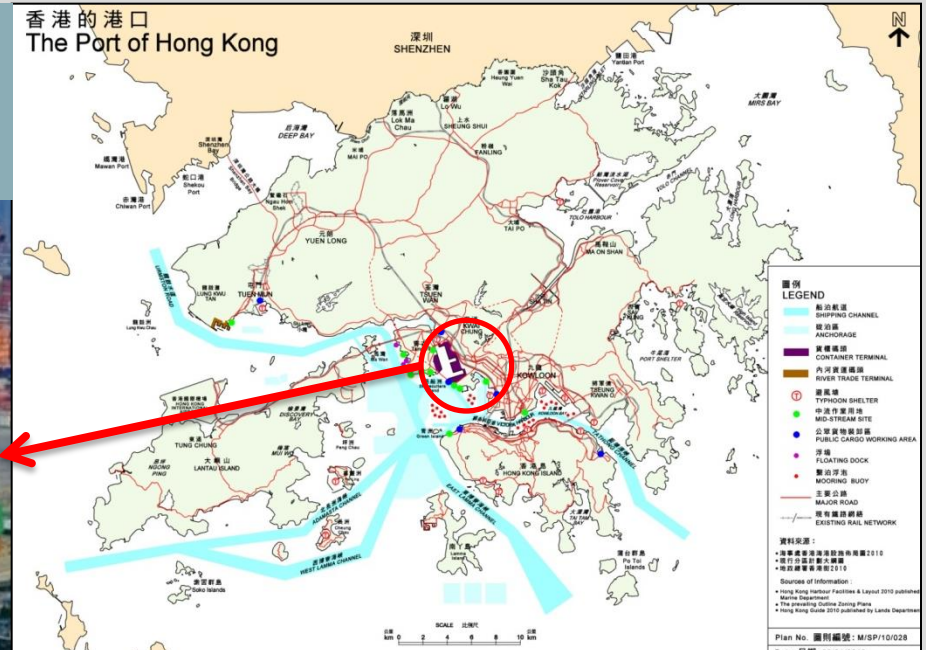


Regional challenge – Hong Kong smoggy days



Hong Kong Port

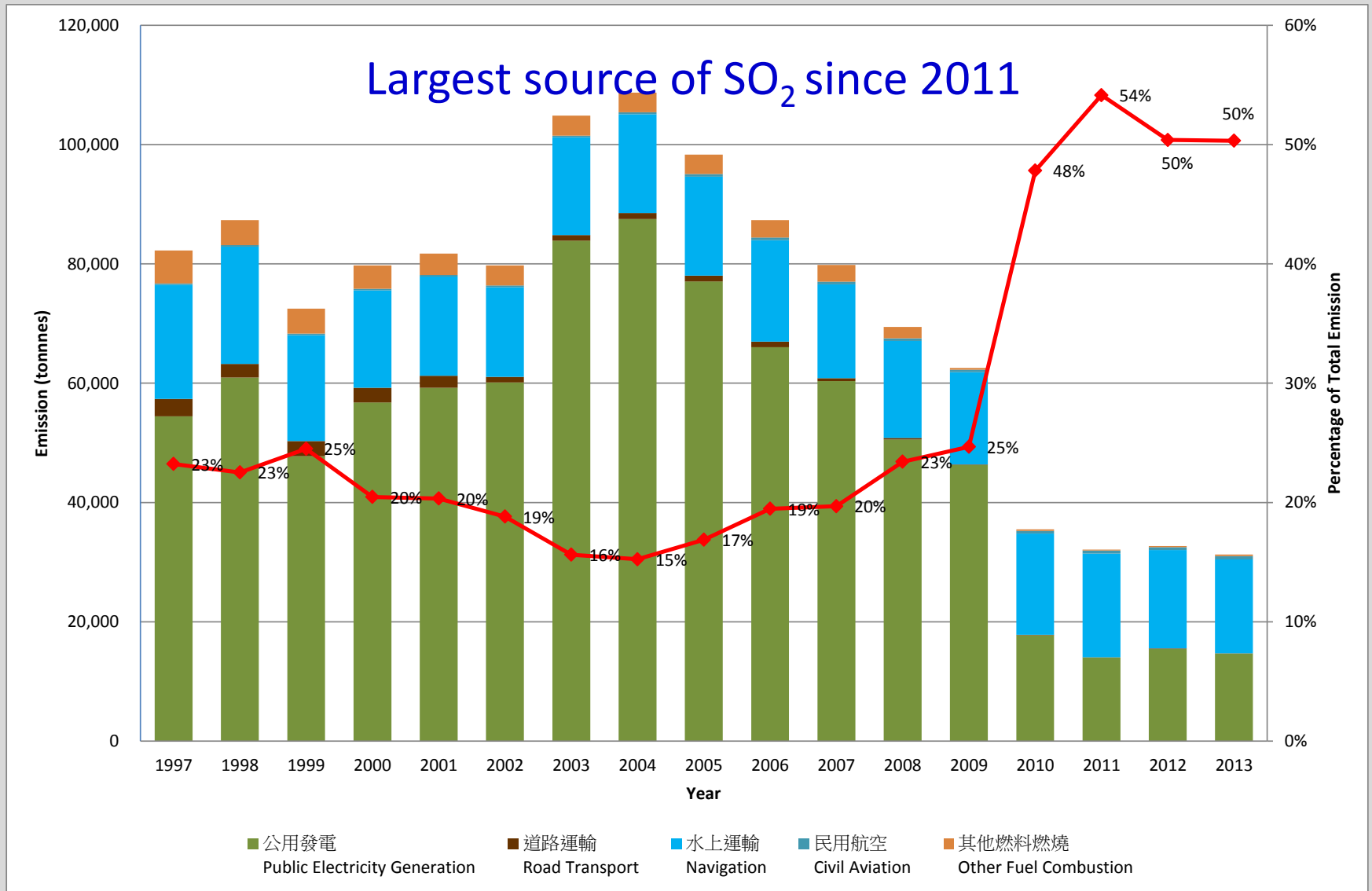
4th largest container port in 2013 (in TEU)



Geographical constraints

- 1) Small stretch of waters
- 2) Terminals close to population
- 3) Major water fairway to Mainland ports nearby

Why we need to control marine emissions?



Marine Emissions

Air Pollution

- emissions
- nuisance
- public health

Since 2011, marine vessels became the top emitter.



