

Hong Kong's Road Map to Clean Air



環境保護署

Environmental Protection Department

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Hong Kong

Land Area: ~1,100 km²

Urbanised ~25%



Remaining ~75%
(including 40% of the overall land as country parks)

High Density City



Permits efficient use of energy
and transport – 90% daily
journeys by public transport



7.4 million people over
less than 300 km² of
urbanised land



770,000 vehicles on
some 2,100 km of roads



Major Air Pollution Challenges

Roadside air pollution
[PM₁₀, NO₂]

Regional Smog
[PM_{2.5}, ozone]



Roadside air pollution

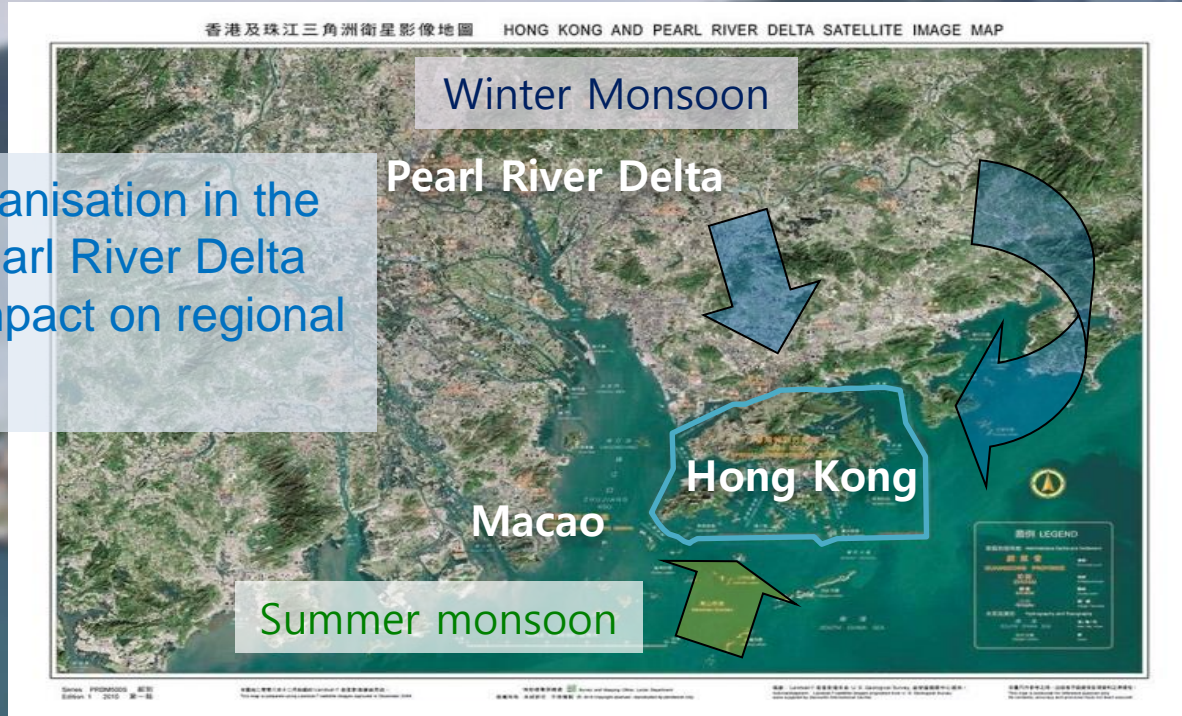
Concentrations of nitrogen dioxide (NO₂) at roadside double the Air Quality Objective (AQO) limit (40 mg/m³)

- High vehicle intensity especially commercial vehicles
- Restricted dispersion at street canyon

Commercial vehicles represent 20% of vehicle fleet but about 95% of NO_x and PM emission from the fleet

Regional Smog

Industrialisation & Urbanisation in the Hong Kong-Macao-Pearl River Delta (PRD) have a great impact on regional air quality



Clean Air Plan for Hong Kong

- Clean Air Plan, released in 2013, outlined comprehensively and clearly the air quality challenges as well as relevant policies, measures and plans to tackle the issues
- A progress report issued in June 2017 gave a detailed account on its implementation and achievements



