



Efforts in Improving Air Quality

**Briefing for the Environment Committee of HKGCC
19 June 2008**

Environmental Protection Department



- **“Smog” caused by emissions from both Hong Kong and cities in the PRD region**

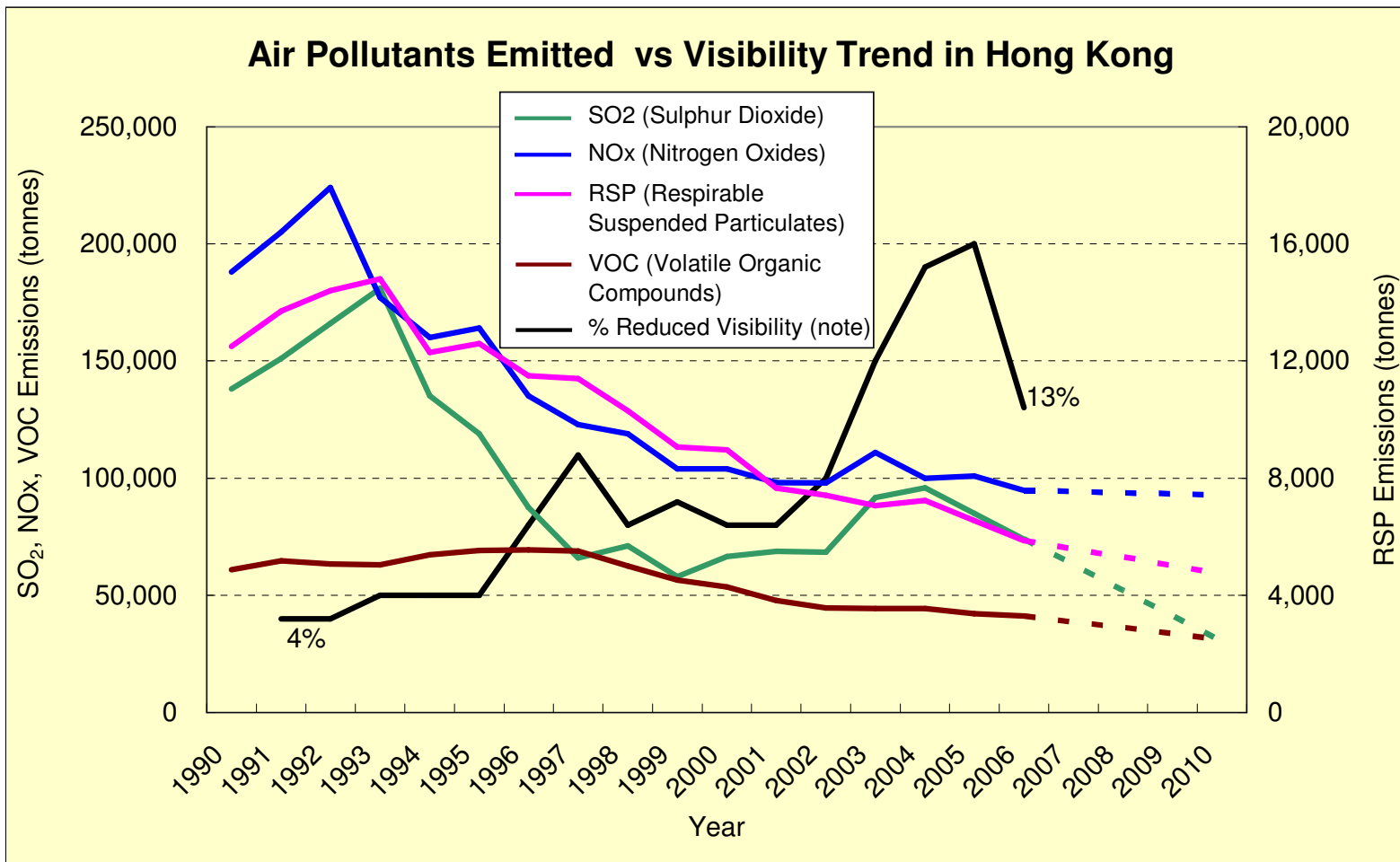


- **Under favourable weather condition**



The Problem

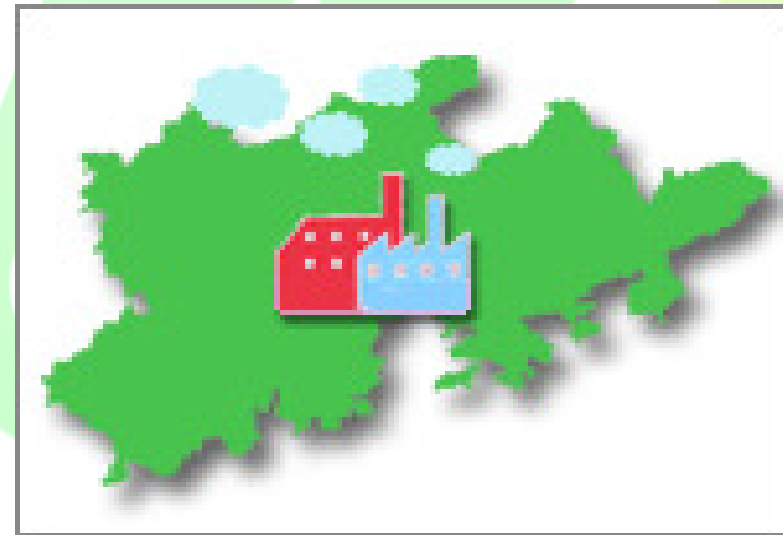
- **Although emissions of key air pollutants in Hong Kong have dropped substantially since 1990's, visibility has deteriorated significantly, reflecting worsening of the regional smog problem**



- **Percentage of Reduced Visibility** refers to the percentage of time in a year with visibility less than 8 km and Relative Humidity not exceeding 80%
- Emission figures beyond 2006 shown in dotted lines are projected data

Two Distinct Pollution Sources

- **Local pollution sources**
- **Regional pollution sources**



Measures by HKSAR – Power Plants

- **New coal-fired power plant banned since 1997**
- **Tighten emission caps**
- **Legislative amendments to:**
 - **Stipulate the emission caps for 2010 and beyond**
 - **Enable power plants to conduct emissions trading**
- **Link power companies' rate of return to achievement of emission caps**
- **Provide higher return to renewable energy facilities**



Road Transport

- **Tightened emission standard to Euro IV**
- **Require pre-Euro diesel vehicles to install emission reduction devices**
- **Provide \$3.2 billion to expedite replacement of pre-Euro and Euro I commercial diesel vehicles with Euro IV models**