NO_x
31%



SO₂
50%

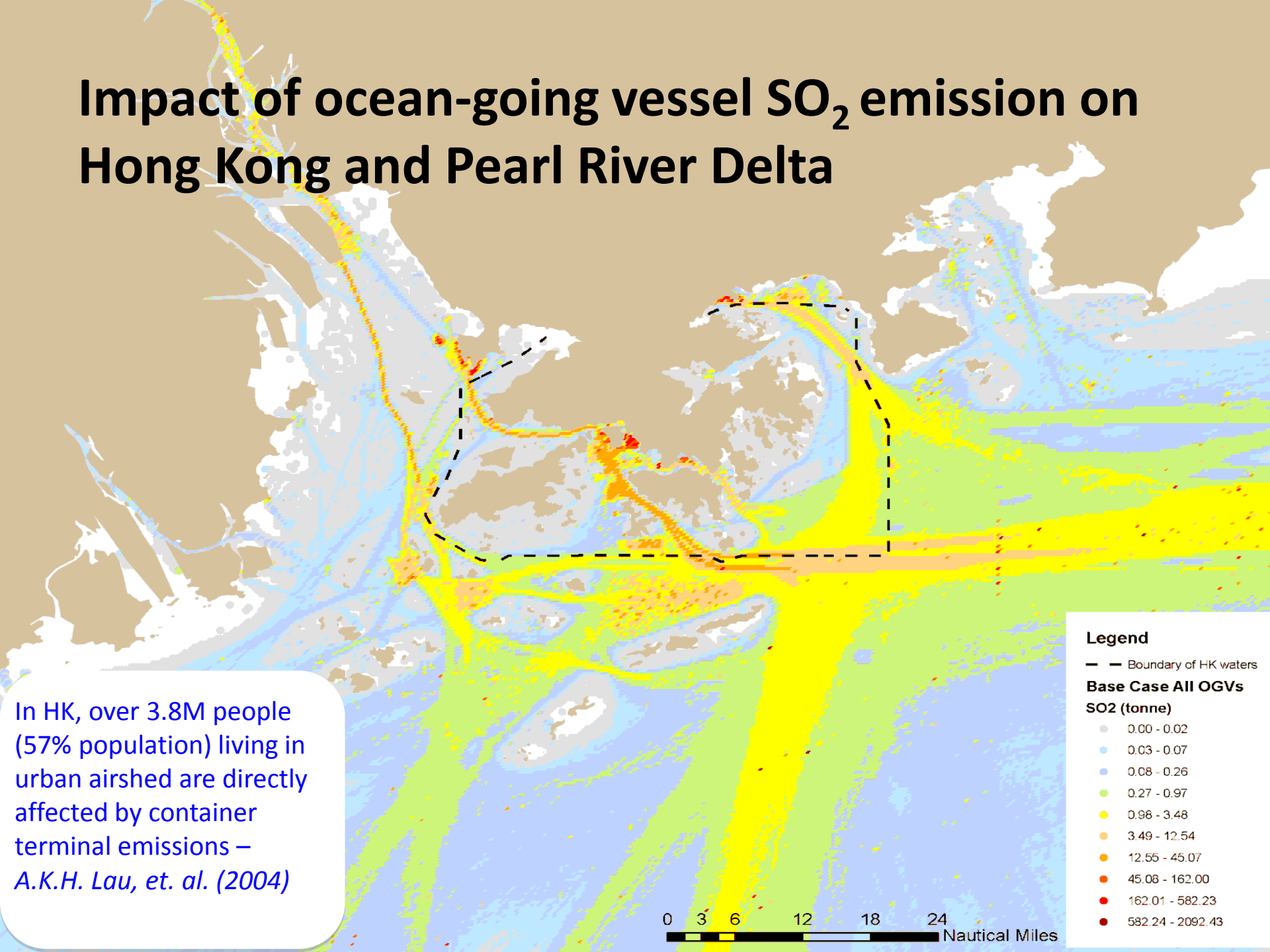


RSP
36%



Vessels: Ocean-going vessels,
River Vessels and Local Vessels

Impact of ocean-going vessel SO₂ emission on Hong Kong and Pearl River Delta

