

**For discussion on
17 July 2014**

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS**

**Collaboration with Guangdong in
Improving Air Quality in the Pearl River Delta Region**

PURPOSE

This paper informs Members of the joint efforts between the governments of Hong Kong Special Administrative Region (HKSAR) and Guangdong Province in tackling air pollution problems in the Pearl River Delta (PRD) region.

BACKGROUND

2. Improving air quality in the PRD region has been one of the important environmental collaboration initiatives between Hong Kong and Guangdong. The governments of the two sides set up a Joint Working Group on Sustainable Development and Environmental Protection (JWGSDEP) in 2000. A number of special panels have been set up under the JWGSDEP to follow up on issues of mutual concern, including improving air quality and promoting cleaner production in the PRD region. The JWGSDEP is co-chaired by the Secretary for Environment of the HKSAR Government and the Director-General of the Environmental Protection Department of Guangdong Province (GDEPD). The JWGSDEP meets annually and the two sides have been informing the public of the progress of collaboration work through joint press releases.

3. To improve regional air quality, the HKSAR Government reached a consensus with the Guangdong Provincial Government in April 2002 to reduce, on a best endeavour basis, the emissions of four major air pollutants, namely sulphur dioxide (SO₂), nitrogen oxides (NO_x), respirable suspended particulates

(RSP) and volatile organic compounds (VOC) by 20% to 55% in the PRD region by 2010, using 1997 as the base year. To achieve these emission reduction targets, the two governments implemented a basket of emission reduction measures under the PRD Regional Air Quality Management Plan, which focused on power plants, motor vehicles and the heavily polluting industrial processes. In addition, a Regional Air Quality Monitoring Network, comprising 16 monitoring stations in the PRD region, has been established by the Environmental Protection Department (EPD) of the HKSAR Government and GDEPD since November 2005.

4. A Cleaner Production Partnership Programme has also been implemented since April 2008 in collaboration with the Economic and Information Commission of Guangdong Province (GDEIC) to encourage and facilitate Hong Kong-owned factories in the PRD region to adopt cleaner production technologies and practices, thereby contributing to improving the regional air quality.

5. There have been improvements in the overall air quality in the PRD region. According to the monitoring results from 2006 to 2013, the average annual concentration levels of SO₂, nitrogen dioxide (NO₂) and RSP in the region decreased by 62%, 13% and 15% respectively. These significant reductions were attributable to the implementation of various emission reduction measures in the two places, e.g. retrofitting coal-fired generating units with desulphurization systems, tightening vehicle emission standards and fuel standards, enhancing control on industrial emissions, completing installation of vapour recovery systems at petrol filling stations, etc.

6. To further improve the regional air quality, EPD and GDEPD endorsed emission reduction targets for 2015 and emission reduction ranges for 2020 at the JWGSDEP meeting held in November 2012. As compared with the emission levels of the four major air pollutants in Hong Kong and the PRD Economic Zone in 2010, the emission reduction targets in 2015 and 2020 are shown below : -

Pollutant	Area	2010 Emission (tonnes)	2015 Emission Reduction Targets* (%)	2020 Emission Reduction Targeted Ranges* (%)
SO ₂	Hong Kong	35 500	-25%	-35% to -75%
	PRD Economic Zone	507 000	-16%	-20% to -35%
NO _x	Hong Kong	108 000	-10%	-20% to -30%
	PRD Economic Zone	889 000	-18%	-20% to -40%
RSP	Hong Kong	6 250	-10%	-15% to -40%
	PRD Economic Zone	637 000	-10%	-15% to -25%
VOC	Hong Kong	33 200	-5%	-15%
	PRD Economic Zone	903 000	-10%	-15% to -25%

* as compared with 2010 emission levels

KEY INITIATIVES IN HONG KONG

7. In March 2013, EPD unveiled "A Clean Air Plan for Hong Kong", which puts forward a series of air quality improvement measures targeting at land and marine transport, power plants and non-road mobile machinery in order to improve air quality and achieve the new emission reduction targets. Our key emission reduction measures include :

- tightening of vehicle emission standards;
- phasing out highly polluting commercial diesel vehicles;
- retrofitting Euro II and Euro III franchised buses with selective catalytic reduction devices;
- strengthening inspection and maintenance of petrol and liquefied petroleum gas vehicles;
- requiring ocean-going vessels to switch to using low sulphur fuel while at berth;
- tightening the sulphur content of locally supplied marine diesel;
- controlling emissions from off-road vehicles/equipment;
- tightening of emission caps on power plants and increasing use of clean energy for electricity generation; and
- controlling VOC contents of solvents used in printing industry.

