

**For information
on 13 June 2002**

**Legislative Council
Panels on Environmental Affairs and Transport**

Air Quality in Hong Kong

PURPOSE

Last year, we briefed Members of the Panel on Environmental Affairs (EA Panel) on progress made with air pollution control measures in Hong Kong over the past decade vide Paper No. CD(1)471/00-01 and at the meeting of the EA Panel on 6 February 2001. This note provides an update.

BACKGROUND

2. A wide range of measures has been introduced in Hong Kong to improve air quality. Industrial emissions of particulates (RSP), sulphur dioxide (SO₂) and nitrogen oxides (NO_x) were reduced sharply in the early 1990s as a result of the ban on the use of high sulphur fuels, and have remained at a low level since. With the introduction of other measures, such as installation of flue gas desulphurisation system and use of low nitrogen oxides technology, emissions from local power plants have also been decreasing steadily.

3. With regard to the street level air pollution problem, the Administration renewed its effort by introducing in 1999 a new comprehensive programme to reduce motor vehicle emissions. Upon full implementation of the programme, we envisage that the RSP and NO_x emissions from motor vehicles will be reduced by 80% and 30% respectively by end-2005.

4. To address the ambient air pollution problem in the Pearl River Delta (PRD) Region, the Hong Kong Special Administrative Region (HKSAR) Government and the Guangdong Provincial Government reached a consensus on 29 April 2002 to implement long-term measures to improve regional air

quality. The two Governments have agreed to aim to reduce, on a best endeavour basis, the regional emissions of SO₂, NO_x, RSP and volatile organic compounds (VOC) by 40%, 20%, 55% and 55% respectively by 2010, using 1997 as the base year.

DETAILS

Reducing Industrial Emissions

5. Major industrial emission sources have been placed under licensing control since 1987 and high sulphur fuels have been banned since 1990. As a result of the control measures, SO₂ concentrations in industrial areas have fallen by up to 80%. Combined with the reduction in industrial activities, total industrial SO₂ emissions fell from 46,616 tonnes in 1989 to 7,045 tonnes in 2000.

6. To control VOC emissions, we have since 1994 required oil depots through licensing control to use the best available technologies, such as installation of vapour recovery systems and storage tanks of special design, to minimize their VOC emissions. Since 1999, we have required petrol filling stations and petrol delivery vehicles to be equipped with effective vapour recovery systems to control emissions of VOC during unloading. Since 2001, we have also introduced measures to reduce emissions of perchloroethylene (PCE) (one type of VOC) from dry-cleaning machines. Dry-cleaning machines that use PCE as dry-cleaning agent are required to be equipped with vapour recovery systems and they have to meet the stipulated emission standard.

7. To reduce emissions from power plants, all coal-fired plants built after 1991 are required to have flue gas desulphurisation system and low nitrogen oxide burners. All new power plants approved after 1996 are required to use natural gas. As a result, the SO₂ emissions from power plants fell from 131,600 tonnes in 1991 to 56,803 tonnes in 2000, and NO_x emissions dropped from 149,400 tonnes in 1991 to 43,627 tonnes in 2000.

8. With the introduction of the measures to reduce emissions from industries and power plants, their NO_x emissions were reduced by 71% from

1992 to 2000 and their SO₂, RSP and VOC emissions by 65%, 62% and 43% respectively from 1993 to 2000 since their peaks in the early 1990s.

Reducing Motor Vehicle Emissions

9. In the 1999 Policy Address, we announced a comprehensive programme to reduce RSP and NO_x emissions from motor vehicles. With the support of the Legislative Council, the transport trades and other stakeholders, we have today already achieved nearly 70% of the anticipated result for RSP and 80% for NO_x: RSP emissions from motor vehicles have been reduced by 55% and NO_x emissions by 25%. The cuts in emissions are also reflected in improved air quality. The concentrations of RSP and NO_x at roadside dropped by 8% and 11% respectively in 2001 compared with 1999. The number of instances where these pollutants exceeded the Air Quality Objectives fell by 45%. The number of smoky vehicles spotted has also reduced by half. The Air Pollution Index (API) readings in March 2002 were the lowest March API readings in the past three years while the April API readings were the lowest we have ever had since we launched the API system in 1995.

10. The progress of the various measures in the programme is set out below.

Stringent Motor Fuel and Vehicle Emission Standards

11. We have applied a policy to introduce the most stringent motor fuel and vehicle emission standards into Hong Kong whenever they are technologically practicable and available to Hong Kong. In this regard, we introduced ultra low sulphur diesel (ULSD) in 2000 and have since April 2002 made ULSD the mandatory motor diesel standard in Hong Kong. The European Union's plan is to mandate ULSD in 2006. Since 2001, all newly registered motor vehicles in Hong Kong have to meet Euro III emission standard. We are moving in parallel with the European Union in this regard.