- **Provide tax concession for vehicles with low emissions and high fuel efficiency**





Road Transport

- **Consult the public on banning idling vehicles with running engines**
- **Provide tax incentive to encourage the use of Euro V diesel**
- **Strengthen the control of emissions from petrol and LPG vehicles by advanced remote sensing equipment and emission test**



Maritime Sector

- **Use ultra low sulphur diesel in government vessels since 2001**
- **Study the feasibility of requiring all vessels plying the harbour to use high-quality fuel**
- **Explore with GD on more stringent measures to control emissions from vessels in PRD Region**
- **Participate in International Maritime Organization and support development of emission control measures for ports and ocean liners**



Other Sectors

- **Require vapour recovery system for vehicle refueling to be installed in all petrol stations**
- **Impose mandatory emission limits for volatile organic compounds in architectural paints, printing ink and selected consumer products**
- **Mandate the use of ultra low sulphur diesel in all industrial and commercial processes**





Collaboration with Guangdong

- **Consensus between HKSAR and GD in April 2002 to reduce by 2010 (compared to 1997):**
 - **Sulphur dioxide (SO₂) by 40%**
 - **Nitrogen oxides (NO_x) by 20%**
 - **Respirable suspended particulates (RSP) by 55%**
 - **Volatile organic compounds (VOC) by 55%**
- **PRD Regional Air Quality Management Plan in 2003**