Details and progress of the above measures have been reported to this Panel

regularly. The most recent of this is vide paper CB(1)1122/12-13(02) on “Progress Report for Air Quality Improvement Measures”.

THE MAINLAND’S AIR QUALITY IMPROVEMENT PLAN

8. The Mainland has been stepping up its efforts against air pollution. In September 2013, the State Council promulgated the Ten Air Pollution Prevention and Control Measures (Annex A). In line with the State Council’s policy, the governments of Shenzhen Municipality and Guangdong Province released respectively the Shenzhen Air Quality Enhancement Plan^[1] (Annex B) in September 2013 and the Guangdong Air Pollution Control Plan (2014-2017) (Annex C) in February 2014.

9. The two Plans set out air quality targets as well as air pollution prevention and control measures of Shenzhen and Guangdong Province respectively, including, among others, implementing desulfurization, denitrification and dust removal technologies for coal-fired power generating units; promoting cleaner power generation; improving motor fuel quality and tightening vehicle emission standards; phasing out high-emission vehicles and promoting the use of new-energy vehicles; controlling emissions from vessels and non-road mobile sources; promoting cleaner production to industries; and controlling emission of volatile organic compounds.

COLLABORATION WITH GUANGDONG

10. Collaboration between the governments of Guangdong and HKSAR will continue through the undertaking of a number of new initiatives, as set out below.

Enhancement of the PRD Regional Air Quality Monitoring Network (Network)

11. The Network has been publicizing a Regional Air Quality Index on daily basis and releasing the regional monitoring reports biannually since November 2005. The Network includes monitoring of the four major

¹ The Shenzhen Air Quality Enhancement Plan should contribute to the improvement of regional air quality in the PRD region and help achieve the PRD emission reduction targets for 2015 and 2020 set by Guangdong and Hong Kong.

pollutants, i.e. SO₂, NO₂, RSP and ozone. At present, members of the public can obtain the monitoring reports from the websites of EPD and GDEPD.

12. At the JWGSDEP meeting held in November 2012, the two sides agreed to jointly enhance the Network further. The proposals being explored include setting up additional monitoring stations, adding new monitoring parameters, and reviewing the overall calculation and reporting of monitoring results such as regional air quality index. The two sides aim to complete arrangements for the enhancement within 2014.

A joint regional study on fine suspended particulates

13. EPD, GDEPD and Macao Environmental Protection Bureau agreed in December 2013 to jointly conduct a fine suspended particulates (PM_{2.5}) study for the PRD region. The study will provide a robust scientific basis for mapping out strategies for further improvement of the regional air quality. The three sides aim to commence the joint study in late 2014 and complete it in 2016.

Exploring co-operation in controlling emissions from ocean-going vessels

14. In September 2012, Hong Kong introduced an incentive scheme to encourage ocean-going vessels to switch to low sulphur fuel while at berth. EPD plans to mandate this practice by legislation in 2015, and is working with the Guangdong authorities to explore setting up a joint task force to promote similar practice in other ports in the region.

Regional collaboration on cleaner production

15. The Cleaner Production Partnership Programme has been making good progress in engaging Hong Kong-owned factories to adopt cleaner production technologies and practices. In light of the environmental benefits of the programme and the positive feedback from industries, the Government has extended this five-year programme by two years to 31 March 2015. A total funding of \$143 million has been committed to implement the programme since 2008.

16. As at end May 2014, a total of 2 325 funding applications were

approved, which included 1 304 on-site assessments, 204 demonstration projects on cleaner production technologies, and verification services on effectiveness of 817 improvement projects. Moreover, around 350 awareness and technology promotion activities were organized under the programme with over 31 000 participants.

17. In the first five-year term of the programme, it achieved an annual emission reduction of VOC by 3 400 tonnes, SO₂ by 4 400 tonnes, NO_x by 2 500 tonnes and carbon dioxide (CO₂) by 660 000 tonnes. The estimated annual energy saving also amounts to about 4 000 tera-joules and the annual saving in production costs is about \$700 million. Moreover, the programme has also fostered collaboration amongst the relevant Mainland authorities, trade and industry associations as well as environmental technology service providers in reducing pollution arising from industrial activities in the region.

18. To compliment the efforts in promoting cleaner production, the Environment Bureau and the GDEIC have jointly launched the Hong Kong – Guangdong Cleaner Production Partners Recognition Scheme since August 2009 to recognize the efforts of enterprises in pursuing cleaner production. At present, a total of 216 enterprises are holding the commendations of "Hong Kong - Guangdong Cleaner Production Partners".

Exploring co-operation in air pollution forecasting

19. In addition to the continual efforts on the cooperation in regional air pollution prevention, the environmental authorities of Guangdong and Hong Kong in December 2013 agreed in principle to explore the co-operation in air pollution forecasting.

