

ITEM FOR FINANCE COMMITTEE

HEAD 44 – ENVIRONMENTAL PROTECTION DEPARTMENT

Subhead 700 General non-recurrent

New Item “One-off subsidy to assist vehicle owners to replace the catalytic converters and oxygen sensors of their petrol and liquefied petroleum gas taxis and light buses”

Members are invited to approve the creation of a new commitment of \$150 million for providing a one-off subsidy to assist vehicle owners to replace the catalytic converters and oxygen sensors of their taxis and light buses that are fuelled by petrol or liquefied petroleum gas.

PROBLEM

To improve roadside air quality, we need to tackle the excessive emission problem of poorly maintained petrol and liquefied petroleum gas (LPG) vehicles.

PROPOSAL

2. The Director of Environmental Protection, with the support of the Secretary for the Environment, proposes to create a new commitment of \$150 million for providing a one-off subsidy to assist vehicle owners to replace the catalytic converters and oxygen sensors of their taxis and light buses fuelled by petrol or LPG.

3. Subject to funding approval by this Committee, we plan to tender for the supply of replacement parts and services in around mid 2012 for starting a six-month replacement programme before the end of 2012. After completion of the replacement programme, we will launch a strengthened emission control programme including the use of roadside remote sensing equipment and dynamometer emission testing for petrol and LPG vehicles in mid 2013 to bring early relief to roadside air pollution.

JUSTIFICATION

Roadside Air Pollution

4. Petrol and LPG vehicles rely on their catalytic converters to reduce emissions, which will be worn out over use and need to be replaced from time to time. Owing to much lower mileage, the catalytic converters of petrol vehicles such as private cars can likely last for eight or more years. But in the case of petrol and LPG taxis and light buses, in general the replacement needs to be made around every 18 months. If the worn-out catalytic converters are not replaced, the emissions of these vehicles (including nitrogen oxides, carbon monoxide and Volatile Organic Compounds) will increase by at least ten times. Unlike smoke from diesel vehicles, the emissions of petrol and LPG vehicles are invisible and can only be detected using roadside remote sensing equipment for their detection.

5. Emissions from petrol and LPG vehicles, especially taxis and light buses, account for over 40% of vehicular nitrogen dioxide (NO₂) emissions at busy traffic corridors. It is estimated that the catalytic converters of some 80% and 45% of road running petrol and LPG taxis and light buses respectively have been worn out. Their excessive emissions, particularly NO₂ emissions, are a major cause of the increasing number of days with Air Pollution Index (API) exceeding 100 in recent years¹.

6. Replacing the aged catalytic converters of petrol and LPG vehicles can reduce their emissions by 90%. The emission improvement could be accompanied by a fuel consumption reduction (which could be about 15% in the case of LPG taxis) and better driving performance. To improve roadside air quality, we need to tackle the excessive emission problem of poorly maintained petrol and LPG vehicles while taking forward other roadside air quality improvement measures. We therefore propose to embark on a strengthened emission control programme for petrol and LPG vehicles involving the use of roadside remote sensing equipment and dynamometers for emission testing.

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¹ The increase in NO₂ levels at the roadside has led to a fourfold increase in the number of days with API exceeding 100 from 43 in 2005 to 172 in 2011.

The Strengthened Emission Control Measures

7. Specifically, the proposed strengthened emission control measures have the following key features –

- (a) Upon completion of the replacement programme as set out in paragraph 3 above, we will deploy roadside remote sensing equipment in mid 2013 to screen out in-use petrol and LPG vehicles that emit excessively, and require their owners to rectify the excessive emission problem. Our plan is to deploy a total of five remote sensing teams to different locations in the territory for the screening. In line with the existing Smoky Vehicle Control Programme², we will require those vehicles screened as emitting excessively to pass an advanced emission test done with the aid of a chassis dynamometer at a designated vehicle emission testing centre within a prescribed period for ascertaining the rectification of the excessive emission problem. Failure to comply with the requirement will lead to cancellation of vehicle licence.
- (b) It is necessary to amend the relevant legislation so as to align the standards in the roadworthiness examination with the emission limits of the proposed strengthened emission control measures. We also plan to make preparations for the installation and operation of dynamometers at the vehicle examination centres for testing vehicle emission during annual roadworthiness examinations.