Measures by Guangdong

- **Reduce emissions from power generation:**
 - **Continue to reduce energy intensity (i.e. energy consumed per CNY10,000 GDP)**
GD Province: -13% by 2010
 - **Install flue gas desulphurisation facilities in coal-fired power plants**
 - **Phase out highly polluting small thermal power units, small-scale cement factories, iron and steel mills**
 - **Develop new large-scale gas-fired power plants**



Measures by Guangdong

- **Reduce vehicle emissions:**

Adopt the National III (on a par with Euro III) motor vehicle emission standards and motor fuels

- **Reduce emissions from industries:**

Phase out highly polluting industrial processes and compulsory adoption of cleaner production practices for some industries

- **Control VOC emissions:**

from oil depots, tanker trucks and petrol filling stations



The Mid-term Review

- **At the 9th Plenary of the Hong Kong/Guangdong Cooperation Joint Conference held in August 2006, the two sides agreed to jointly conduct a mid-term review to:**
 - **assess the effectiveness of existing emission reduction measures**
 - **examine the emission trend of major air pollutants**
 - **recommend additional control measures as necessary**
- **The Mid-term Review was carried out by the Special Panel on PRD Air Quality Management and Monitoring**



Scope of Mid-term Review

- **Estimate the emission levels for 1997 and 2003 by adopting the same methodology**
- **Project the 2010 emission levels based on the latest socio-economic developments**
- **Assess the extent to which the emission reduction targets could be achieved based on the 2010 levels**
- **Recommend additional emission control measures where necessary**



Methodology for Emission Estimation

- **HKSAR and Guangdong used to adopt different basis and methodology for making estimations on pollutant emission levels**
- **Jointly compiled the “Handbook on Preparation of Air Emission Inventory in the PRD Region” so that emission levels are estimated on the same scientific and objective basis**
- **Enhance the comparability of results of the two sides**

Projected Growth from 1997 to 2010

Major Growth Indicator	Projected Growth in the 2002 PRD Study Report		Projected Growth in the Mid-term Review	
	HKSAR	PRD Economic Zone	HKSAR	PRD Economic Zone
Gross Domestic Product	74%	348%	72%	509%
Population	18%	19%	11%	56%
Electricity Consumption	24%	110%*	43%	158%*
Vehicle Mileage	85%	203%	8%	319%

*excluding electricity generated by nuclear power, renewable energy and provinces in Western China



Emission Reduction between 1997 & 2010 (after Implementation of the Management Plan)

Pollutant	Projected Emission Reduction from 1997 to 2010		
	HKSAR	PRD Economic Zone	Emission Reduction Target
SO ₂	-54%	-34%	-40%
NO _x	-25%	-10%	-20%
PM ₁₀	-58%	-59%	-55%
VOC	-55%	-43%	-55%



Additional Control Measures for the PRD Economic Zone

- **Requiring all new coal-fired power plants to install de-NO_x equipment**
- **Implementing more stringent local emissions standards for boilers**
- **Strengthening implementation of cleaner production standards for printing industries**
- **Introducing a labeling scheme for VOC-containing products by phases**
- **requiring VOC-containing products to meet green labeling requirements**
- **Strengthening emission control on local vessels, etc.**

