For Information
July 2012

LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS
SUBCOMMITTEE ON IMPROVING AIR QUALITY

Progress of Measures under Pearl River Delta Regional Air Quality Management Plan

Purpose

This paper reports on the latest progress of air quality improvement measures implemented under the Pearl River Delta Regional Air Quality Management Plan (Management Plan).

Background

2. To improve regional air quality, the Hong Kong Special Administrative Region (SAR) 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 (SO_2), nitrogen oxides (NOx), respirable suspended particulates (RSP) and volatile organic compounds (VOC) by 40%, 20%, 55% and 55% respectively in the Pearl River Delta (PRD) Region by 2010, using 1997 as the base year.

3. Since September 2005, we have provided bi-annual reports to the Panel on Environmental Affairs (EA Panel) on the progress of meeting the 2010 emission reduction targets. Following the establishment of the Subcommittee in the LegCo term of 2008-12, we have since January 2009 been submitting reports to the Subcommittee instead. This report provides an update up to June 2012.

Emission Reduction Achieved

4 The Environmental Protection Department (EPD) has been conducting studies on emissions of air pollutants from various sources. The studies adopt the latest methodologies and locally available data with a view to better reflecting the actual emissions. Based on the results from these studies, we are assessing the emission figures for Hong Kong in 2010 and verifying the emission figures for the previous years. Preliminary findings indicate that Hong Kong can achieve the 2010 emission targets. We aim to announce the emission figures in the second half of 2012.

5. Our measures to reduce emissions from the transport and power sectors as well as through enhancing energy efficiency and collaboration with Guangdong are set out below.

Latest Measures to Reduce Emissions from Major Sources

Transport Sector

6. To reduce emissions from the local transport sector, we have rolled out the following major initiatives –

(a) to encourage the transport sector to try out green and innovative transport technologies through the $300 million Pilot Green Transport Fund which has been in operation since March 2011. Up to April 2012, 64 applications were received. We have approved 24 applications, which include trials of electric non-franchised buses, and electric and hybrid goods vehicles. The total amount of subsidies granted is about $61 million. One of the approved applications to trial electric vans started in March 2012;

(b) the Financial Committee (FC) of the Legislative Council (LegCo) has approved the allocation of $33 million to fund the full cost of procuring six hybrid buses for trial by franchised bus companies along busy corridors. The franchised bus companies are making arrangement to procure hybrid buses for the trial. We expect that the trial could commence in the first half of 2014. Moreover, the FC has approved the allocation of $180 million for franchised bus companies to purchase 36 electric buses for trial, in order to assess their performance on different routes and in different conditions;

(c) the trial of retrofitting Euro II and III franchised buses with selective catalytic reduction (SCR) devices commenced in September 2011 and February 2012. Subject to satisfactory trial results, the Government will fully subsidize the bus companies to retrofit SCR devices on Euro II and III franchised buses. In order to expedite the SCR retrofit programme, we are discussing with the franchised bus companies the necessary preparation work for the large-scale retrofitting exercise;

(d) regarding the designation of pilot low-emission zones (LEZs) for franchised buses along busy corridors in Causeway Bay, Central and Mong Kok, the franchised bus companies have accorded priority to the deployment of low-emission franchised buses (i.e. those meeting the emission level of Euro IV or above) to routes serving the pilot LEZs as

far as practicable. Our target is to have only low-emission franchised buses in these zones by 2015;

(e) newly registered vehicles are required to meet Euro V emission standards starting from June 2012, except newly registered light goods vans will have to meet the same standard starting end-December 2012;

(f) the FC approved in April 2012 the allocation of $150 million for the provision of a one-off subsidy to assist owners of petrol and LPG taxis and light buses to replace their catalytic converters and oxygen sensors once. We are proceeding with the tendering procedures for the supply of parts and replacement services, with a view to starting the replacement work by end-2012 and completing it before the tightened emission control on petrol and LPG vehicles commences in mid-2013;

(g) to encourage more ocean-going vessels (OGVs) to switch to cleaner fuel while berthing in Hong Kong waters, the Financial Secretary proposed in the 2012-13 Budget to reduce by half the port facilities and light dues charged on OGVs using low sulphur fuel while at berth in Hong Kong. The scheme will span three years. We have consulted the EA Panel on the implementation framework and aim to roll out the scheme in the third quarter of 2012; and

(h) we have consulted stakeholders on tightening the sulphur content of locally supplied marine light diesel and will conduct a trial to demonstrate the technical feasibility of using low sulphur diesel. We will work out an implementation plan subject to trial findings.

