

Subcommittee on Improving Air Quality
Response to the Follow-up Actions
Arising from Discussion at the Meeting on 27 July 2010

Administration's response to follow-up actions arising from the discussion at the meeting on 4 January 2010

- (1) **To provide details of the five electric motor cycles currently registered in Hong Kong**

The five electric motorcycles that are currently registered and licensed in Hong Kong are of the same model. The details are as follows:

| | |
|---------------|------------------------------|
| Maximum Power | 0.58kW |
| Maximum Speed | 70km/h |
| Dimensions | 1850mm(L)x650mm(W)x1050mm(H) |
| Total Weight | 130 kg |

- (2) **To provide the consultation brief for the Air Pollution Index (API) Review Study and information on the membership of the study team and the institutions involved, the expected timeframe for completion of the review as well as the resources allocated for the review. To also provide an undertaking that the full unedited report of the study team will be provided to the Subcommittee and uploaded onto the Government website for public reference.**

Please refer to **Annex A** for the requested information about the API Review Study. Upon completion of the study, we would provide the full study report to the Subcommittee and upload it onto the Government website for public reference.

Review of Air Quality Objectives – Proposed air quality improvement measures

(3) To advise the increase in road length and number of vehicles, including private, public and franchised vehicles, following the rapid expansion of the rail network over the past 10 years.

(i) The total public road length is as follows :

| Year | Total Public Road Length (km) |
|-------------|--------------------------------------|
| 2000 | 1904 |
| 2009 | 2050 |

(ii) The number of vehicles including private, public and franchised vehicles in the past ten years is given in the tables in **Annex B**.

(4) To consider making the use of photovoltaic panels as a mandatory requirement for new buildings to promote the use of renewable energy.

The Government is committed to promoting and supporting the development of renewable energy (RE) in Hong Kong. We have implemented a number of measures to encourage the public to adopt RE installations at their own buildings.

The Legislative Council passed the Revenue Bill 2008 on 26 June 2008 to implement some proposed measures in the 2008 - 09 Budget. These measures include allowing a 100% profits tax deduction for capital expenditure on environment-friendly machinery and equipment in the year of purchase and to shorten the depreciation period for environment-friendly installations mainly ancillary to buildings from the usual 25 years to 5 years. The measures provide economic incentive to encourage environment-friendly installations, which mainly includes RE installations. On the other hand, EMSD provides information on

grid connection of RE installations for public reference.

The above measures encourage citizens to adopt RE installations at their buildings. The public can decide whether to adopt such installations depending on individual situation and considerations.

(5) To map out a future street lighting system based on the use of solar energy, wind energy or light emitting diode.

To help improving Hong Kong's air quality, various energy saving schemes for public lighting have been carried out by Highways Department (HyD) in the past. HyD has also explored the use of new technologies and tried feasible energy saving measures in order to conserve energy for a better environment.

At present, HyD has implemented some trial schemes on light emitting diode (LED) lights and other alternative white light sources such as ceramic metal halide lamps (CDMT) to assess their performance. In general, the efficacy, lumen output and power rating of LED light are lower than those of the conventional high pressure sodium (SON) lamp. The initial trial scheme of LED lights is therefore limited to narrower streets with low traffic flow and pedestrian footbridges/pedestrian subways and the performance so far is acceptable. However, the current costs of certified LED street lights (about \$9,000 to \$15,000 each for 60W to 150W lantern) with better performance are about 9 -12 times higher than those of the conventional SON lights while the costs of LED light tubes (about \$600 each) are about 10 times higher than those of the conventional fluorescent light tubes. For street lighting application, HyD has also implemented trial schemes on CDMT lights which current cost is in the order of that of the conventional SON light, so as to compare their performance and payback period with LED lights.

To further evaluate the performance, HyD has implemented a larger scale of trial scheme to install 200 LED light tubes at pedestrian footbridges/pedestrian subways, 100 LED street lights

and 600 CDMT lights at various locations including roads, footpaths and rear lanes in 2010/2011. The technical performance of the installed LED and CDMT lights will be closely monitored.

HyD had also installed some solar-powered or photo voltaic (PV) street lights in remote village areas for trial. The current technology could only allow lower wattage lamp (e.g. 15W compact fluorescent lamp) rather than our conventional road lights (e.g. 70W SON lamp) being adopted in the trial. It is found that the average solar energy density in Hong Kong, being about 4.0 kWh/sq. m. daily, is insufficient for a reasonable sized PV system to supply to road light with medium to high lamp wattage (e.g. 70W, 100W, 150W or 250W which are the majority of street lights) independently without grid connection. Much higher capital cost and shading by many of the tall buildings in built up areas are other constraints. Hence, solar-powered street lights may be considered to be installed only at remote open areas where there is no stringent requirement on lighting.

