

**For discussion on
27 February 2012**

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS**

**A Proposal to Control Excessive Emissions of
Petrol and Liquefied Petroleum Gas Vehicles**

PURPOSE

Regulating petrol and liquefied petroleum gas (LPG) vehicles with excessive emissions can effectively improve roadside air quality. This paper briefs Members about the findings of our consultation on the proposal to control excessive emissions of petrol and LPG vehicles and to provide a one-off subsidy for vehicle owners to replace the catalytic converters and associated components (namely oxygen sensors) of their LPG taxis and light buses. It also seeks Members' views on our proposed implementation arrangements.

BACKGROUND

2. 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. If the worn-out catalytic converters are not replaced, the emissions of these vehicles (including nitrogen oxides, carbon monoxide and Volatile Organic Compounds (VOCs)) will increase by at least ten times. In the case of LPG taxis and light buses, in general the replacement needs to be made around every 18 months. Owing to much lower mileage, the catalytic converters of petrol vehicles, mainly private cars, can likely last for eight or more years. Unlike smoke from diesel vehicles, the emissions of petrol and LPG vehicles are invisible and will require the use of roadside remote sensing equipment for their detection.

3. Emissions from petrol and LPG vehicles, especially LPG taxis and light buses, account for over 40% of vehicular nitrogen dioxide emissions at busy traffic corridors. It is estimated that the catalytic converters of some 80% and 45% of road running LPG taxis and light buses respectively have

been worn out. To further improve roadside air quality, measures need to be taken to tackle the poor maintenance problem of petrol and LPG vehicles that lead to excessive emissions. Against this background, we sought Members' views on a proposal to control excessive emissions of petrol and LPG vehicles using remote sensing equipment and advanced emission tests, and to provide a one-off subsidy for vehicle owners to replace the catalytic converters and associated components of their LPG taxis and light buses on 28 November 2011 (LC Paper No. CB(1)353/11-12(01)). The two-month stakeholder consultation was ended on 15 January 2012.

FINDINGS OF THE CONSULTATION WITH STAKEHOLDERS

4. We consulted this Panel, the Advisory Council on the Environment (ACE), the Hong Kong Automobile Association, the taxi trade, the public light bus trade, the vehicle maintenance and repair service trade, the relevant professional bodies, academics and other relevant parties about the proposal. The stakeholders (other than statutory bodies) that we have approached for consultation are listed at the Annex. We also collected views via the Public Affairs Forum.

5. Overall, stakeholders generally recognise the need to control the excessive emissions of petrol and LPG vehicles for better roadside air quality and support the one-off subsidy scheme for vehicle owners to replace the catalytic converters and associated components of their LPG taxis and light buses. We have received the following key comments/suggestions –

Controlling Excessive Emissions

- (a) ***Emission Standards:*** Some consultees consider the proposed emission standards (i.e. setting the emission limits at two times the relevant vehicle design standards) too lenient whereas the transport trades are worried about the limits being so stringent that the catalytic converters need to be frequently replaced.
- (b) ***Transitional Period:*** Some taxi trade representatives have asked for a transitional period of 24 months after the Government has replaced the catalytic converters, during which LPG taxis found to be emitting excessively will be exempted from the proposed emission test conducted at a designated vehicle emission testing centre for ascertaining the rectification of the excessive emission problem. They consider the transitional period necessary because taxi owners

will need time for repairing their taxis, many of which are already over ten years old. In addition, they have suggested an immunity period of six months for LPG taxis that have passed emission tests at designated vehicle emission testing centres such that no action will be taken against them even if they are caught emitting excessively so as to reduce impacts on taxi operators.