7. In addition to the above, we have been implementing the following measures to promote the wider use of more environment-friendly vehicles –

(a) since April 2007, we have been providing a reduction in First Registration Tax (FRT) to encourage the use of environment-friendly private cars. The FRT reduction rate has been raised from 30% to 45%, subject to a cap of $75,000 per car. As at end-April 2012, we approved 33,170 applications. Since the introduction of the scheme, environment-friendly private cars account for about 18% of first-registered private cars;

(b) since April 2008, we have reduced the FRT of environment-friendly commercial vehicles (currently pitched at the Euro V standards) to encourage early take-up of these vehicles. As at end-April 2012, we approved 7,760 applications. Since the introduction of the scheme, environment-friendly commercial vehicles account for about 31% of first-registered commercial vehicles;

(c) since June 2010, businesses may claim 100% deduction under profit tax in respect of the capital expenditure incurred for purchasing environment-friendly vehicles. The new tax concession has been applicable starting from the year of assessment 2010/11;

(d) since July 2010, we have been providing a one-off grant to encourage vehicle owners to replace their Euro II diesel commercial vehicles early by new ones meeting the prevailing statutory emission standards. As at end-April 2012, we approved 3,103 applications, accounting for about 12% of the eligible vehicles.

(e) to provide incentives for vehicle buyers to choose electric vehicles (EV), we have extended the waiver of FRT for EVs for a period of five years till end-March 2014; and

(f) we have been encouraging EV suppliers to bring more EV models to the Hong Kong market. We have also been expanding our EV charging infrastructure to promote the wider adoption of EVs. As at June 2012, there are about 1,000 standard EV chargers all over the territory for public use. On the other hand, we now have five quick chargers and another five will be ready by end-2012.

Power Sector

8. Power generation is a major source of air pollutant emissions in Hong Kong. We amended the Air Pollution Control Ordinance in 2008 to give statutory effect to emission caps imposed through Technical Memoranda (TM) for power plants. Stringent emission caps for 2010 were subsequently imposed on the two power companies through the First TM promulgated in December 2008. We further tightened the emission caps for 2015 and thereafter with the Second TM promulgated in December 2010, reducing the emission allowances for SO_2, NOx and RSP by about 50%, 35% and 34% respectively from the levels in the First TM.

9. We have completed the review of the Second TM and found scope to further tighten the emission caps if both power companies could increase the use of low emission coals and upkeep the performance of their emission control devices, in addition to those measures required for meeting the 2015 emission caps stipulated in the Second TM. We plan to table a new TM for vetting by the LegCo by the end of 2012 to stipulate a set of new emission caps effective from January 2017. As compared to the Second TM, the new emission caps will be tightened by 17%, 6% and 10% for SO_2, NOx and RSP respectively.

10. To encourage Hongkong Electric (HEC) and CLP Power (CLP) to take further steps to reduce emissions and sustain strict compliance with the

environmental requirements, we set out a number of incentives and penalty arrangements in the Scheme of Control Agreements signed with them in January 2008. These arrangements include –

(a) linking the permitted rate of return of the two power companies to their compliance with the emission caps. A higher rate of return will be provided for emissions lower than the caps; and

(b) providing a higher rate of return to the power companies for their investment in renewable energy facilities and offering them a bonus in permitted return depending on the extent of renewable energy usage in their electricity generation.

11. Major progress in reducing emissions from the power sector also includes the following –

(a) in August 2008, the Hong Kong SAR Government signed a Memorandum of Understanding on Energy Co-operation with the National Energy Administration to ensure a stable and long-term supply of natural gas (from three different sources namely offshore gas, piped gas and liquefied natural gas) and nuclear electricity;

(b) on promotion of renewable energy, HEC commissioned a 550 kW thin film photovoltaic system in July 2010 on the roofs of the power station buildings to increase the use of renewable energy. Besides, the two power companies have proceeded with the preparation work for the collection of technical data on-site as well as the feasibility study of their off-shore wind farm projects; and

(c) both HEC and CLP have completed retrofitting emission reduction facilities for their coal-fired generation units as planned.

Other Sources

12. We are also implementing new initiatives to control emissions from other sources –

(a) we amended the Air Pollution Control (Volatile Organic Compounds) Regulation (Chapter 311W) in October 2009 to extend the control to other products, including adhesives, sealants, vehicle refinishing paints, marine vessel paints and pleasure craft paints, to limit their VOC contents in phases. The extended control has been fully implemented since April 2012; and

(b) we have conducted consultation on a legislative proposal to control emissions from non-road mobile sources, which include mobile fuel-powered machinery widely used at the airport, container terminals and construction sites. We shall take forward the legislative exercise in the 2012-13 session of LegCo.