The One-off Subsidised Replacement Programme

8. To help the owners of petrol and LPG taxis and light buses, which tend to run on high mileage and need more frequent replacement of the catalytic converters than private cars, to adapt to the strengthened emission control measures described in paragraph 7 above during the initial period, we propose to provide a one-off subsidy to assist them to replace the catalytic converters and oxygen sensors of their vehicles.

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² The Smoky Vehicle Control Programme operates based on smoky vehicle reports provided by accredited spotters who are trained and tested to visually identify vehicles that emit smoke level over the legal limit of 50 Hartridge Smoke units when they are running on road. We will issue Emission Testing Notices to the owners concerned requiring their vehicles to pass an advanced smoke test (done with the aid of a chassis dynamometer) at a designated vehicle emission testing centre within 12 working days. Failure to comply with the requirement will lead to vehicle licence cancellation by the Commissioner for Transport.

9. While the taxis and light buses running on the road are now predominantly fuelled by LPG, there are five petrol taxis and one petrol light bus as at 31 December 2011. Like their LPG counterparts, petrol taxis and light buses also tend to run on high mileage and require frequent replacement of catalytic converters. For consistency, we propose to include them in the replacement programme as well. The total numbers of taxis and light buses eligible for the one-off subsidy are about 18 250 and 3 380 respectively. We do not propose to cover other types of petrol vehicles (mainly private cars) in the replacement programme because their low mileage will allow a much longer replacement cycle, usually eight years or more, for their catalytic converters.

10. The replacement will include oxygen sensors because they are essential components to support the operation of catalytic converters. After completion of the one-off subsidised replacement programme, we will, as mentioned in paragraph 7(a) above, start deploying remote sensing equipment for the screening of excessive emission by petrol and LPG vehicles on the road. Any future costs for subsequent replacement of catalytic converters and oxygen sensors will be borne by the vehicle owners.

Implementation Plan

11. Subject to the funding approval of this Committee, we intend to take forward the proposed subsidised replacement of the catalytic converters and oxygen sensors of petrol and LPG taxis and light buses as follows –

- (a) We will start the six-month replacement programme before the end of 2012. Same as the diesel oxidation catalyst installation schemes in the past, the subsidy will be paid directly to the appointed catalytic converter/oxygen sensors suppliers and the replacement work contractors instead of vehicle owners to ensure that the allocated resources would be used properly for their intended purposes.
- (b) We aim to award more than one contract for the supply of replacement catalytic converters and oxygen sensors to promote competition; and to ensure a good geographical coverage of replacement services so as to make the replacement more convenient for vehicle owners.

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- (c) Regarding the replacement work, each workshop appointed by us should have a mechanic, who has been registered under the Gas Safety Ordinance (Cap. 51) as Competent Person Class 6 for repairing LPG vehicles and has undertaken a training programme provided by us jointly with Vocational Training Council under the replacement contract. The training will also be offered to other vehicle mechanics to help them adapt to the maintenance skill required by the proposed strengthened emission control measures.
- (d) We will prescribe suitable warranty terms in the contracts for the supply of catalytic converters and oxygen sensors as well as the replacement service. Should vehicle owners identify problems with these replacement parts or workmanship, the responsible suppliers or contractors will be required to investigate these warranty claims.

FINANCIAL IMPLICATIONS

Non-recurrent Cost

Encl.

