

For Information
August 2011

**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 implementation of measures, including those under the Pearl River Delta Regional Air Quality Management Plan (Management Plan), to improve air quality.

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 (SO₂), nitrogen oxides (NO_x), 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 been providing biannual reports to the Panel on Environmental Affairs (EA Panel) on the progress of meeting the 2010 emission reduction targets. We last reported to the EA Panel in January 2011. This report provides an update of development up to July 2011.

Emission Reduction Achieved

4. With the implementation of local emission reduction measures, the emission levels of the four major air pollutants dropped by 24% to 57% between 1997 and 2009. Among them, the reduction levels of NO_x, RSP and VOC had exceeded the 2010 emission reduction targets. Details are as follows –

	Emission Level in 1997 (Tonnes)	Change in Emission Level during 1997-2009¹	2010 Emission Reduction Target
SO ₂	66,200	-24%	-40%
NO _x	124,000	-33%	-20%
RSP	11,500	-57%	-55%
VOC	68,800	-57%	-55%

5. While the emission figures of 2010 are not yet available, we are confident that Hong Kong could fully achieve the 2010 emission reduction targets. A major reason is that the two local power companies have retrofitted their coal-fired power generation units with emission reduction facilities as planned. With the operation of these emission reduction facilities, the emissions of SO₂, NO_x and RSP from the power sector in 2010 are reduced by 62%, 29% and 34% respectively from the 2009 levels.

Latest Measures to Reduce Emissions from Major Sources

Transport Sector

6. To further step up the local efforts in reducing emissions from the transport sector, we are rolling out the following major initiatives –

- (a) we have set up a \$300 million Pilot Green Transport Fund to encourage the transport sector to try out green and innovative transport technologies. Starting from 30 March 2011, public transport and goods vehicle operators may apply for subsidy from the Fund. The subsidy will cover part of the product's cost for trial, including installation cost if applicable;
- (b) we are working with the franchised bus companies on the detailed arrangements for procuring six hybrid buses for trial along busy corridors. The trial, which is fully funded by Government, aims to test the operational efficiency and performance of these buses under Hong Kong conditions and collect operational data. Taking into account the time needed for the tendering process, production and delivery, we anticipate that the trial could commence within 2012. In addition, if the bus companies wish to test other greener buses such as electric buses, Government will be ready to provide them with the same

¹ The percentage changes in emission levels between 1997 and 2009 are preliminary figures.

financial support. One of the franchised bus companies has proposed to Government to conduct a trial on electric buses. We are following up with the relevant franchised bus company on the details of its proposal;

- (c) we are preparing for a trial to retrofit Euro II and Euro III franchised buses with selective catalytic reduction devices to upgrade their emission performance to the level of Euro IV and Euro V buses respectively. We anticipate that the trial could commence in the third quarter of this year. We will review the initial results after the first six months of the trial. Subject to satisfactory trial results, the Government will fully fund the retrofit of the devices on all Euro II and Euro III franchised buses;
- (d) we are preparing for the designation of pilot low-emission zones for franchised buses along busy corridors in Causeway Bay, Central and Mong Kok. We aim to increase as far as possible the ratio of low-emission franchised buses running in these zones from 2011, with the target of having only low-emission franchised buses in these zones by 2015;
- (e) the Motor Vehicle Idling (Fixed Penalty) Ordinance, which provides for banning idling vehicles with running engines, is expected to come into force in December 2011;
- (f) in view of improvements in the supply of Euro V vehicles to the local market, we have consulted the relevant stakeholders including the transport trades on our plan to implement Euro V vehicle emission standards in 2012. We are finalizing our proposal for consulting the Panel;
- (g) we are developing a proposal to strengthen the control of emissions from in-use petrol and liquefied petroleum gas vehicles, including the use of roadside remote sensing equipment and dynamometers for emission testing; and
- (h) following a trial of powering domestic ferries with ultra low sulphur diesel (ULSD), we are working on the way forward for encouraging the marine sector to switch to cleaner fuels or adopt other emission control measures.