WAY FORWARD

20. The measures to be taken forward by both Hong Kong and Guangdong should contribute to the improvement of regional air quality in the PRD region and help achieve the PRD emission reduction targets for 2015 and 2020.

21. Improving air quality in the PRD region would have substantial

benefits to public health. There will also be other socio-economic benefits such as strengthening our competitiveness as an international financial center and tourist destination and attractiveness for investments that can help create jobs and retain talents to work here.

22. Hong Kong will continue to collaborate with Guangdong and Shenzhen in the implementation of various air quality improvement measures for further improving air quality in the PRD region.

**Environment Bureau / Environmental Protection Department
July 2014**

Key Requirements of the Ten Air Pollution Prevention and Control Measures in the Mainland promulgated by the State Council

- 1 Reduce pollutant emissions through comprehensive regulation of small coal-fired boilers; accelerating retrofit of desulfurization, denitrification and dust removal installations in key sectors; implementing fugitive dust control in cities; enhancing motor fuel quality and phasing out high emission (yellow-label) vehicles within a time limit.
- 2 Strictly control the expansion of production capacity of high energy consumption and high polluting industries
- 3 Vigorously promote cleaner production and public transport.
- 4 Accelerate the reformation of energy structure and increase clean energy supplies such as natural gas
- 5 Strengthen the requirements on energy-saving and environmental standards, and disapprove commencement of projects which cannot pass environmental impact assessment.
- 6 Raise the pollutant emission charges and strengthen international cooperation to develop environmentally friendly and new energy industries
- 7 Formulate or revise the emission standards of key sectors, propose amendments to the Law on the Prevention and Control of Atmospheric Pollution and mandate disclosure of environmental information on high polluting industries and enterprises
- 8 Establish co-prevention and co-control mechanism in regions and strengthen the control of PM2.5 in densely populated areas and major cities
- 9 Incorporate heavy pollution weather into the ad hoc contingency management plan of the local government.
- 10 Advocate environmental saving, green consumption and style of living, and mobilise universal participation in environmental protection and monitoring.

Source of information

The Ministry of Environmental Protection - <http://www.mep.gov.cn/zxbd/rdzl/dqst/>

**Key Emission Reduction Measures of
Shenzhen Air Quality Enhancement Plan**

(A) Strictly control pollutant emissions from new projects

- 1 New coal-fired power plants will not be built in principle. All thermal power plants under construction or expansion will have to meet the total emission limits of sulphur dioxide and nitrogen oxide.
- 2 Control the use of polluting fuels and promote integrated heat supply and use of excess heat
- 3 Strengthen cleaner production requirements for new paint-coating projects

(B) Strengthen Vehicle Emission Control

- 1 Introduce National V motor diesel fuel
- 2 Implement National IV diesel vehicle emission standards and progressively implement National V emission standards for petrol and diesel vehicles
- 3 Regularly replace tail-pipe purifying devices
- 4 Expedite the phasing out of yellow-label vehicles
- 5 Promote the use of cleaner energy vehicles
- 6 Expedite the construction of gas filling stations and electric vehicle charging facilities
- 7 Designate low emission zones for vehicles

(C) Strengthen emission control for vessels at berth

- 1 Enhance installations of shoreside power supply
- 2 Complete the installation of vapour recovery systems at oil ports. Except facilities for emergency use, switch all diesel trucks to gas trucks in container terminals and convert all oil-driven rubber tyre gantry cranes to electric ones.
- 3 Tighten the control of sulphur content of vessel fuels :
 - Strive to set up a pioneer Sulphur Emission Control Area in the PRD waters, and require ocean-going vessels to use fuel with sulphur content of 0.1% or below while at berth or sailing within 24 nautical miles from shore.
 - Provide financial subsidies to vessels using low sulphur fuel while at berth from January to June 2014 to compensate 75% of the oil price difference. Adjustments will be made on the subsidy scheme upon assessment after July 2014.
- 4 Promote the use of LNG fuel
- 5 Restrict the sailing speed of vessels.