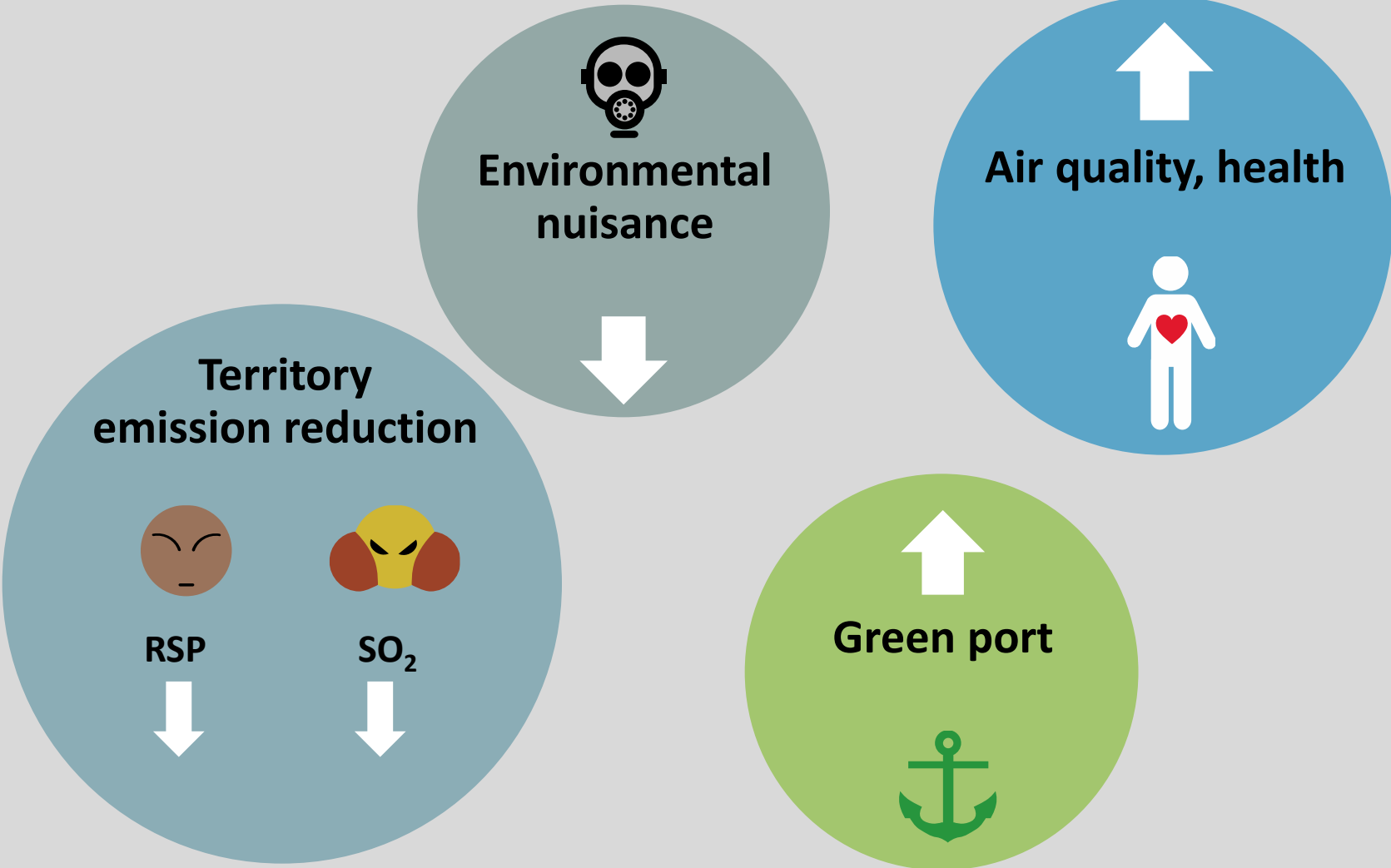


In HK, over 3.8M people (57% population) living in urban airshed are directly affected by container terminal emissions –
A.K.H. Lau, et. al. (2004)