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

- (a) on the one-off grant scheme to encourage vehicle owners to replace their pre-Euro and Euro I diesel commercial vehicles with new ones, we made a special arrangement to allow vehicle owners who had ordered new replacement vehicles before the application deadline in end-March 2010 to retain their eligibility for application of the grant until end-March 2011. We have received about 17,300 applications (representing about 30% of the eligible vehicles) including those made under the special arrangement. Since the introduction of the scheme, the number of on-road pre-Euro and Euro I diesel commercial vehicles has been reduced from about 59,000 to 34,000 (i.e. a reduction of about 40%);
- (b) 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 which has been increased from HK\$50,000 to HK\$75,000 per car. As at end-June 2011, we have approved 21,359 applications. Since the introduction of the scheme, environment-friendly private cars account for about 14% of first-registered private cars;
- (c) since April 2008, we have reduced FRT of environment-friendly commercial vehicles to encourage early take-up of these vehicles, which are currently pitched at the Euro V standards. As at end-June 2011, we have approved 4,026 applications;
- (d) 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 is applicable as from the year of assessment 2010/11; and
- (e) 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 compliant with the prevailing statutory emission standards. As at end-June 2011, we have approved about 1,670 applications, accounting for about 6% of the eligible vehicles.

Power Sector

8. Power generation is a major source of air pollutant emissions in Hong Kong. To achieve emission reduction, we have imposed emission caps on all power plants since 2005 and are progressively tightening them during licence renewals. We further brought the Air Pollution Control (Amendment) Ordinance 2008 through LegCo in July 2008 to give statutory effect to the emission caps for power plants in

2010 and beyond through a Technical Memorandum (TM). Stringent emission caps for 2010 were subsequently imposed on the two power companies through the First TM promulgated in December 2008.

9. In 2010, we reviewed the First TM and tightened the emission caps for the power sector from 2015 onward by maximizing the use of existing gas-fired generation units and prioritizing coal-fired generation units retrofitted with emission abatement facilities. The Second TM was promulgated in December 2010. Compared with the First TM, it further reduces the emission allowance for SO₂, NO_x and RSP by about 50%, 35% and 34% respectively.

10. To encourage Hongkong Electric (HEC) and CLP Power 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 new 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. Likewise, the new arrangements provide for financial disincentives in terms of a lower rate of return for emitting more pollutants than permissible; 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. Other major progress in reducing emissions from the power sector include 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 nuclear electricity and natural gas from three different sources, namely offshore gas, piped gas and liquefied natural gas. In 2010, natural gas accounted for 30% of fuel mix for power generation in Hong Kong². To improve air quality and address the challenges posed by global warming, we will actively explore ways to accelerate the increasing use of clean energy by, for example, increasing the proportion of natural gas to account for about 40% of Hong Kong's fuel

² The figure also includes nuclear power generation from Daya Bay.

mix for power generation;

- (b) on promotion of renewable energy, the Environmental Impact Assessment Reports on developing commercial scale off-shore wind farms in Hong Kong waters by both power companies had been conditionally approved. CLP was granted with an Environmental Permit in August 2009 for their off-shore wind farm proposal off Sai Kung, while HEC was granted with the same permit in June 2010 for their proposal off Lamma Island. Besides, HEC had 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; and
- (c) both HEC and CLP have completed retrofitting emission reduction facilities for their coal-fired generation units as planned and these facilities are in full operation to help the two power companies comply with the 2010 emission caps.

Other Sources

12. We are also implementing the following major 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 from January 2010; and
- (b) we have conducted consultation on a proposal to control emissions from non-road mobile sources, which include fuel-powered machinery widely used at the airport, container terminals and construction sites. We aim to finalize the control proposal and initiate the necessary legislative procedures (including consulting the EA Panel) in 2011-12 for implementing the scheme.

Air Quality Objectives (AQOs) Review

13. We reported the findings of public consultation on the AQOs Review to the EA Panel in June 2010. We further reported to the Panel's Subcommittee on Improving Air Quality in July 2010 the key considerations in taking forward the recommended air quality improvement measures and the progress made on those measures for which concrete implementation programmes have been drawn up. Taking effective measures to reduce the emission of air pollutants is essential to improving our air quality. In updating the AQOs, we need to formulate additional air quality improvement measures for achieving the proposed new AQOs. The two

are closely connected and equally important as part of the air quality management strategy. We are now considering the best way forward to update the AQOs with a view to putting forward a proposal for discussion by the Legislative Council within this year. Meanwhile, we are taking active steps to introduce further measures to reduce emissions from various sources, including those set out in this paper.