- (c) ***Catalytic Converters not Readily Available on the Market:*** Some taxi and light bus vehicle owners have experienced long delivery time for replacement catalytic converters for their LPG vehicles. The limited supply could also lead to a higher price for these converters. They would like the Government to help improve the situation.
- (d) ***Dissemination of Vehicle Repair Information to Vehicle Owners and the Vehicle Repair Trade:*** Recognising the additional benefits of fixing the excessive emission problem such as enhanced vehicle reliability and improved fuel economy, some taxi trade representatives suggest that we provide repair guidelines for the reference of taxi owners and the vehicle mechanics. Some in the light bus trade also consider it useful if we develop similar repair guidelines for them.
- (e) ***Vehicle Licence Cancellation being too Harsh a Penalty:*** Some taxi and light bus trade representatives consider vehicle licence cancellation too harsh a penalty for their vehicles failing the emission test.
- (f) ***Alternative Control Arrangement:*** There is a suggestion that the roadworthiness examination of the Transport Department (TD) for licence renewal be upgraded in lieu of the deployment of remote sensing equipment to catch those vehicles that emit excessively during its operation on the road.

The One-off Subsidy

- (g) ***Need for Subsidy:*** While the taxi and light bus trades welcome the Government's one-off subsidy to replace the catalytic converters and associated components, some consultees see it unnecessary as replacing these worn-out engine parts is the obligation of vehicle owners.

- (h) ***Scope and Quality of the Engine Parts to be Replaced:*** There is a suggestion from the taxi trade that the scope of the subsidy should cover not only the replacement of catalytic converters and the oxygen sensors of LPG taxis but also that of mixers, vaporizers and exhaust recirculation valves. It is also suggested that the relevant contractors should provide suitable warranty on workmanship and the quality of the replacement parts.
- (i) ***Vehicle Repair Workshops for the Subsidised Replacement:*** In consideration of their normal practices, the taxi and light bus trades would like to see medium or small-sized vehicle repair workshops participate in the subsidised replacement programme. They also ask for a reasonable geographical distribution of the workshops to minimise travelling for the replacement.
- (j) ***The Duration of the Replacement Period:*** Some taxi and light bus trade representatives requested that the replacement be made over 12 months or even longer to tie in with their annual examination schedule. However, some consultees hold an opposing view that the replacement needs to be undertaken speedily to bring early relief to roadside air pollution.

6. We have carefully considered the above comments/suggestions and have the following responses –

- (a) ***Emission Standards:*** The proposed emission standards (i.e. setting the emission limits at two times of the relevant vehicle design levels) are comparable with those adopted in other environmentally advanced cities such as New York. They have also been endorsed by a Technical Review Panel comprising local experts from the academia, professional associations and the relevant Government departments. Moreover, according to our survey, the catalytic converters of LPG taxis and light buses can normally last for about 18 months without emitting excessively, depending on the maintenance practices of their owners. We thus consider the proposed emission standard reasonable and practicable.
- (b) ***Transition Period/ Catalytic Converters not Readily Available on the Market/Dissemination of Vehicle Repair Information to Vehicle Owners and the Vehicle Repair Trade:*** We need to take prompt actions to address the serious air pollution at the roadside and the substantial increase in emission due to poor vehicle maintenance. It

would defeat the objective of the proposal aiming to make earlier relief to roadside air pollution and delay the implementation of the measures if we allow for a transitional period of 24 months after the replacement of the catalytic converters, during which LPG taxis found to be emitting excessively will be spared the proposed emission test for ascertaining the rectification of the excessive emission problem. Nor would it help improve roadside air quality should we provide an immunity period during which taxis emitting excessively will need no remedial actions. Such arrangement is unreasonable.

To help LPG taxi owners to repair timely the excessive emission problem of their vehicles, we are now drafting a set of maintenance guidelines for the reference of LPG taxi owners and the vehicle repair trade, and will liaise with the Vocational Training Council for organising the relevant training courses for vehicle mechanics. Our target is to have such courses available to the trade in the second half of 2012. Similar efforts will also be made for LPG light buses. In the case of petrol vehicles, whose engines are usually in much better shape because of low mileage, we will also organize workshops for petrol vehicle mechanics to help them understand the new emission test requirement prior to the proposed deployment of roadside remote sensors to catch those petrol and LPG vehicles emitting excessively.