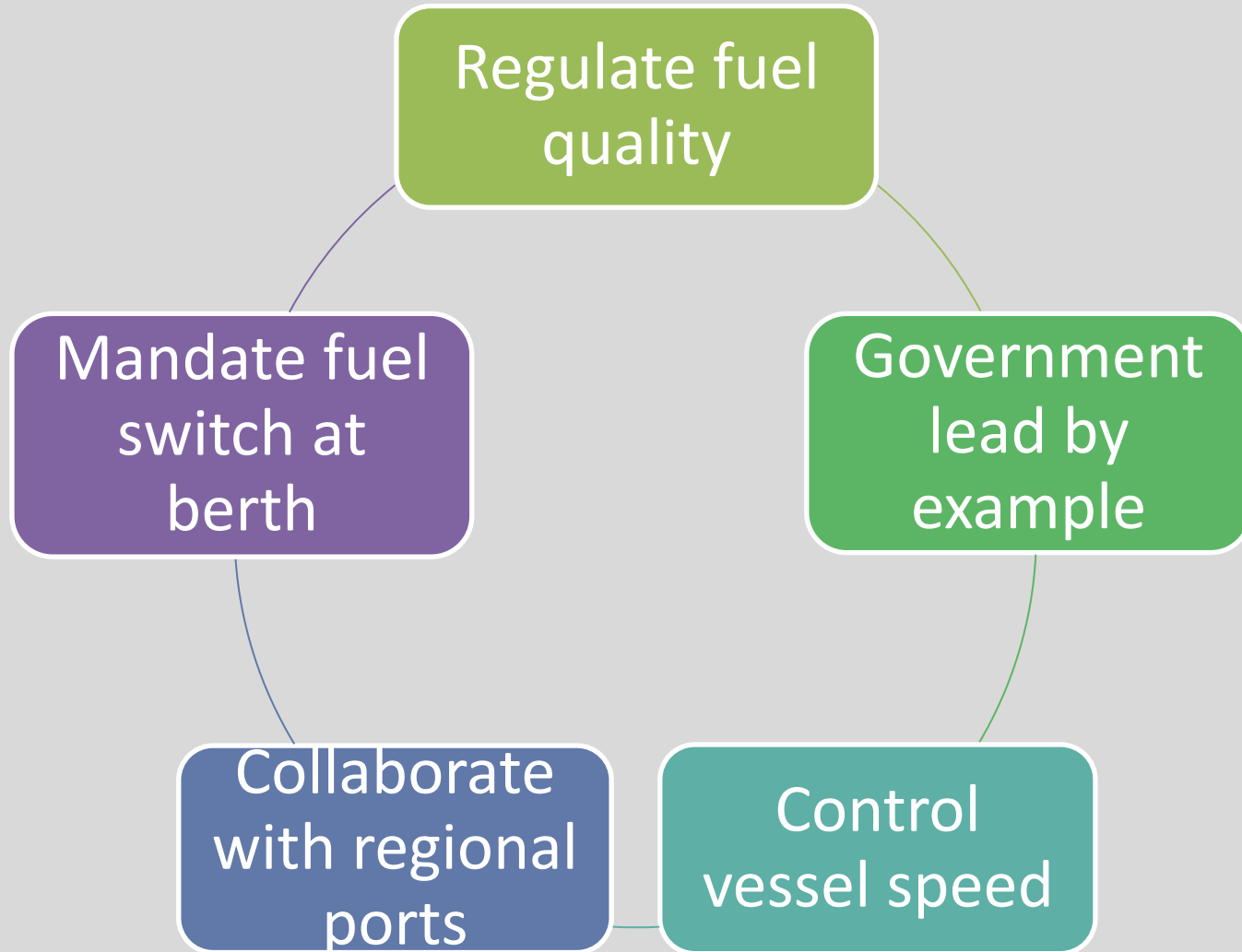
Government, shipping industry and stakeholders make great effort to control marine emission



Benefits of Controlling Marine Emission



Multi-pronged Control Strategy



Regulate Local Marine Fuel Quality

- Introduced **Air Pollution Control (Marine Light Diesel) Regulation** on 1 April 2014
- Imposed 0.05% sulphur limit on locally supplied marine light diesel
- For local and river vessels refilled in HK:

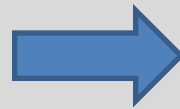
SO₂ emission  **90%**

RSP emission  **30%**

Fair Winds Charter – ocean going vessels

Trade initiated voluntary fuel switching

2010:
Liners started
switching fuel
voluntarily



Industry-led
joint effort
NGO
facilitated



Introduced since
2011, extended till
end 2014

Target: Fuel
switch
throughout
Pearl River
Delta

The Fair Winds Charter
2011 - 2012

As international carriers, we recognise the emissions from our ships affect air quality in Hong Kong and the Pearl River Delta region. As responsible business, we VOLUNTARILY COMMIT TO:

- Switching to a fuel containing 0.50% sulphur content or less (Low Sulphur Fuel) while at berth (at the terminal or at anchorage) to the maximum extent possible.
- Underwriting this voluntary initiative between 1 January 2011 and 31 December 2012.
- Collaborating with our sector and with the Hong Kong SAR and participating governments to introduce legislation on ship emissions, consistent with international standards.

In support of the HKLSA Fair Winds Charter, we:

- Engage the Hong Kong SAR Government to issue a bid and put work with the Guangdong Government to regulate the use of low sulphur fuel in the Pearl River Delta region by 31 December 2011.
- Engage the Hong Kong SAR Government to encourage broader industry participation by providing incentives, as it has done with other transport modes.
- Encourage the carriers themselves to support the initiative by offering advantages to participating ships, as well as by addressing emissions from cargo handling equipment, and the berths and local air off the water terminals.
- Encourage ocean going passenger liners and other maritime users of the Port of Hong Kong to use low sulphur fuel while at berth in Hong Kong.
- Encourage cargo producers and shippers to those participating shipping lines use of meeting their sustainable supply chain objectives.
- Make use of support of end consumers who purchase the goods that the shipping industry carries.

