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For discussion on
12 May 2000

Legislative Council
Panels on Environmental Affairs and Transport

Comprehensive Control of Vehicle Emissions
Progress Report

Introduction

This paper sets out:-

- new measures that the Administration plans to pursue to further improve emission controls; and

- the progress with the vehicle emission control measures set out in the 1999 Policy Address.

Background

2. Reducing air pollution is important for the protection of public health. There is a clear link between very high pollution incidents and admissions to hospital for cardio-pulmonary illness. Of more fundamental importance is the persistently high level of respirable particulates and the rising trend of nitrogen oxide levels. Medical advice is that it is likely that these are linked to widespread endemic bronchitic symptoms in young children.

3. There are as yet no local studies on long term health effects of air pollution, but studies elsewhere have shown strong association between exposure to particulates, Nitrogen oxides, Sulphur dioxide and Ozone and non-accidental death from respiratory disease and lung cancer.

4. Members were briefed on 5 November 1999, 16 December 1999 and 20 January 2000 on measures to control diesel vehicle emissions contained in the 1999 Policy Address. Members were advised that implementation of the these measures would contribute towards the objective of cutting particulates and nitrogen oxides emitted from the motor vehicle fleet by 80% and 30% respectively by the end of 2005[1]. They would help bring about observable improvements in the level smoke and fumes experienced by the public on the streets and help reduce haze and photochemical smog.

5. Members were advised that vehicle emission control measures were a core part of the comprehensive air emission control programme, contributing to the improvement of air quality in Hong Kong and the protection of public health. The comprehensive air emission control programme was outlined for Members in EA Panel Paper CB(1)1603/98-99(03), considered on 2 July 1999, and in the document 'Clean Air for Hong Kong' published in June 1999.

6. Paragraph 7 below sets out new measures that are being pursued under the air emission control programme. Paragraphs 8 to 29 provide information on the progress of items previously considered by Members.

Part A. ADDITIONAL MEASURES.

7. There is increased public awareness of the seriousness of the threat of air pollution to the health and prospects of Hong Kong. The Administration welcomes the broad support that is being given by the Legislative Council to ideas for further measures to tackle air pollution problems. We intend to pursue the additional measures set out below:

[1] As noted in reply to a Question from the Honourable Christine Loh at the Legislative Council meeting on 19th January 2000, in quantitative terms, these amount to reduction in street level emissions in the main urban area of over 1,700 tonnes a year of respirable particulates and nearly 3,000 tonnes of nitrogen oxides by the end of 2005.

A. Ultra-low Sulphur Diesel (ULSD)

Benefit	Way Forward
ULSD is a term for diesel with a sulphur content of no more than 0.005%. This is 10 times lower than the present standard. Use of ULSD reduces particulate emissions from different categories of diesel vehicle by between 10 and 30% and nitrogen oxides by about 5%.	All Government diesel vehicles are to use ULSD. 100 will be using it by July, 700 in August and the remainder by the end of 2000. The Franchised bus companies will also be asked to switch over to ULSD together with the Government fleet. To encourage all drivers of diesel vehicles to switch to ULSD, a differential duty will be devised to offset the higher cost of ULSD so that it can be sold at a competitive price with standard diesel.

B. Incentives for cleaner vehicles

Benefit	Way Forward
Vehicles powered by natural gas (either compressed or liquefied) have low emissions comparable to LPG – virtually no particulate; 20 – 50% less Nitrogen Oxide and 20 – 60% less hydrocarbon than the present diesel standards (EURO II). Hybrid vehicles – combined diesel or petrol and electric motors – have up to 50% less emissions than fully diesel or petrol equivalents. Fuel cell technology – which converts hydrogen into electric power - offers the prospect of only trace emissions at street level.	The administration will introduce an incentive scheme to encourage the trial and introduction of vehicles using these new fuels or technologies. Reference will be made to the emission reduction potential of the different engines in setting the level of incentive.

C. Acceleration of Replacement of old vehicles

Benefit	Way Forward
Diesel vehicles bought before the introduction of the EURO standards in 1995 emit over 80% more particulate than new vehicles, even when well maintained, together with higher hydrocarbon and nitrogen oxide emissions. Their emissions can be reduced by fitting particulate traps and diesel catalysts, and by use of ULSD, but they will still be three to four times higher than vehicles meeting the latest standards. More rapid replacement of older vehicles would bring forward the benefit of reduced emissions associated with new vehicles.	A package of measures to encourage the scrapping of pre-Euro vehicles and replacement by cleaner new alternatives will be prepared. This would include a balance of positive incentives to acquire cleaner replacements and disincentives against keeping pre-Euro vehicles on the road.