Hong Kong's Air Quality Objectives (AQOs)

- World Health Organization (WHO) Air Quality Guidelines (AQGs) as a constant reference in setting HK's AQOs and making air quality policies

AQOs tightened in January 2014

AQOs mandated to be reviewed every 5-year

Aim to achieve AQOs by 2020

Pollutant		WHO Interim Targets ($\mu\text{g}/\text{m}^3$)			WHO AQGs ($\mu\text{g}/\text{m}^3$)
		IT-1	IT-2	IT-3	
SO ₂	10min	--			500
	24hr	125	50		20
RSP	24hr	150	100	75	50
	Annual	70	50	30	20
FSP	24hr	75	50	37.5	25
	Annual	35	25	15	10
NO ₂	1hr	--			200
	Annual	--			40
O ₃	8hr	160			100
CO	1hr	--			30,000
	8hr	--			10,000
Pb	Annual	--			0.5

Hong Kong's current AQOs indicated in Green

Regional Emission Reduction Targets in the Pearl River Delta

Pollutants	Area	2010 Emission Reduction Targets (cf 1997)	2015 Emission Reduction Targets (cf 2010)	2020 Emission Reduction Targets (cf 2010)
SO ₂	HKSAR	-40%	-25%	-55%
	PRDEZ*		-16%	-28%
NO _x	HKSAR	-20%	-10%	-20%
	PRDEZ		-18%	-25%
RSP	HKSAR	-55%	-10%	-25%
	PRDEZ		-10%	-17%
VOC	HKSAR	-55%	-5%	-15%
	PRDEZ		-10%	-20%

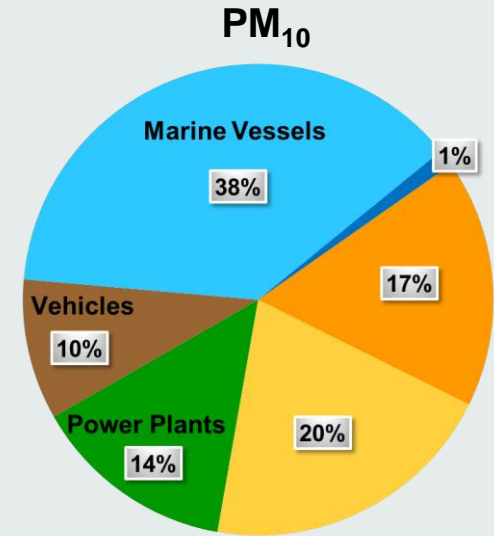
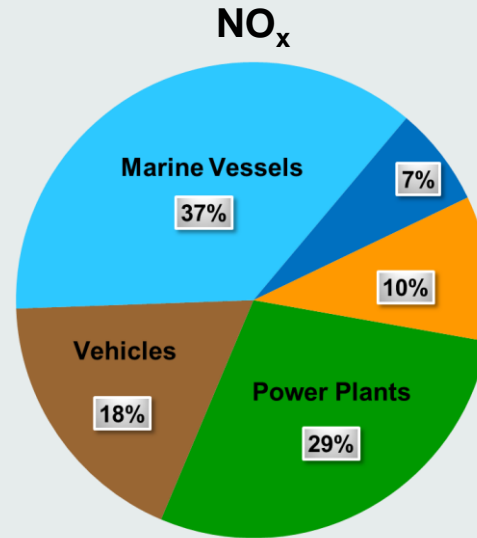
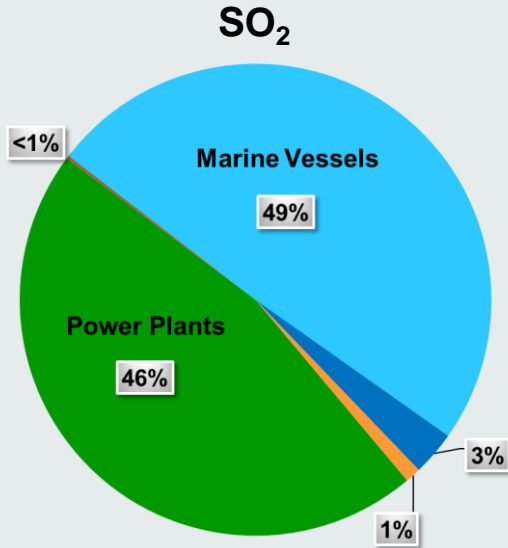
*Pearl River Delta Economic Zone, including Guangzhou, Shenzhen, Zhuhai, Dongguan, Zhongshan, Foshan, Jiangmen, Huizhou and Zhaoqing

