

**For advice on  
15 January 2002**

**LEGISLATIVE COUNCIL  
PANELS ON ENVIRONMENTAL AFFAIRS AND TRANSPORT**

**Retrofitting Pre-Euro Diesel Heavy Vehicles With Catalysts**

**PURPOSE**

This paper briefs Members on the findings of the trial of retrofitting pre-Euro diesel heavy vehicles with catalysts and seeks Members' views on our proposed way forward.

**BACKGROUND**

2. Diesel vehicles are a major source of roadside air pollution in Hong Kong. One of our measures to reduce their emissions is to retrofit the older and more polluting diesel vehicles with emission reduction installations. With funding approval of the Finance Committee, we implemented a programme between September 2000 and October 2001 to provide financial assistance to owners of pre-Euro diesel light vehicles, for retrofitting their vehicles with particulate traps or catalysts. About 80% of the pre-Euro diesel light vehicles (or about 24 000 in number) participated in the programme. As we mentioned in Paper CB(1)1664/00-01(03) submitted to the Panels on Environmental Affairs and Transport on 4 July 2001, we plan to introduce legislation shortly to make the installation a mandatory requirement for this category of pre-Euro diesel vehicles. Once the proposed legislation is passed and becomes effective, owners of pre-Euro diesel light vehicles will be liable to cancellation or non-renewal of their vehicles' licences, if their vehicles are found not installed with approved particulate traps or catalysts.

3. Our plan is to extend the retrofit programme to pre-Euro diesel

heavy vehicles.

## **The Trial**

4. Pre-Euro diesel heavy vehicles are mainly goods vehicles and buses of more than 4 tonnes in weight registered before 1 April 1995. At present, there are about 45 000 such vehicles excluding franchised buses. Franchised bus companies have already taken the initiative to retrofit their pre-Euro buses with catalysts. So far, about 90% of such buses have been retrofitted. The remaining ones will be replaced with Euro III buses by end 2002.

5. EPD has carried out a trial to retrofit pre-Euro diesel heavy vehicles with catalysts. A Monitoring Committee also comprising representatives of the transport trades (including the Motors Traders Association), academics and other relevant government departments has been set up to monitor the trial. 59 pre-Euro diesel heavy vehicles including government vehicles and private vehicles have taken part in the trial. The performance of different catalysts was checked regularly. In addition, two questionnaire surveys have been conducted to gauge the views of the drivers of the vehicles participating in the trial such as their views on the impact of the catalysts on smoke emission, fuel consumption and lubrication oil consumption of the vehicles.

6. The trial has found that the catalysts are effective in reducing the emissions of particulates, carbon monoxide, hydrocarbons and smoke of pre-Euro diesel heavy vehicles. The key findings of the trial are as follows -

- (a) the catalysts can effectively reduce the emission of particulates, a major pollutant in our air, by more than 35%;
- (b) the catalysts work best when the vehicles are going uphill, i.e. when they emit the largest amount of exhaust. When the vehicle is heavily loaded, the catalyst can reduce smoke by about 40%;
- (c) the effectiveness of the catalysts in reducing carbon monoxide and hydrocarbons is comparable to and sometimes better than

their effectiveness in reducing particulates and smoke;

- (d) the catalysts have negligible effects on the performance of vehicle engines such as engine power and fuel consumption; and
- (e) suitable catalysts are available in the market for use on different vehicles including those that need to travel into the Mainland and use motor diesel that has a higher sulphur content than motor diesel in Hong Kong.

7. However, while the catalysts are effective in reducing the particulate, carbon monoxide and hydrocarbon emissions of all pre-Euro diesel heavy vehicles, the trial has revealed that vehicles which need to keep their engines running while stationary to support their on-board ancillary equipment (such as crane lorries, concrete mixer trucks, and signal light vehicles) will emit white smoke occasionally after a catalyst has been installed on them. Different catalysts have been tried with the attempt to resolve the problem but so far no suitable catalyst that will not cause this problem of white smoke has been found. We will continue to explore how this problem can be resolved. Among the 45 000 pre-Euro diesel heavy vehicles, about 4 000 belong to this category of long-idling vehicles.

## **RECOMMENDATION OF MONITORING COMMITTEE**

8. A catalyst when retrofitted on a pre-Euro diesel heavy vehicle can reduce its particulate emission by more than 35%. A catalyst can also reduce the smoke, carbon monoxide and hydrocarbon emission of a pre-Euro heavy vehicle by about 40%.

9. There is considerable support in the Monitoring Committee, including those from the representatives of the transport trades on the Committee, for retrofitting all pre-Euro diesel heavy vehicles with catalysts. The Monitoring Committee suggests that a programme to retrofit all pre-Euro diesel heavy vehicles except for the above-mentioned category of long-idling vehicles should be implemented in the first instance and that the search for suitable catalysts for the long-idling vehicles or a way to resolve the problem of white smoke should continue separately.

10. EPD has engaged an independent expert panel comprising one local and four international experts to draw up a technical specification laying down the functional requirements of the installation. In drawing up the specification, the expert panel has consulted the Monitoring Committee and major catalyst manufacturers worldwide. Since this is a functional specification, we will consider products other than in the form of a catalyst provided that they meet the specified functional requirements. The Monitoring Committee supports the expert panel's recommendations.

### **PROPOSED WAY FORWARD**

11. We propose to implement a programme to retrofit pre-Euro diesel heavy vehicles with catalysts or other installations. The installations would be completely funded by the Administration. We plan to make the installation mandatory once the retrofitting programme is completed. We intend to seek approval from the Finance Committee in the coming months for funding to retrofit about 41 000 pre-Euro diesel heavy vehicles (less the 4 000 long-idling vehicles which will be left out of the retrofit programme for the time being pending identification of an installation or method to resolve the white smoke problem) with catalysts or other installations. The total cost of the programme is estimated to be about \$600 million. Subject to Finance Committee's approval, we plan to invite tenders in the coming months, award the contracts by around mid-2002, start the retrofit programme shortly after summer this year and complete it by mid-2004.

### **ADVICE SOUGHT**

12. Members are requested to advise on our proposed way forward as set out in paragraph 11 above.

Environment and Food Bureau  
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