Supporting Signatories:

The Fair Winds Charter 2013

As members of international shipping vessels, we recognise that emissions from our ships affect air quality in Hong Kong and the Pearl River Delta region. We believe that our industry has a responsibility to support the government's priority to improve air quality in Hong Kong and the Pearl River Delta region. We have issued a public notice to address this issue. We introduced the Fair Winds Charter (FWC) to the world's major shipping industry at berth fuel switching initiative. The Hong Kong Government responded by introducing an incentive scheme to support the industry's efforts.

WE REINFORCE OUR COMMITMENT TO:

- Switching to a fuel with 0.50% sulphur content or less (Low Sulphur Fuel) while at berth in Hong Kong to the maximum extent possible.
- Underwriting this voluntary initiative until 31 December 2013.
- Collaborating with our sector and with the Hong Kong SAR Government and Guangdong governments to introduce legislation on ship emissions, consistent with international standards.

WE CALL ON THE HONG KONG GOVERNMENT TO WORK WITH THE INDUSTRY TO FURTHER ENHANCE EMISSION CONTROL CAPABILITIES:

- By providing incentives for at-berth fuel switching or equivalent measures for all ocean-going vessels in Hong Kong by January 2014, so that there is no net cost to the industry.
- By providing the provision of a portion of the port dues incentive scheme which other members of the shipping industry are enjoying in Hong Kong.
- By encouraging the major cargo producers and shippers to support the initiative to ship through air-sea transport corridors.
- By collaborating with regional governments to regulate port air quality.
- By ensuring a consistent and effective marine fuel regulation, safety and compliance measures.

We believe that every shipping vessel at a major berth in Hong Kong operates at low sulphur content combined with other measures to reduce emissions from ships. We encourage all shipping companies to continue to work together to reduce emissions from ships. We encourage all shipping companies to continue to work together to reduce emissions from ships.

If there is to achieve progress towards regulatory compliance by 31 December 2013, participating members may issue their voluntary fuel switching notices to the fleet.

The recent work on discussing with government and other stakeholders on reducing air quality during our stay at berth is our commitment to further enhance our emission control measures, being particularly in the implementation of all Emission Control Areas (ECA) for the entire IMO region. The use of all alternative emission systems, major energy consumers in support of FWC 2013 is particularly an encourage other operators of participating vessels in Hong Kong to join in FWC 2013. Furthermore, we encourage all operators to sign government and industry to participate in the FWC 2013.

Supporting Signatories:

HKLSA & HKSOA Extend Fair Winds Charter, Reducing Marine Emission

Hong Kong, 12 February 2014 – The Hong Kong Liner Shipping Association (HKLSA) and the Hong Kong Shipowners Association (HKSOA) have agreed to continue their support for reduced emissions in the maritime sector by extending the Fair Winds Charter 2013 for another year.

The FWC2013, which was due to expire end of December 2013, lays out the industry's commitment to switching to low sulphur content fuel while in Hong Kong port. It is a strategic, intentional, and voluntary effort started at the end of 2010 involving many of Hong Kong's leading carriers and cruise liners. Arthur Bowring, Secretary General of the HKSOA, says, "The pioneering work to switch to low sulphur fuel in Hong Kong under the 'Fair Winds Charter' shows the shipping industry's commitment to work with government to tackle the challenges of marine emissions. We are pleased to once again see the Chief Executive's support in the Policy Address for action to address this issue, and believe that by working together, government and the shipping industry can achieve significant improvements in air quality in HK."

The Fair Winds Charter is jointly sponsored by the HKLSA and the HKSOA, and couples the industry's commitment to fuel switch together with active support towards a number of targets – including gazetted legislation for fuel switching in HK by 2015, support and participation by other industry stakeholders, and strategic engagement with cross-border economies that would see overall reduction of marine emissions in the greater Pearl River Delta region.