Clean Air Plan



Local Pollution Sources (2016)

- Road Transport
- Navigation
- Civil Aviation
- Other Combustion
- Non-combustion



Vehicles

- Impose most stringent vehicle emission and fuel standards where practicable
- Phase out old diesel commercial vehicles
- Retrofit vehicles with emission reduction device

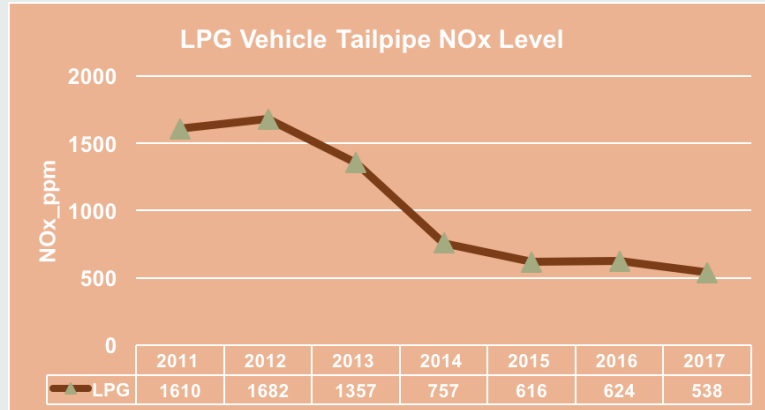
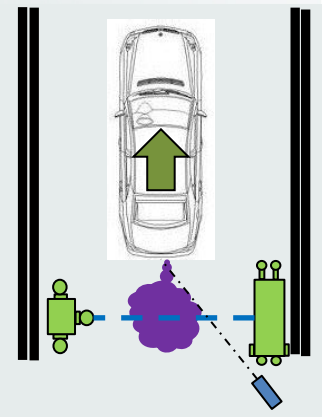
DCV retirement deadlines



Vehicles

Strengthened emission control of In-use petrol/LPG vehicles

- roadside remote sensing devices
- monitored some 2.3 million vehicle counts since September 2014
- issued about 12,800 emission testing notices





Vehicles

- Promote the use of electric vehicles and cleaner alternatives through Pilot Green Transport Fund
- Fully subsidise trials of electric and hybrid franchised buses

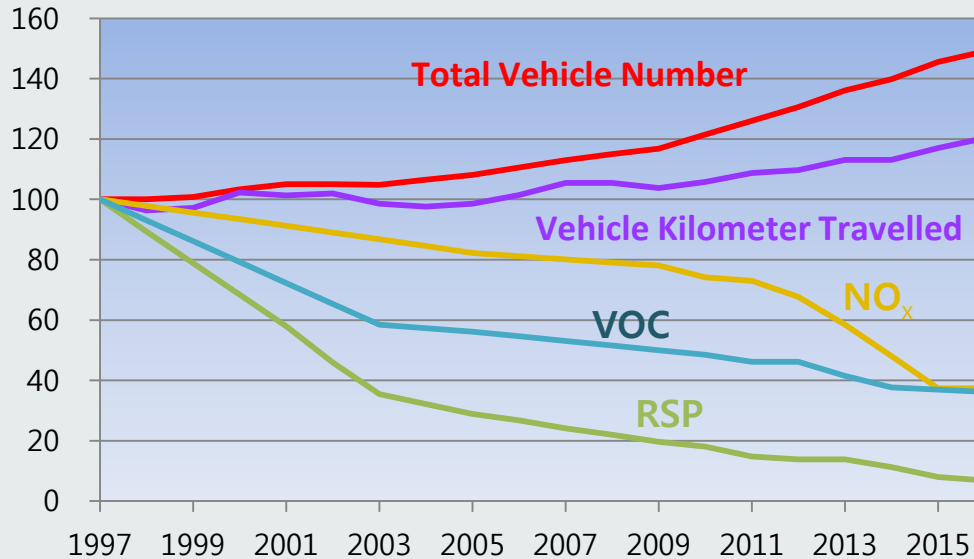


Vehicle Number

VS

Vehicular Emissions

Percentage
(Base year 1997)



Note: Between end 1997 and end 2016,
the number of licensed vehicles has grown from 500,228 to 745,677.