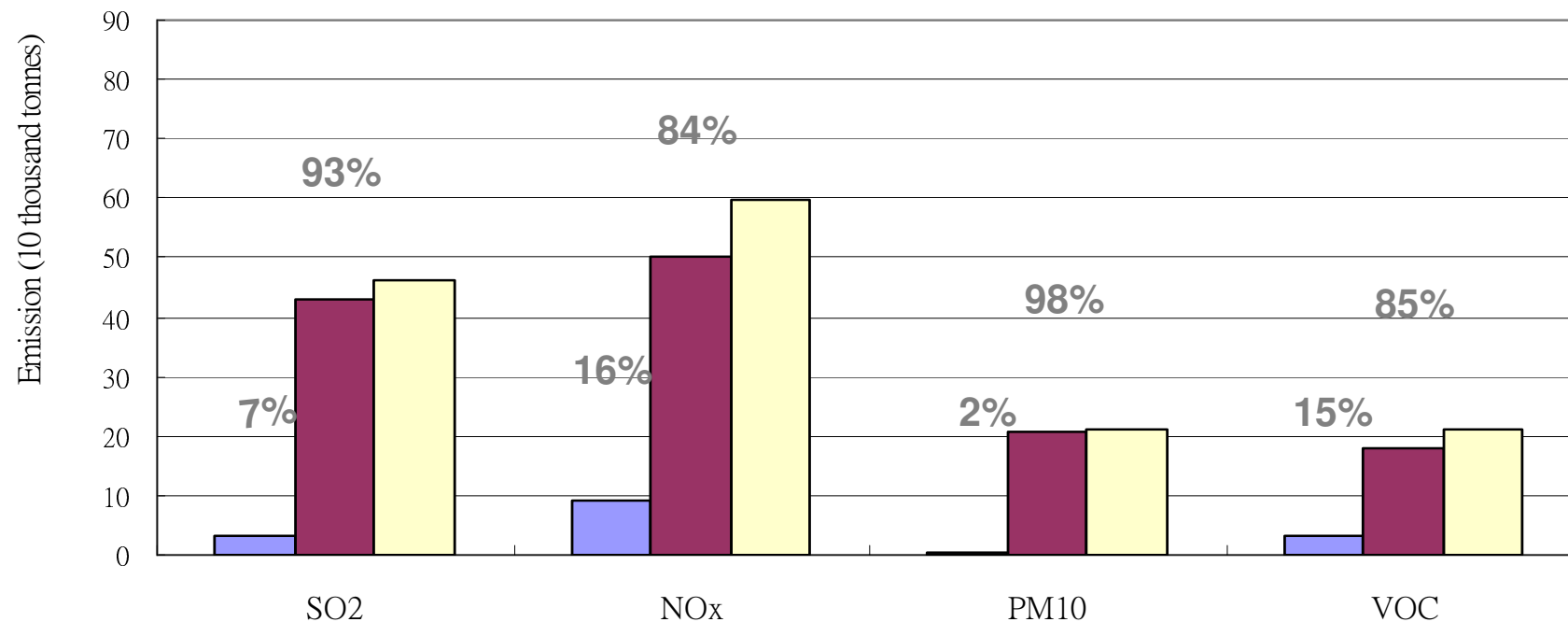
Emission Reduction between 1997 & 2010 (after Implementation of Additional Control Measures)

Pollutant	Projected Emission Reduction from 1997 to 2010	
	PRD Economic Zone	Emission Reduction Target
SO ₂	-41%	-40%
NO _x	-20%	-20%
PM ₁₀	-60%	-55%
VOC	-56%	-55%



2010 Emission Levels (after Implementation of Additional Control Measures in the PRD Economic Zone)


■ Hong Kong ■ PRD Economic Zone ■ Whole PRD Region





Mid term Review Findings

- Measures being implemented by both sides under the Management Plan would bring about positive effects on abating air pollutant emissions in the region
- **HKSAR:** Upon implementation of the current and committed measures under the Management Plan, HKSAR should be able to meet the emission reduction targets by 2010
- **PRD Economic Zone:** Guangdong could also meet the emission reduction targets after implementation of additional control measures as recommended in the Mid-term Review report



Comparison of the 1997 Emission Estimations before and after Recalculation

- **HKSAR**
 - Emissions of the four major air pollutants : differences ranging from **-14%** to **+28%**
- **PRD Economic Zone**
 - VOC emission : difference of **-3%**
 - NO_x and SO₂ emission: difference of **+41%**
 - PM₁₀ emission : more substantial at **+112%**



Main Reason for the Differences

- **In the Mid-term Review, the estimation methodology enshrined in the Handbook provides for a wider and more comprehensive coverage of pollutant emission sources, as well as more accurate and reliable emission factors and data used for making estimations.**



HKSAR Estimation

- **Adopt more accurate emission data/factors for the printing and construction sectors, and include new emission sources such as ‘Gasoline Evaporation from Gasoline Vehicles’**
- **Adopt the energy end-use database to determine diesel consumption in sectors such as ‘Commercial and Domestic Fuel Combustion’ and ‘Industrial Boilers’ etc. - more representative than the previous estimations based on retained fuel imports**
- **Use of more accurate emission factors in calculating emissions from power plant and construction sectors**