Roberto Giannetta, Secretary General for the HKLSA, says, "Since the FWC was signed, we have seen strong support from the HK government in terms of financial assistance through port due subsidies and engagement with industry in the drafting of potential legislation mandating fuel switch in Hong Kong. While there has been some progress in addressing air emission targets in Shenzhen and Guangzhou, PRD regional targets have not progress very far yet. We hope that by extending the FWC for another year, thus showing our commitment and support, that we are ready to cooperate, in whatever way possible, with PRD regional governments in establishing realistic, achievable emissions reduction targets in the near future. These targets could, then eventually, lead to a wider Emissions Control Area covering the greater air-sea we breathe."

This renewed commitment by the shipping industry will extend the FWC2013 until Dec 2014, after which time fuel switching is expected to become mandatory through legislation in Hong Kong. This will also give HK and PRD governments a further 12-month window to come together on some meaningful, concrete and practical measures that will see HK's air quality continue to improve in the coming years.

Government Incentive Scheme – Ocean going vessels

Sept 2012
3-year
scheme

50%
reduction in
port dues

Extended till
31 March
2018

The screenshot shows the website of the Environmental Protection Department of the Government of the Hong Kong Special Administrative Region. The page is titled 'Port Facilities and Light Dues Incentive Scheme for Ocean Going Vessels (Extended Incentive Scheme)'. The main content area includes a 'Background' section which states: 'Ocean going vessels (OGVs) generally run on heavy fuel oil with sulphur content up to 3.5%. Sulphur dioxide (SO₂) emissions from OGVs at berth account for about 40% of their total SO₂ emissions within Hong Kong waters. To encourage OGVs to switch to low sulphur marine fuel (i.e. fuel with sulphur content not exceeding 0.5%) while at berth, the Government launched a 3-year Port Facilities and Light Dues Incentive Scheme on 28 September 2012. Under the Incentive Scheme, OGVs switching to low sulphur marine fuel while at berth can enjoy 50% reduction in light facilities and port dues.'

By end August 2015

Participation: 10,700 OGV-calls

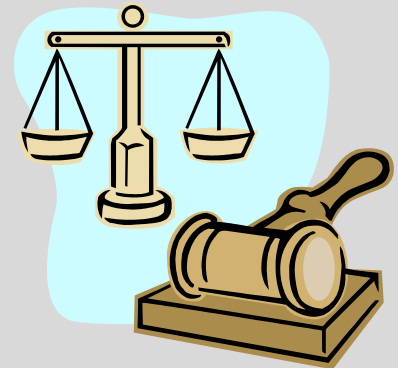
Revenue forgone: HK54.8M

Mandatory Fuel Switching – Ocean going vessels

- Air Pollution Control (Ocean Going Vessels)(Fuel at Berth) Regulation became effective on [1 July 2015](#)
- Ocean going vessels (OGVs) to use low sulphur fuel ($S \leq 0.5\%$), LNG, alternative fuel or equivalent emission abatement technology while prohibition period (excluding the first hour and last hour of berthing)
- Pioneer in Asia
- Reduce 60% of SO₂ and RSP emission from OGVs during berthing

Mandatory Fuel Switching – Ocean going vessels

- We will board vessels for document check and fuel sampling to check for compliance
- Explore remote sensing technology to monitor stack gas emission