Retrofit of Particulate Removal Devices

12. The programme to retrofit pre-Euro diesel light vehicles (i.e., those not exceeding 4 tonnes) with particulate removal devices was completed in October

2001. Over 80% (about 24,000) eligible vehicles had participated in the retrofit programme. We aim to introduce legislation by end-2002 to require all pre-Euro diesel light vehicles to be installed with suitable particulate removal devices.

13. The Environmental Protection Department (EPD) started a trial to retrofit pre-Euro diesel heavy vehicles (i.e., those over 4 tonnes) with catalysts in 2000. The trial found that the use of catalysts were effective in reducing the emissions of particulates, carbon monoxide, hydrocarbons and smoke of pre-Euro diesel heavy vehicles. But it was found that vehicles which needed to keep their engines running while stationary to support their on-board ancillary equipment would emit white smoke occasionally after a catalyst was installed on them. In order not to hold up the retrofit programme, we sought and obtained the Finance Committee's funding approval on 24 May 2002 for retrofitting those pre-Euro diesel heavy vehicles (about 41,000) for which suitable particulate removal devices have been identified. We plan to make the installation of particulate removal devices a pre-requisite for the renewal of licences for these vehicles after the retrofit programme has been completed. EPD will continue to search for suitable devices for the long-idling vehicles or a way to resolve the problem of white smoke. Once we have resolved the problem, we will seek funding from the Finance Committee separately for retrofitting these remaining vehicles.

Replacing In-use Vehicles with Cleaner Alternatives

14. Since the disbursement of the one-off grant of \$40,000 for every diesel taxi that is replaced by a liquefied petroleum gas (LPG) taxi in August 2000, over 15,300 (85%) diesel taxis have been replaced up to end-May 2002. Legislation has also been introduced in 2001 to require all newly registered taxis to operate on either LPG or petrol as from 1 August 2001.

15. We proposed in November 2001 to offer incentives in the form of one-off grant with deadline for applications to encourage early replacement of existing diesel light buses with electric or LPG light buses. We have finalised our proposed incentive scheme taking into account comments from the trades and Members. We intend to seek the Finance Committee's funding approval of the proposed incentive scheme before the end of the current Legislative Council session.

Idling Engines

16. In February 2001, we briefed Members via Paper No. CB(1)652/00-01 on the views collected by the Administration on control of idling engines, our analysis of the anticipated results of different control options and our proposal to issue guidelines to encourage against idling engines. By way of recapitulation, we consider that banning idling engines would reduce the nuisance caused by their exhaust and heat emissions to nearby pedestrians and residents. However, banning idling engines may not necessarily help improve air quality. This is because many vehicle drivers are likely to choose to circulate on the road instead of switching off the engine and the emissions their vehicles will produce could be more than offset the reduction in emission by those drivers who opt to switch their engine off. Banning idling engines could result in deterioration of the air pollution problem. Therefore, encouraging drivers against idling engines rather than banning it should be the preferred option.

17. To encourage drivers to turn off the vehicle engine while waiting at the roadside, we have issued guidelines to the transport operators (such as franchised buses, taxis, light buses) and private car owners. The recommendations set out in these guidelines have been worked out in consultation with the transport trade. We have also launched “no idling” publicity campaigns and events since 2001 to promote public awareness on the issue and will continue to encourage the good habit of switching off the engine while waiting. We will continue to monitor the situation, and review the guidelines as and when necessary.

Improving Regional Air Quality

18. As mentioned in Paper No. CB(1)1629/01-02 issued to Members on 29 April 2002, the Hong Kong-Guangdong Joint Study on the Air Quality in the PRD Region anticipates that the regional economy, population, electricity consumption and traffic would grow by 150%, 20%, 130% and 190% respectively by 2010, using 1997 as a base. Under these growth trends, air quality in the region will deteriorate if the two Governments do not implement improvement measures in addition to those that they have implemented or are committed to implementing.

19. For Hong Kong, the Study recognizes that motor vehicles and power plants are the major emission sources of RSP and NO_x and that the bulk of VOC emissions come from printing operations and consumer products containing VOC. It acknowledges the effectiveness of the measures already in place and to which the HKSAR Government is already committed, and that we cannot do much more to reduce emissions from motor vehicles. To achieve the emission reduction targets, the HKSAR Government will have to take the following actions –

- (a) reduce VOC emissions from sources such as printing operations and consumer products including paints and aerosol sprays of various kinds;
- (b) use cleaner fuel for power generation in order to reduce SO₂, NO_x, and RSP emissions in Hong Kong.

20. We are considering the recommended measures in detail and will draw up specific measures with regard to their feasibility. We will consult Members in due course as soon as proposed measures have been drawn up.

Environment and Food Bureau
June 2002