PRD Economic Zone

Power Plant and Industrial Sectors

- **In the previous estimation, data on SO₂, NO_x and PM₁₀ emissions from power plant and industrial sectors were extracted from information declared by enterprises in 1997**
- **In the Mid-term Review, a more comprehensive estimation was conducted by adopting the same fuel consumption methodology as in HKSAR**



PRD Economic Zone

Industrial Sector

- **Particulates generated in the fuel combustion and production processes to be accounted for separately according to the Handbook, the recalculation covered emissions from industrial processes which were previously excluded in the original estimations**
- **Particulates emission from vehicle tyre, brake wear and road surface wear as required by the Handbook, were also included in the recalculation**



Emission Estimations and Emission Reduction Targets

- **The 1997 emission levels were re-assessed in the Mid-term Review**
- **No change to the 2010 emission reduction targets agreed by both sides in 2002**
- **The reduction targets in respect of the four major air pollutants were set in percentage terms. Regional air quality will be correspondingly improved, when compared with 1997, so long as the required percentage reduction targets are met by both sides in 2010**



Cleaner Production Partnership Programme

Launched on 18 April 2008





Why Cleaner Production

- **About 56,000 Hong Kong-invested factories in Guangdong, employing about 10 million workers**
- **Contributing to air emission by**
 - (a) direct discharge of air pollutants from production processes, and from burning of fuel in boilers, furnaces and standby generators; and**
 - (b) consuming electricity generated from coal fired power plants**

Business Community's Initiatives

- ✓ **The Clean Air Charter - by Hong Kong Business Coalition on the Environment and the Hong Kong General Chamber of Commerce**
- ✓ **The One-One-One Programme of the Federation of Hong Kong Industries**
- ✓ **Voluntary actions by individual enterprises to fulfill Corporate Social Responsibility**



Cleaner Production Technical Support Pilot Project

- **Commenced in Nov 2006**
- **15 factories participated in the project**





Successful Examples – a Printing Factory

- **Reduction of 350 tonnes in volatile organic compounds (VOC) emissions by switching to water-based adhesive in the lamination process**
- **Saving in electricity of 1.9 million kWh a year by replacing T-8 fluorescent tubes with T-5 tubes and by replacing stand-alone vacuum pumps with a centralized system**





Successful Examples - Metal Products Factory

- Reduction of paint and solvent consumption by 18%, e.g. by using of high volume low pressure (HVLP) paint spraying guns
- Reduction of about 50 tonnes in volatile organic compounds (VOC) emission, e.g. switching to steam cleansing for degreasing processes.



Chief Executive's 2007 Policy Address

“This Programme will assist and encourage Hong Kong-owned factories within the PRD region to adopt cleaner production technologies and processes. ...reduce emissions and enhance energy efficiency as well as improve competitiveness and corporate image.”




A 5-year Partnership Programme

- **HK-owned factories in PRD**
- **Industry and trade associations**
- **Sourcing enterprises**
- **HKSAR and Guangdong Provincial governments**
- **Environmental technology (ET) service providers and HKPC**

Government funding: \$93.06 million



Factories Participation

Initiative	No. of Projects	Service Provider	Funding Support
 <p>On-site Improvement Assessment</p>	<p>800 to 1,000 in 5 years</p>	<p>HKPC and ETs</p>	<p>50% subject to a cap (HK\$15,000)</p>
 <p>Demonstration Projects</p>	<p>~90 projects in 5 years</p>	<p>HKPC and ETs</p>	<p>50% subject to a cap (HK\$160,000 on average)</p>
 <p>Performance Verification</p>	<p>500 to 1,000 in 5 years</p>	<p>HKPC</p>	<p>Fully funded subject to a cap (HK\$15,000)</p>



How HKGCC Members can help?

- **Encourage factories in their supply chain to join the Partnership Programme**
- **Collaborate in publicity activities to promote the Programme and CP message**
- **Share your valuable experiences in the implementation of Corporate Social Responsibility**



Thank You and Be a Cleaner Production Partner !