Promotion of Energy Efficiency

14. Apart from the above, another effective way of reducing emissions is through enhancing energy efficiency and promoting energy conservation. In this regard –

- (a) in November 2010, the Buildings Energy Efficiency Bill passed into legislation to improve energy efficiency in new and existing buildings by mandating compliance with the Building Energy Codes;
- (b) we are continuing to promote the buildings energy efficiency funding schemes, 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. The schemes have been opened for application since April 2009. As at end-June 2011, we have approved more than 725 funding applications (amounting to more than \$279 million);
- (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) we will implement a district cooling system at the Kai Tak Development to supply 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 initial phase of the scheme, which covers three types of product (namely room air conditioners, refrigerating appliances and compact fluorescent lamps), has been fully implemented since November 2009. The second phase covering washing machines and dehumidifiers commenced in March 2010, with a grace period of 18 months for the trades to make necessary preparations;

- (f) we are promoting the replacement of incandescent light bulbs by energy-efficient lighting installations through various means. We are consulting the public on progressively restricting the sales of energy-inefficient incandescent light bulbs through legislation; and
- (g) we have completed the consultancy studies on energy wastage arising from excessive use of external lighting. We will soon promulgate a set of Guidelines on Industry Best Practices for External Lighting Installations to encourage voluntary action to minimize light nuisance and energy wastage.

Co-operation with Guangdong Province and Mainland

15. To continue improving the air quality in the Pearl River Delta Region, the Guangdong Provincial Government is working in earnest to implement the emission reduction measures under the Management Plan, which focus on power plants, motor vehicles and the more polluting industrial processes. New initiatives include the following –

- (a) the “Implementation Plan for Installing Low-NO_x and Denitrification Systems at Thermal Power Plants in Guangdong” was announced in January 2011. All large coal-fired power plants in the PRD region are required to complete the installation by the end of 2013;
- (b) the authorities are planning to gradually supply National IV standard petrol within the PRD region. Guangzhou and Shenzhen have started to supply such fuel in August 2010 and January 2011 respectively, and there are plans to extend the supply to other PRD cities within this year;
- (c) newly registered light duty petrol vehicles and gas vehicles in the PRD Region are required to comply with the National IV emission standards (which are on a par with the Euro IV standards);
- (d) the authorities are implementing strengthened vehicle inspection and labeling regulatory schemes for in-use vehicles, and progressively implementing road use restrictions on motor vehicles not meeting relevant standards;
- (e) new emission standards are implemented for boilers and polluting industries (including cement production, furniture manufacturing, printing, shoe-making and surface coating of automobile manufacturing industries);

- (f) vapour recovery has been introduced at petrol filling stations, oil depots and tanker trucks in the PRD Region; and
- (g) the closing down of serious polluting industries (including cement plants as well as iron and steel plants with low production capacity) continues.

16. The two governments are conducting a final assessment of the delivery of the 2010 emission reduction targets. In addition, the two sides are actively undertaking a study on the post-2010 arrangements for emission reduction in the PRD Region, which is aimed for completion within 2011.

17. Furthermore, we are working on the following joint initiatives with the Mainland authorities to improve regional air quality –

- (a) we are working with the Economic and Information Commission of Guangdong Province to implement the five-year Cleaner Production Partnership Programme. The objective is 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-June 2011, about 1,300 applications have been approved under the Programme; and
- (b) in April 2011, both sides jointly released a report on the monitoring results of the PRD Regional Air Quality Monitoring Network for 2010. We are seeing fruitful outcome of efforts taken by both sides. The results show that the average annual concentrations of SO₂, nitrogen dioxide (NO₂) and RSP in the PRD Region decreased by 47%, 7% and 14% respectively as compared to the figures of 2006 when the Network started to operate. Moreover, while the average annual concentration of NO₂ remained more or less the same as compared to the 2009 level, the average annual concentrations of SO₂, RSP and ozone decreased by 14%, 7% and 5% respectively in 2010 amidst continuing economic growth of the Region. These significant reductions are attributable to the implementation of enhanced emission reduction measures in Guangdong and Hong Kong.

18. Members are invited to take note of the above information.

Environment Bureau / Environmental Protection Department
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