Government Fleet Using Euro V Diesel

Government fleet used Euro V diesel
(10ppm sulphur) since 2008

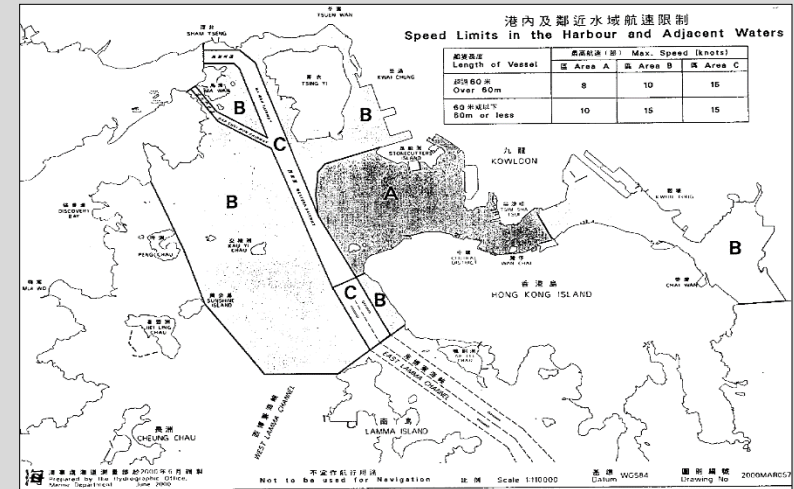
SO₂ emission ↓ 99%

RSP emission ↓ 30%



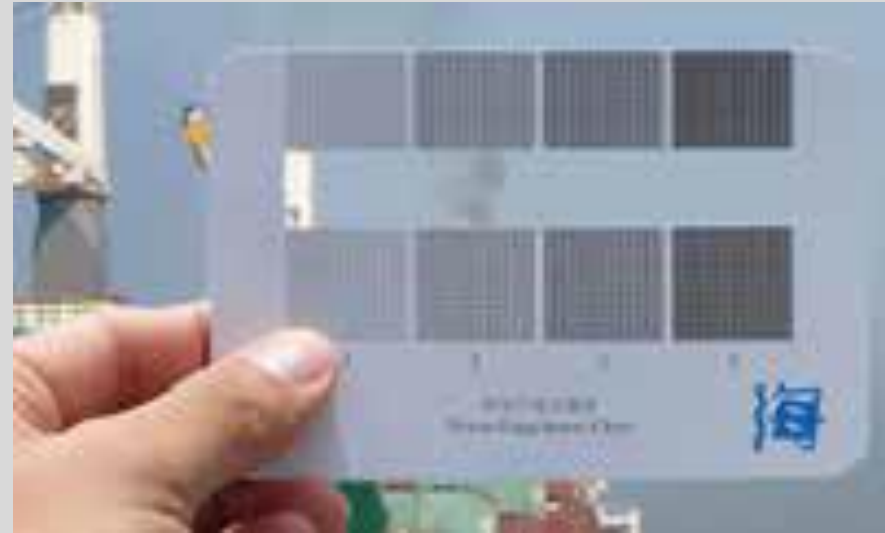
Vessel Speed Reduction

- Speed control (8-15 knots) in force in Victoria Harbour, Harbour East and West
- When ships slow down
 - energy consumption
 - emissions



	Vessel Length	
	$\leq 60m$	$> 60m$
(A)	10 kn	8kn
(B)	15 kn	10 kn
(C)	15kn	

Dark Smoke Control



- Enforced by Marine Department
- Amended legislation in July 2014 to introduce the use of Ringelmann Chart
- Dark smoke emission
 - exceed Ringelmann Chart shade 2 level for 3 mins
 - => offence

Pilot Green Transport Fund

- HK\$300 million Pilot Green Transport Fund launched in March 2011
- Support testing of green and innovative technologies used in public transport and goods vehicles
- Approved two trials on fuel saving and emission reduction devices on a ferry in Oct 2014
 - ✴ Retrofit its propulsion system with diesel-electric technology
 - ✴ Install seawater scrubber



Regional collaboration in PRD

- Ensure level-playing field and maximize environmental benefit
- Pursuing regional collaboration with Guangdong and Shenzhen on
 - fuel switch at berth
 - Setting up Emission Control Area (ECAs)



Latest Development

Shenzhen moved forward

Launched green shipping plan

**Incentive scheme
for OGVs
switching fuel at
berth**

**Incentive
scheme also for
OGVs using
onshore power**



Ministry of Transport

- Published Vessels and Port Pollution Prevention Special Implementation plan (2015-2020) on 31 August 2015
- Emission target: Reduce 65% SO_x, 20% NO_x and 30% RSP in 2020 as compared with 2015.
- Set up Emission Control Areas in **Pearl River Delta (PRD)**, Yangtze River Delta, the Bohai Rim (Beijing, Tianjin, Hebei) water

Thank you