The proposed emission control scheme and subsidised replacement programme have already aroused the interest of catalytic converter suppliers on the local market. Nevertheless, after introduction of the proposed control scheme, we will allow extra time needed for the delivery of the replacement parts as we have been so doing under the Smoky Vehicle Control Programme.

- (c) ***Vehicle Licence Cancellation:*** We will not cancel the licence of a vehicle that has been found to be emitting excessively unless its owner has not fixed the excessive emission problem within a prescribed period¹. The same approach has been adopted in the Smoky Vehicle Control Programme. According to our experience, very few vehicles get their vehicle licences cancelled because most vehicle owners will make effort to fix the emission problem of their vehicles within the prescribed period.

¹ which is 12 working days plus any extension that we allow on account of justifiable considerations such as extra time for the delivery of replacement parts

- (d) ***Alternative Control Arrangement:*** Monitoring the emissions of petrol and LPG vehicles while they are in operation on the road is a direct and effective mean to minimize vehicle emissions. While TD will make preparation to upgrade the emission test in its roadworthiness examination for the testing of nitrogen oxides emissions, the two measures can complement each other and bring about effectiveness to improve roadside air quality.

The One-off Subsidy

- (e) ***Need for Subsidy:*** It is indisputable that vehicle maintenance is the obligation of vehicle owners. The subsidy that the Government proposes to offer is one-off in nature. It aims to help the taxi and light bus trades, whose vehicles tend to run on high mileage and need more frequent replacement of the catalytic converters than private cars, to appreciate the need and merits of replacing their catalytic converters and oxygen sensors as required and adapt themselves to the more stringent emission control regime. Any future costs for subsequent replacement of catalytic converters and associated components would be borne by the vehicle owners.
- (f) ***Scope and Quality of the Engine Parts to be Replaced:*** Among the engine parts of LPG vehicles, catalytic converters and oxygen sensors are the key emission-related parts that require regular replacement. We therefore propose to provide a one-off subsidy to cover the replacement of these two parts of LPG taxis and light buses. As to those engine parts suggested by the taxi trade for inclusion in the subsidised replacement programme (i.e. mixer, vapourizer and exhaust recirculation valves), like other engines parts, they require regular cleaning and servicing and replacement is only needed should they become irreparable. However they are not the key emission related parts and we do not include them into our scope of replacement under the one-off subsidy.

Regarding the quality of replacement catalytic converters and oxygen sensors, we agree that their suppliers should provide warranty on their quality and the installation contractors on workmanship. Details of our proposed requirements are further explained in paragraph 7(h) and (i) below.

- (g) ***Vehicle Repair Workshops for the Subsidised Replacement:*** There will be an open tender to select workshops to undertake the

subsidised replacement of catalysts and oxygen sensors. In the tendering exercise, we will organise briefings on the tendering procedures to facilitate vehicle workshops of medium or small-sized to participate. When selecting the workshops, we will aim to provide for a reasonable geographical distribution of workshops to make the replacement convenient to LPG taxi and light bus owners.

- (h) ***Length of the Replacement Period:*** To bring early relief to roadside air pollution, our plan is to complete the replacement in six months, after which we will start the deployment of remote sensing equipment to catch those vehicles emitting excessively. We will ensure completion of the replacement programme within such a timeframe.