D. Cleaner Light Vans and Light Goods Vehicles

Benefit	Way Forward
There are over 73,000 light diesel vehicles apart from taxis and light buses. About 60% are light vans of 3 tonnes weight or less. The rest are light goods vehicles of around 5 tonnes in weight. They emit about 25% of the particulate and 13% of the nitrogen oxides in the main urban areas. Introducing ULSD, particulate traps and EURO III engines for new vehicles in this category will cut particulate emissions by about 5%. Petrol alternatives to diesel light vans are already available on the market. Compared with diesel they emit over 90% less particulate and 20 to 50% less NOx. New fuels and technologies will reduce emissions further.	[The Task Force will consider practicable ways of phasing out light diesel vehicles.

E. Enhanced Hydrocarbon recovery system

Benefit	Way Forward
Evaporation of hydrocarbons, particularly from petrol, contributes towards photochemical smog formation. Certain types of hydrocarbon also need to be controlled due to their toxic effects. Vapour recovery devices on petrol pumps can reduce emissions during refilling by 90%.	Vapour recovery devices are now widely used in the USA. Legislation will be introduced in the next session to require the installation of such devices in all petrol filling stations.

F. Strengthened Enforcement

Benefit	Way Forward
Sub-standard diesel brought into Hong Kong from the Mainland and industrial diesel illegally diverted to vehicle use has a sulphur content 10 times higher than the current vehicle diesel standard and 100 times greater than ULSD. Removing this fuel from use would cut particulate emissions significantly.	Consideration is being given to the introduction of restrictions on the amount of fuel that may be brought into Hong Kong by cross-boundary traffic, and to requirements for the amount of fuel carried in vehicles leaving the territory. Amendments to the Dutiable Commodities Ordinance to strengthen the enforcement powers of Customs and Excise Department against use of illegal diesel are about to be considered by a Legislative Council Bills Committee.
Better maintenance significantly reduces vehicle emissions from both diesel and petrol vehicles	A basic emission test will be extended to all commercial vehicles in September 2000. Consideration will be given to further tightening the emission testing system by requiring use of chassis dynamometers during roadworthiness inspections. A review of current legislation is being undertaken to establish the most efficient means for introducing increased sanctions against repeated smoky vehicle offenders.

G. Restraint on Vehicle Numbers and Road Use

Benefit	Way Forward
Introducing restraint on vehicle numbers and road use can prevent the benefits of other emission reduction measures being eroded over time.	The requirement for new measures to restrain vehicle numbers or road use will be evaluated in conjunction with assessment of the capacity of railway development and other transport planning measures to meet transport demand.

Part B. PROGRESS WITH EXISTING MEASURES

Phasing out Diesel Taxis

8. Since January this year, Government has tendered out five large sites for exclusive use as LPG refilling stations. The terms did not require any land premium. A formula to cap the price at which LPG would be sold was required. The successful bidders have set a price for LPG that will cut the operating costs for a taxi by about $45,000 each year. This, together with the cheaper price of LPG taxis, creates a strong incentive for most taxi operators to switch to LPG as early as possible.

9. Our objective is to provide sufficient LPG refueling capacity for all 18,000 taxis by the end of 2001.

10. A separate paper on the LPG conversion programme has been issued for discussion.

Phasing out Diesel Light Buses

11. A preparatory committee comprising representatives from relevant government bureaux and departments, the light bus trade and academics with relevant expertise was set up last December to work out arrangements for the trial of alternative Light Buses.

12. The trial will be launched next month with 5 electric light buses and 11 liquefied petroleum gas (LPG) light buses. The 16 alternative-fuelled buses will be operated in 8 fleets under the management of experienced light bus operators to test their performance under real-life commercial light bus operations. This will allow representative operational data to be gathered. The trial will last for 6 months.

13. A monitoring committee is being set up to review the progress of the trial and vet the gathered data. Its members will be drawn from the preparatory committee plus fleet managers and representatives from the participating vehicle suppliers.

14. In order to allow the outcome of the trial to be acted on promptly, vehicle manufacturers will be kept informed of progress so that preparation for the provision of new vehicles can be made. Planning has also been undertaken to ensure that additional LPG refilling capacity to be provided to meet any demand from public light buses within 2002.