Progressively tightened the statutory emission caps imposed on the power sector

Installed emission reduction facilities, increased the use of natural gas, and phasing out coal-fired units

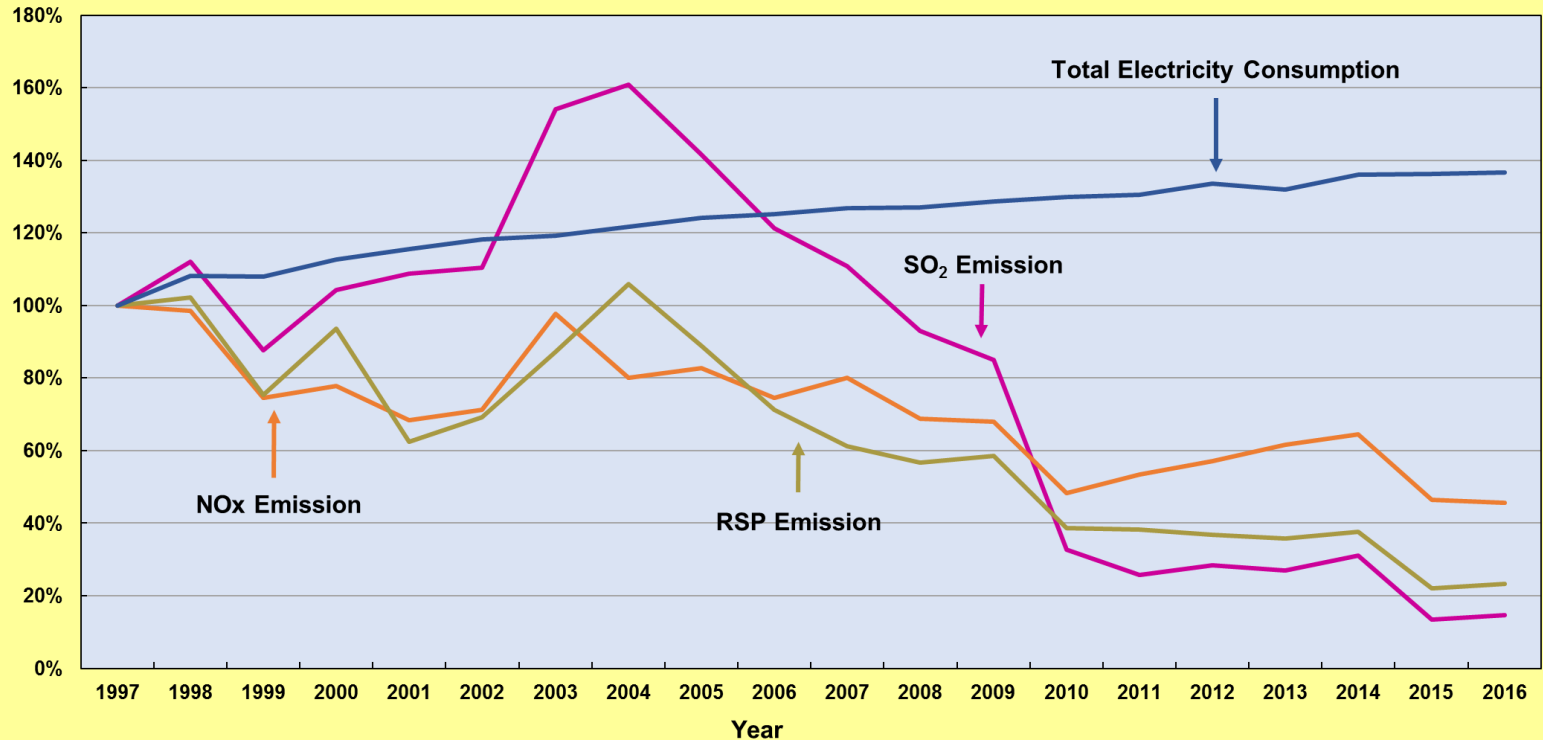
Power Plants



Emissions since the 90's

Domestic Electricity Consumption and Emissions from Power Plants

Percentage Change



Marine Vessels



January 2019

Local legislation to dovetail with the establishment of a

Domestic Emission Control Area (DECA)

in Pearl River Delta Waters

July 2015

Mandated Ocean-going Vessels at berth switch to low sulphur (0.5%) fuel

April 2014

Mandated cleaner local marine light diesel (0.05% Sulphur)
90% cleaner



Regional collaboration

- Since 2002, set emission reduction targets for NO_x, VOC, SO₂ and RSP with Guangdong for 2010, 2015 & 2020