(D) Emission control of non-road mobile machinery

- 1 Promote the use of gas-fired or electric non-road mobile machinery.
- 2 Encourage installations of dust collection devices for diesel machinery
- 3 Formulate emission and testing standards for non-road mobile machinery

(E) Enhance control standards on industrial fuel combustion sources

- 1 Require coal-fired units to enhance the capacity of desulphurization and dust removal
- 2 Promote installations of flue gas denitrification systems in waste incineration plants
- 3 Switch the use of boilers to cleaner energy.
- 4 Enhance supervision on biomass boilers

(F) Strengthen VOC pollution control

- 1 Close down illegal production lines and phase out low technology industries
- 2 Complete the survey on VOC sources and establish a total emission control mechanism
- 3 Promote the adoption of cleaner production in the paint-coating process of industries, such as furniture manufacturing industry
- 4 Introduce pollution control to printing industry
- 5 Enhance pollution control on exhaust from paint-spraying process in the automobile repair industry
- 6 Strengthen emission control on the construction industry
- 7 Control the VOC content of consumer products and their production
- 8 Promote the use of low volatile coatings and water-based cleansing agents

(G) Step up fugitive dust control and supervision at works sites, roads, large-scale stockpiles of coal and industrial materials

(H) Prohibit open burning of yard wastes and domestic wastes

(I) Strengthen control on municipal pollution sources

- 1 Control emissions from the catering industry
- 2 Reduce household oily fume pollution

(J) Enhance the capacity of ambient air monitoring, research and emergency management

- 1 Strengthen ambient air monitoring and research work
- 2 Establish an air quality forecast, notification and emergency response mechanism.

Source of information

The Human Settlements and Environment Commission of Shenzhen Municipality –
http://www.szhec.gov.cn/gzcy/gsgg/tzgg/201309/t20130927_85881.html

**Key Emission Reduction Measures of
Guangdong Air Pollution Control Plan (2014-2017)**

(A) Step up control on industrial sources and promote desulfurization and denitrification

- 1 Enhance emission reduction in power plants
- 2 Promote pollution control on boilers
- 3 Promote installations of low-NO_x and denitrification systems and highly effective dust extractors in cement industry
4. Promote the use of cleaner energy in ceramic and sheet glass manufacturing industries and installations of flue gas desulphurization system and highly effective dust extractors
- 5 Require all petrochemical catalytic cracking processes to equip with desulphurization system.
- 6 Require all iron and steel agglomeration plants to install desulphurization and denitrification systems.

(B) Reduce VOC emission to tackle ozone pollution

- 1 Promote control on VOC emissions from industrial sources
- 2 Promote leakage detection and repair (LDAR) technology
- 3 Strengthen integrated control on exhaust of petrochemical refinement by installing exhaust recovery systems or end-of-pipe treatment facilities.
- 4 Implement VOC emission control on typical trades:
 - Require production enterprises to adopt confined and integrated technologies for production of paint-coatings, printing inks, adhesives and pesticides such that VOC exhausts can be centrally collected
 - Encourage the production and use of products using water-based, non-VOC or low VOC solvents that comply with environmental protection requirements
 - Intensify VOC emission control on industries including printing, furniture manufacturing, surface coating (automobile manufacturing), shoe-making, container manufacturing and electronic equipment manufacturing industries.
 - Enhance VOC emission control on oil (combustion fuels and solvents) storage, transportation and sales, and require installations of confined vapour recovery systems at oil depots and transportation means.
- 5 Initiate municipal VOC emission control

(C) Develop green transportation and reduce pollutant emissions from non-mobile machinery

- 1 Strengthen city transportation management
- 2 Tighten the emission standards for newly registered vehicles
- 3 Strengthen pollution control on in-use vehicles

- 4 Expedite phasing out of 'yellow-label' vehicles
- 5 Provision of National IV standard petrol and diesel for vehicles in Guangdong Province in 2014, followed by National V standard petrol and diesel by end of June 2015
- 6 Promote emission reduction from vessels, ports and other machinery

(D) Step up control on area sources to reduce fugitive dust and toxic gas emissions

- 1 Step up fugitive dust pollution control at works sites, roads and stockpiles of materials
- 2 Strictly control emissions of toxic gases

(E) Tighten environmental requirements to control the increase in air pollutant emissions

- 1 Strictly implement environmental impact assessment system
- 2 Impose stringent total emission control on pollutants.
- 3 Introduce alternatives to achieve pollutant emission reduction
- 4 Impose special national air pollutant emission limits on construction projects involving coal-fired boilers and industries of power generation, iron and steel, petrochemicals, cement, non-ferrous metal smelting and chemical industries.

(F) Optimise the distribution of industries and guide the integrated development of industries

(G) Develop green economy, phase out or reduce polluting production capacities

(H) Reform the energy structure to increase clean energy supply

(I) Step up environmental enforcement and enhance achievement on environmental monitoring.

(J) Improve the coordination and forecasting of emergency response system

(K) Improve the systems of local laws and regulations and technology standards

(L) Improve environmental and economic policies

(M) Improve the system for participation of the whole society

Source of information

The People's Government of Guangdong Province –
http://zwgk.gd.gov.cn/006939748/201402/t20140214_467051.html