PROPOSED IMPLEMENTATION ARRANGEMENTS

7. Given the feedback of the consultation, we propose the following arrangements for taking forward the proposals –

Controlling the Excessive Emissions

- (a) We would deploy remote sensing equipment to screen petrol and LPG vehicles emitting excessively for repair as proposed in our consultation document immediately after completion of the replacement of the catalytic converters and oxygen sensors for LPG taxis and light buses. To pave way for introducing the proposed control, a Code of Practices under Part VIIIa of the Road Traffic Ordinance (Cap. 374) will be issued, which among others, will spell out the test protocol (including emission limits), technical specifications for the test equipment (including the chassis dynamometers) and required quality assurance procedures. The information will enable designated vehicle emission testing centres to start preparation for introducing the emission test, which is aimed to be completed at the second quarter of 2013.
- (b) We will draw up a set of maintenance guidelines for the reference of LPG taxi and light bus owners and the vehicle repair trade, and will liaise with the Vocational Training Council for offering the relevant free training courses to vehicle mechanics. Our target is to have such training courses available to the trade in the second half of 2012.

- (c) To tie in with the deployment of remote sensors, it is necessary to amend the legislations so as to align the standards in the roadworthiness examination with the emission limits spelt out in the Code of Practice. We will also 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 Subsidy

- (d) Subject to the agreement of this Panel, we will seek funding approval from the Finance Committee for providing a one-off subsidy for vehicle owners to replace the catalytic converters and oxygen sensors of their LPG taxis and light buses. The funding required for the replacement exercise is estimated to be \$150 million. Same as diesel oxidation catalyst installation schemes in the past, the subsidy will be paid directly to the appointed catalytic converter suppliers and the replacement work contractors instead of vehicle owners to guard against abuse.
- (e) Subject to the Finance Committee's funding approval, we will arrange two separate tenders for the supply of catalytic converters and oxygen sensors, and provision of replacement services to LPG taxi and light bus owners. Our plan is to award more than one contract for the supply of replacement catalytic converters and oxygen sensors to promote competition; and award a sufficient number of contractors with a good geographical coverage for the provision of replacement services so as to make the replacement more convenient for vehicle owners.
- (f) We will follow the practice in the installation contract of diesel oxidation catalysts for pre-Euro diesel vehicles by setting the subsidy level at the level of the lowest bid among the compliant tenders. Should vehicle owners choose a more expensive product/installation service, they will have to top up the difference.
- (g) 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 provided by us under the replacement contract.

- (h) Regarding warranty, we are in discussion with potential suppliers of catalytic converters and oxygen sensors on the duration of the warranty. Subject to the outcome of the discussion, we aim to prescribe 12-month warranty, which is double that of the usual warranty for replacement parts. Should vehicle owners or their mechanics suspect problems with these parts, the suppliers will be required to investigate these warranty claims.
- (i) As for workmanship problems, the replacement work contractors will be required to take remedial action for such problems within three months after the replacement is done.

TIMETABLE

8. We are working out details of the tender requirements. Our plan is to seek funding approval from the Finance Committee in this April. Subject to the funding approval, we aim to tender for the supply of catalytic converters and oxygen sensors as well as the replacement services as soon as possible with a view to achieving early replacement work to improve roadside air quality. Depending on the progress of the replacement, we aim to deploy roadside remote sensing equipment around mid 2013 to screen out those petrol and LPG vehicles emitting excessively for their owners to take repair actions.

ADVICE SOUGHT

9. We would like Members to advise on the proposed way forward as set out in paragraph 7.

Environmental Protection Department
February 2012

**List of Consultees
(Other than Statutory Bodies)**

Stakeholders whom we have invited to our consultation meetings

1. The Hong Kong Automobile Association, The Motor Trades Association of Hong Kong and Service Mangers Association
2. Universities and tertiary institutions
3. Taxi trade associations
4. Public light bus trade associations
5. Green minibuses trade associations
6. Vehicle maintenance and repair industries
7. Motoring instructor industries
8. School buses operators associations
9. Vehicle exhaust emissions testing industries
10. Relevant government departments and statutory organizations

Stackholders that we have written to them for their views

11. Social welfare associations
12. Public utility companies
13. Manufacturing industries
14. Motor rental industries
15. Transportation and logistics industries
16. The Hong Kong Institution of Engineers and Engineering Companies
17. Tourism industries
18. Property management companies