- Pursue a wide range of measures targeting major sources
- Operate the regional air quality monitoring network since 2005
- Carry out PM_{2.5} study jointly
- Progressively implement regional VOC monitoring plan

Regional Emission Reductions in the Pearl River Delta

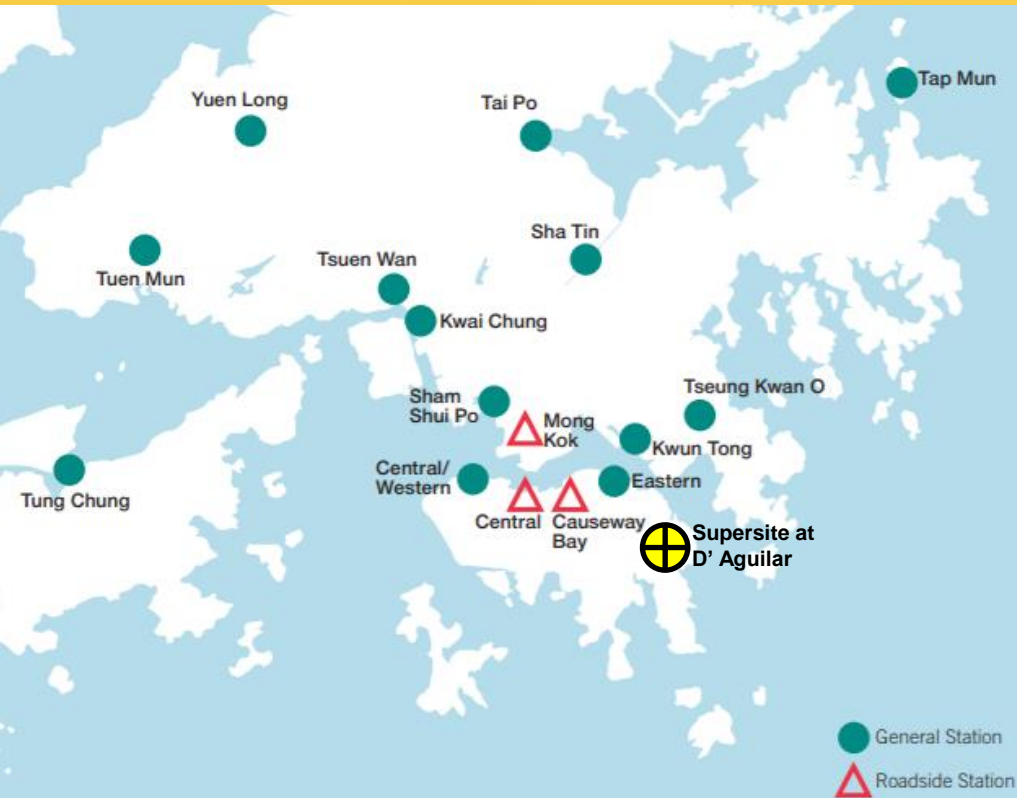
Pollutant	Area	2015 Emission Reduction Target (cf. 2010)	2015 Actual Emission Reduction (cf. 2010)
SO ₂	HKSAR	-25%	-45%
	PRDEZ	-16%	-25%
NO _x	HKSAR	-10%	-14%
	PRDEZ	-18%	-22%
RSP	HKSAR	-10%	-20%
	PRDEZ	-10%	-14%
VOC	HKSAR	-5%	-14%
	PRDEZ	-10%	-11%

An aerial photograph of a city skyline, likely Hong Kong, featuring a prominent skyscraper (the Bank of China Tower) and a harbor with several piers. The image is overlaid with a semi-transparent blue rectangle containing white text.