12. There are about 21 630 vehicles eligible for the one-off subsidy, the majority of which belong to four models of taxi and two models of light bus. A breakdown of these vehicles by Euro standard as at 31 December 2011 is at Enclosure. We estimate that the average cost of replacing catalytic converter and oxygen sensor (including the costs of the replacement parts and services) for a vehicle is about \$6,060. The replacement costs for around 21 630 eligible vehicles thus amount to about \$131 million. On top of the replacement cost, around \$2 million is required for arranging free training for mechanics and carrying out quality control work on the replacement parts. We also propose to reserve \$17 million as contingency to cater for fluctuation in precious metal³ prices and currency exchange rates, and changes in the make-up of the taxi and light bus fleet in the run up to the commencement of the replacement scheme (e.g. increase in the number of newer taxis whose catalytic converters are more expensive, increase in number of eligible light buses, etc.). The total cost required for the proposal is thus estimated to be \$150 million.

13. The actual cashflow requirement will depend on the level of participation of eligible vehicle owners because the replacement will be undertaken on a voluntary basis. For planning and budgetary purpose, the estimated cashflow is as follows –

/Financial

³ Precious metals such as platinum, rhodium, palladium etc. are essential materials for manufacture of catalytic converters.

Financial year	(\$ million)
2012 – 13	75
2013 – 14	<u>75</u>
Total	150

Recurrent Cost

14. The proposal has no additional recurrent financial implications. The Environmental Protection Department will oversee the replacement programme with existing staff resources.

PUBLIC CONSULTATION

15. We briefed the Panel on Environmental Affairs (the Panel) on the proposal on 28 November 2011 and completed a two-month stakeholder consultation on 15 January 2012. On 27 February 2012, we reported our consultation findings and recommendation to the Panel. The Panel agreed that we should take forward the proposed strengthened emission control measures outlined in paragraph 7 above and supported our proposal to seek funding approval from this Committee for the replacement programme for LPG taxis and light buses. Subsequently, we issued an information paper to the Panel on 22 March 2012 to provide the supplementary information requested by Panel Members and brief Members on our latest proposal to extend the replacement programme to cover petrol taxis and light buses.

BACKGROUND

16. To improve roadside air quality, we have been pursuing a combination of measures as follows –

- (a) introduce clean alternatives to diesel vehicles where practicable;
- (b) adopt the most stringent vehicle emission and fuel standards where practicable;
- (c) provide one-off grant to encourage commercial vehicle owners to replace their vehicles with new ones complying with the prevailing emission requirements;

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- (d) provide tax incentives to encourage the use of environment-friendly vehicles;
- (e) mandate pre-Euro diesel vehicles to be equipped with emission reduction device;
- (f) ensure proper maintenance of diesel vehicles by implementing Smoky Vehicle Control Programme, increased fine and joint Police roadside inspection against smoky vehicles;
- (g) encourage franchised bus companies to retrofit suitable emission reduction devices to their bus fleets so as to reduce emissions;
- (h) conduct a trial to retrofit Euro II and Euro III franchised buses with selective catalytic reduction devices to reduce nitrogen oxides emissions;
- (i) encourage the franchised bus companies to deploy more environment-friendly buses to serve the busy corridors;
- (j) plan to implement pilot low emission zones for franchised buses along the busy corridors in Causeway Bay, Central and Monk Kok; and
- (k) fund the full cost of procuring six hybrid buses to be used by the franchised bus companies for trial along busy corridors.

**Breakdown of Liquefied Petroleum Gas (LPG) and Petrol
Taxis and Light Buses by Euro standards
(as at 31 Dec 2011)**

Vehicle Class	Make	Euro Standard	Vehicle Number
LPG Taxi	Toyota	EURO II	6 500
		EURO III	8 300
		EURO IV	2 400
		EURO V	960
	Nissan	EURO III	85
Petrol Taxi	Toyota	EURO IV	5
Taxi sub-total			18 250
LPG Light Bus	Toyota	EURO III	3 130
		EURO IV	250
Petrol Light Bus	Toyota	EURO II	1
Light Bus sub-total			3 381
Total			21 631