Particulate Traps

15. Trials of particulate traps for light diesel vehicles and of systems for cleaning the traps have been completed. An information paper was circulated to Members on 5 May 2000. At its meeting on 12 May 2000, the Finance Committee of the Legislative Council will consider the Administration's request for funds to begin implementation of the scheme.

Diesel Catalysts

16. In collaboration with the Hong Kong Polytechnic University, a trial of diesel catalysts has been launched. It will enable a specification for catalysts suitable for local large diesel vehicles to be established. The trial started in February 2000. It will last for 12 months since the variety of large diesel engines, operating conditions and fuel qualities encountered is extensive.

17. A monitoring committee comprising representatives from

relevant government departments, the transport trades and the Motor Traders Association is overseeing the trial.

18. Subject to the findings of the trial, we plan to assist owners of pre-Euro large diesel vehicles to retrofit them with suitable diesel catalysts in 2001.

Enforcement against Smoky Vehicles

19. The Secretary for Environment and Food has signed a resolution to increase the fixed penalty for smoky vehicle offences to $1,000. It is due to be debated at the Legislative Council meeting on 31 May 2000.

20. Since the introduction of the chassis dynamometer test for light diesel vehicles in September 1999, over 1,000 vehicles have had their licences recommended for cancellation after failing the test. It is intended to introduce chassis dynamometer tests for large diesel vehicles later this year.

21. From September 2000 the Transport Department will extend to all diesel vehicles attending their roadworthiness inspection a more thorough smoke test procedure.

Promoting Proper Maintenance and Eco-driving technique

22. Since August 1999, the Environmental Protection Department, in collaboration with the Vocational Training Council and the Hong Kong Productivity Council, has provided training sessions for 750 vehicle mechanics on proper engine repair to reduce smoke emissions. The Environmental Protection Department has also held eight discussion sessions and one workshop with the transport trades and vehicle mechanics to promote understanding of the dynamometer smoke test. A vehicle supplier has recently organised a seminar to help vehicle mechanics to maintain vehicles supplied by them.

23. In addition to its existing wide range of training programmes on vehicles, in March 2000 the Vocational Training Council started a new course on the diagnosis and repair of smoky diesel vehicles. This covers the advanced smoke test on a chassis dynamometer. The course can train up 2000 in-service mechanics a year.

24. In January 2000, a Working Group on Vehicle Maintenance Services was formed. It comprises representatives from the trade, government departments and professional bodies to consider ways to improve vehicle maintenance standards. Issues being studied include training of vehicle mechanics/technicians; making available technical data for vehicle maintenance; the feasibility of a licensing system for vehicle mechanics, etc. The Working Group is studying both long and short term improvement measures. It will put forward recommendations for the Administration's consideration by early next year.

25. To promote good driving and maintenance habits to reduce smoke emissions, since the end of 1999 the Environmental Protection Department has organised four seminars on eco-driving.

26. The Environmental Protection Department is preparing to launch a 3-month campaign next month to strengthen vehicle owners' awareness of their vehicles' need of proper maintenance. This will include the provision of free tests on a chassis dynamometer.

Emission Requirements for Newly registered Vehicles and Auto Diesel

27. The European Union will start to introduce the Euro III emission standards to newly registered motor vehicles in January 2001. To support this, the maximum permitted sulphur content in auto diesel will be reduced from 0.05% to 0.035%. A Euro III standard vehicle with the lower sulphur diesel will emit about 38% less particulates and 20% less hydrocarbon and nitrogen oxides than the equivalent Euro II model.

28. In keeping with the policy of adopting the most stringent practicable emission standards for all new vehicles, the Administration will introduce the Euro III standard here in parallel with its adoption in the European Union. An information paper on the details of this measure has been circulated to Members.

TASK FORCE

29. The Administration has set up a Task Force to oversee the implementation of the additional air pollution control initiatives and the 1999 Policy Address measures. It is chaired by the Secretary for Environment and Food. Other members are representatives of the Secretary for Transport, Secretary for the Treasury, Secretary for Planning Environment and Lands and Secretary for Economic services, the Director of Environmental Protection and the Commissioner for Transport. Other members from the Hong Kong Police and Customs and Excise Department will attend as required. The Task Force will also study other proposals for improvement of air quality.

30. A supernumary Deputy Secretary post has been created in the Environment and Food Bureau to assume responsibility for improving air quality.

Environment and Food Bureau
May 2000