Air Quality Objectives (AQOs) Review

13. We announced in January 2012 a set of new AQOs (Annex A) drawn up with reference to recommendations of the World Health Organization (WHO) and the practice of advanced countries such as the European Union and the United States. After consulting the Advisory Council on the Environment and the LegCo, we are now making amendments to the Air Pollution Control Ordinance with a view to giving effect to the new AQOs in 2014. Meanwhile, the Government will endeavour to adopt them as the planning and design standards in public works for which the environmental impact assessment studies have not yet commenced. We are also taking active steps towards the early attainment of the new AQOs through implementing a package of 22 control measures (Annex B).

Promotion of Energy Efficiency

14. Apart from the above, we have been reducing emissions through enhancing energy efficiency and promoting energy conservation. In this regard –

(a) in November 2010, the Buildings Energy Efficiency Bill was enacted to improve energy efficiency in new and existing buildings by mandating compliance with the Building Energy Codes. The Buildings Energy Efficiency Ordinance will commence full operation by September 2012;

(b) we set up buildings energy efficiency funding schemes in April 2009, with $450 million allocated from the Environment and Conservation Fund, to subsidize qualified building owners in carrying out energy-cum-carbon audits and energy efficiency projects. As at mid-July 2012, we approved over 990 funding applications (with grants amounting to over $380 million), benefiting over 6,000 buildings in total. This means that more than one in seven buildings in Hong Kong have benefited from the Schemes;

(c) we have adopted a comprehensive target-based green performance framework for government buildings and set targets in various environmental aspects to promote environmental protection and energy conservation. We will also promote the use of energy efficient designs and technologies by means of demonstration projects;

(d) phases I and II of a District Cooling System at the Kai Tak Development are under construction to provide chilled water to buildings in the region for centralized air-conditioning;

(e) we introduced a mandatory Energy Efficiency Labelling Scheme through the Energy Efficiency (Labelling of Products) Ordinance (Chapter 598) to encourage the use of energy-efficient products. The two phases of the scheme cover five types of product, namely room air conditioners, refrigerating appliances, compact fluorescent lamps, dehumidifiers and washing machines);

(f) we are promoting the replacement of incandescent light bulbs by energy-efficient lighting installations through various means. We have consulted the public on progressively restricting the sales of energy-inefficient incandescent light bulbs through legislation, and are consolidating public responses; and

(g) we promulgated the "Guidelines on Industry Best Practices for External Lighting Installations" in January 2012 to encourage early actions by stakeholders to minimize nuisance and energy wastage of external lighting. Moreover, we set up the Task Force on External Lighting in August 2011 to advise on the development of technical standards and parameters for external lighting specific to local circumstances, as well as the way forward in handling external lighting issues. We will take follow-up actions to address public concerns on external lighting having regard to the advice of the Task Force.

Co-operation with Guangdong Province

15. To continue improving the air quality of the PRD region, the Guangdong Provincial Government has been implementing various emission reduction measures under the Management Plan, which focus on power plants, motor vehicles and the more polluting industrial processes. Key initiatives being implemented recently include the following –

(a) requiring the installation of low-NOx and denitrification systems at thermal power plants. All large-scale coal-fired generation units are required to be retrofitted with such devices by the end of 2013;

(b) continuing to phase out highly polluting industrial boilers;

(c) progressively supplying National IV standard petrol within the whole PRD region; and

(d) promoting green freight trade by offering rebates to transportation companies for procuring and installing energy saving facilities.

16. In addition, Guangdong will implement measures to reduce pollutant emissions from large-scale industrial boilers and by construction material, metallurgical and petrochemical industries in the PRD region. They will be required to adopt such technologies as flue gas desulphurization, dust removal, low-NOx and denitrification. Guangdong authorities will also take steps to further tighten the vehicle emission standard, with a view to further improving the regional air quality.

17. Furthermore, we are working on the following joint initiatives with the relevant authorities in Guangdong to improve the regional environment –

(a) continuing implementation of the five-year Cleaner Production Partnership Programme in collaboration with the Economic and Information Commission of Guangdong Province. The programme aims to encourage and facilitate Hong Kong-owned factories operating in the PRD region to adopt cleaner production technologies and practices, thereby reducing emissions and enhancing energy efficiency. As at end-May 2012, over 1,890 applications were approved under the programme.