Feedback

Air Quality Monitoring

Air Quality Monitoring Network



AQMS

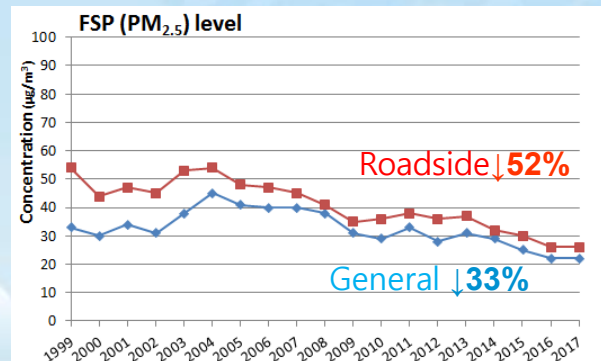
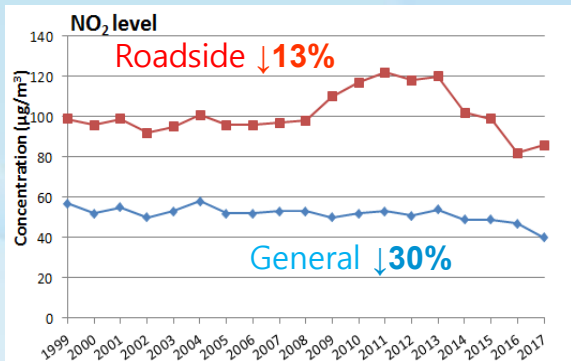
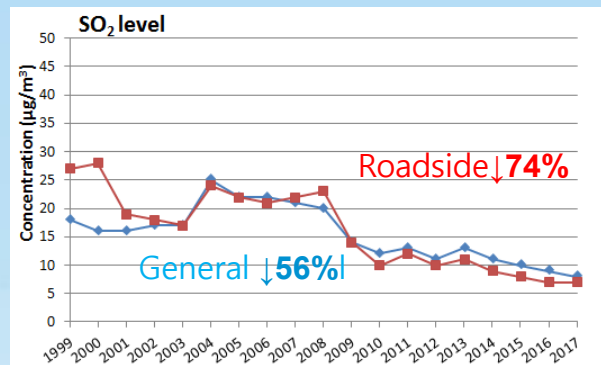
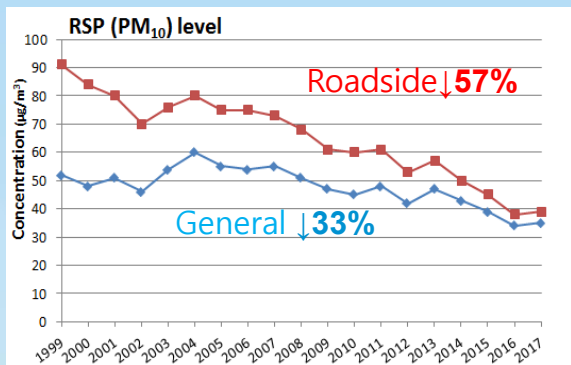