(b) reporting the real-time hourly concentration of fine suspended particulates (PM2.5) since March 2012. This has facilitated the general public to better understand the PM2.5 level in the PRD region; and

(c) jointly released a report on the monitoring results of the PRD Regional Air Quality Monitoring Network (Network) for 2011 in April this year. The average annual concentrations of SO2, nitrogen dioxide (NO2) and RSP in the region have decreased by 49%, 13% and 14% respectively as compared with 2006 (when the Network began operation). The average annual concentration levels of SO2 and NO2 have also decreased by 4% and 7% respectively as compared to the 2010 levels, while that of RSP has remained stable. These reductions are attributable to the implementation of enhanced emission reduction measures by both sides.

Next Steps

18. Members are invited to take note of this progress report. We will submit an update to Members in early 2013.

Environment Bureau / Environmental Protection Department
July 2012

Annex A

Proposed New AQOs

Pollutants	Avg. Time	Existing AQOs		Proposed AQOs				
		(µg/m3)	No of Exceed-ances Allowed	WHO IT-1[3] (µg/m3)	WHO IT-2[3] (µg/m3)	WHO IT-3[3] (µg/m3)	WHO AQG (µg/m3)	No of Exceed-ances Allowed
Sulphur Dioxide	10-min	--	--	-	-	-	500	3
	24-hr	350	1	125	50	-	20	3
Respirable Suspended Particulates (PM10)	24-hr	180	1	150	100	75	50	9
	Annual	55	NA	70	50	30	20	NA
Fine Suspended Particulates (PM2.5)	24-hr	--	--	75	50	37.5	25	9
	Annual	--	--	35	25	15	10	NA
Nitrogen Dioxide	1-hr	300	3	-	-	-	200	18
	Annual	80	NA	-	-	-	40	NA
Ozone	8-hr	240 [1]	3	160	-	-	100	9
Carbon Monoxide	1-hr	30,000	3	-	-	-	30,000	0
	8-hr	10,000	1	-	-	-	10,000	0
Lead	Annual	1.5 [2]	NA	-	-	-	0.5	NA

Proposed new AQOs

[1] There is no existing 8-hour AQO for ozone in Hong Kong. The figure presented above is the 1-hour AQO.

[2] There is no existing annual AQO for lead in Hong Kong. The figure presented above is the 3-month AQO.

[3] The WHO accepts the need for governments to set national standards according to their own particular circumstances. The WHO guidelines therefore also suggest ITs on SO2, PM10, PM2.5 and O3 to facilitate a progressive approach for achieving the ultimate AQGs and provide milestones in achieving better air quality.

Annex B

Air Quality Improvement Measures

1. Emission Capping and Control

(i) Increasing the ratio of natural gas in local electricity generation to 50% with additional emission abatement measures

(ii) Early retirement of aged / heavily polluting vehicles

(iii) Earlier replacement of Euro III commercial diesel vehicles with models meeting latest Euro standards

(iv) Wider use of hybrid / electric vehicles or other environment-friendly vehicles with similar performance

(v) 0.1% sulphur diesel for local vessels subject to confirmation of technical feasibility

(vi) Government vessels adopt feasible measures to reduce nitrogen oxides emissions

(vii) Electrification of aviation ground support equipment

(viii) Emission control for off-road vehicles / equipment

(ix) Strengthening volatile organic compounds (VOC) control

2. Traffic Related Measures

(x) Pilot low emission zones for franchised buses

(xi) Car-free zone / pedestrianisation scheme

(xii) Bus route rationalization

3. Infrastructure Development and Planning

(xiii) Expand rail network

(xiv) Develop cycle tracks in new development areas

4. Energy Efficiency Measures

(xv) Mandatory implementation of the Building Energy Codes

(xvi) Energy efficiency standards for domestic electrical appliances

(xvii) Light-emitting diode (LED) or equivalent alternatives for traffic signal / street lighting

(xviii) Tree planting / roof-top greening

(xix) District cooling system for Kai Tak Development

5. Other Measures Identified Further to the AQOs Review

Taking advantage of the latest technological developments and to meet the public's aspiratioin for early improvement to the air quality, we have put forth the following additional air quality improvement measures –

(i) Retrofit Euro II and III franchised buses with selective catalytic reduction devices to reduce their NOx emissions

(ii) Tighten the emission control regime on emissions from LPG and petrol vehicles through remote sensing equipment and dynamometer tests

(iii) Seek to collaborate with PRD governments in reuiring ocean-going vessels to switch to cleaner fuels while berthing at PRD ports and set up an Emission Control Area in PRD waters over the longer term.