Supersite

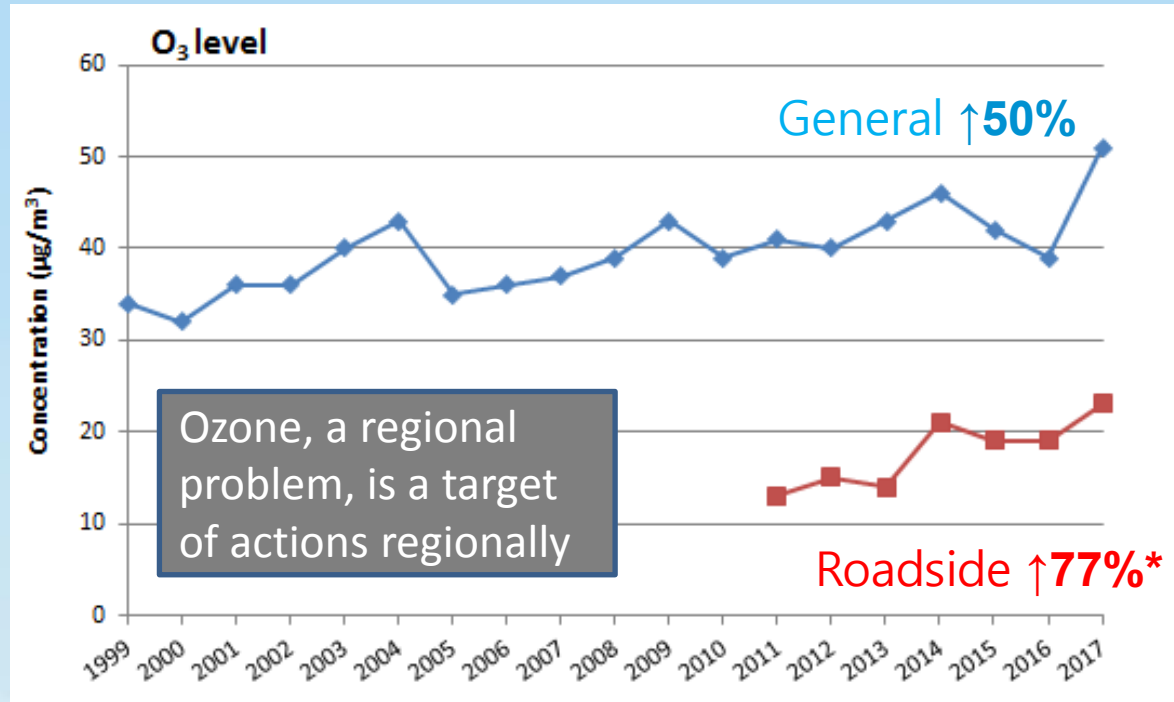


Air Quality is Improving Gradually

Air Quality (1999 – 2017)



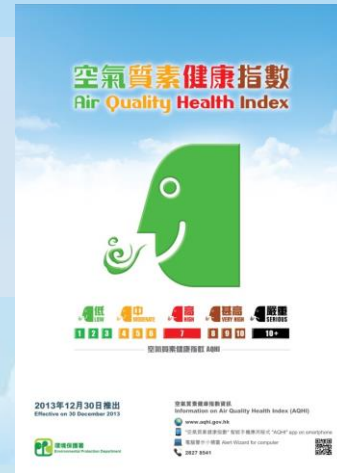
Our Next Challenge - Ozone



* Ozone was not measured at roadside stations before 2011 and comparison was made between 2011 and 2017

Air Quality Health Index (AQHI)

- Launched in December 2013
- On a scale of 1 to 10 and 10+, grouped into five health risk categories



- Calculated based on cumulative health risk attributable to 3-hour moving average concentrations of O₃, NO₂, SO₂ and RSP/FSP
- Reported hourly in website and mobile phone app with forecast

Way Forward



Air Quality Objectives (AQOs) Review

- Statutory requirement to review AQOs at least once every 5 years
- Progressive steps to tighten the AQOs to achieve the WHO AQGs
- Continual process to update the Clean Air Plan
- Current review started in 2016 and to be completed in 2018

AQOs Review Working Group (engagement of experts & stakeholders)

**Air Science &
Health**

**Energy & Power
Generation**

**Road
Transportation**

**Marine
Transportation**

空氣質素
指標檢討
AIR QUALITY
OBJECTIVES REVIEW

公眾參與 PUBLIC ENGAGEMENT

分享你對改善空氣質素的
可能新措施的意見

 環境保護署
Environmental Protection Department

Thank you