The prospect for local application of wind-powered street light is also not promising as the wind in Hong Kong is not abundant enough. Besides, high capital cost and limited energy saving potential are the other limitations. As such, HyD does not have any plan to install solar-powered street light or wind-powered street light in built up areas in the coming years.

HyD is fully aware of the importance of energy saving in operating public lighting. HyD will continue to investigate various energy saving measures that are cost effective and without compromising road safety.

- (6) To advise the best practicable means available to enable power companies to increase the use of natural gas for electricity generation. To also advise if the supply of natural gas from the Mainland for local electricity generation is fully utilized and if not, the rationale behind the under-utilization.**

Both the Hongkong Electric Co., Ltd. and CLP Power Hong Kong Limited (CLP) have been fully utilizing the natural gas from their gas suppliers for electricity generation. The CLP, however, has not been able to maximize the utilization of its gas-fired generation units due to inadequate gas supply caused by the early depletion of the Yacheng Gas Field in Hainan Province, which is currently CLP's only source of gas supply. The best practicable means for the power company to fully utilize its gas-fired units is to seek from alternative sources extra supply of natural gas. In this connection, the Hong Kong Government signed in 2008 with the National Energy Administration a Memorandum of Understanding on Energy Co-operation, which will make available additional supply of natural gas to Hong Kong in the coming few years for power generation.

- (7) To provide a paper on the trial on retrofitting of franchised buses with selective catalytic reduction devices, inter alia, the coverage of the trial, membership of the task force, expected time for completion of the trial, and whether an independent third party will be engaged to oversee the trial.**

Please refer to **Annex C** for the requested paper.

- (8) To consider providing direct subsidy to ferry companies if it is the policy intent to mandate the use of ultra low sulphur diesel by local vessels.**

The trial of local ferries using ultra low sulphur diesel (ULSD) was completed in end-July 2010. EPD is reviewing the findings for mapping out the best way forward to encourage local ferries to use cleaner fuels.

Air Pollution Index Review Study

(I) Consultancy Brief

Objectives

1. To develop an API reporting system for use in Hong Kong with full justifications and implementation details.

Scope of Work

2. The scope of work for the study would consist of:
 - a) to develop an API reporting system in Hong Kong for accurate and timely communication of the health risks due to ambient air pollution to the public in light of the new AQOs proposed by the study on “*Review of the Air Quality Objectives and Development of a Long Term Air Quality Strategy for Hong Kong – Feasibility Study*” and the air quality guidelines of the WHO and with full justifications and after thorough trial runs using local air quality and health data; and
 - b) when the proposed new API reporting system is found to be acceptable, to develop the turn-key system to come with detailed instruction manuals, necessary software and a thorough staff training package; and to recommend a detailed plan for smooth transition from the existing to the new reporting system.

Detailed Specifications

3. The Contractor shall develop and evaluate the performance of a new API reporting system suitable for use in Hong Kong, under both normal and episodic conditions of air quality in light of the review of the air quality guidelines of the WHO and the proposed new AQOs. Emphasis should be placed on the accuracy and timeliness in

communicating the health risks to the public, by means of reviewing historical air quality data against the corresponding acute health data such as the number of daily hospital admissions and clinical visits. The existing health advice/descriptors of the API reporting system shall also be critically examined.

4. The Contractor shall review the pros and cons of the API reporting systems overseas, including but not limited to the mid 8-hour/mid 24-hour surrogate methods for calculating the Air Quality Index in the US, the Air Quality Health Index recently introduced in Toronto in Canada, the banded API system in the UK, and the Air Quality Index in Melbourne, Australia, and how feasible any of these systems to be introduced wholly, partly or in whatever combination for applications in Hong Kong with full justifications.
5. The Contractor shall, in developing and evaluating the new API reporting system, in addition to the issues mentioned above, address also the following technical issues:
 - a) whether the API should be calculated using a single pollutant or multiple pollutants
 - b) how the API should be coupled with the AQOs and what flexibility needs to be provided to cope with possible changes in the AQOs in future
 - c) whether a numerical or banded index system should be used and with what health advice/descriptors for accurate risk communications
 - d) how the absence of hourly standard for some air pollutants in the WHO air quality guidelines should be dealt with for calculating the hourly API; any proposed method so developed must be fully supported by thorough and systematic analysis using local air quality and health data
 - e) the need to reflect in the API reporting system the dosage or cumulative effect on the public of air pollutants in the past hours - to ensure proper reporting of API and dissemination of health advice

despite, say abrupt improvement in the ambient air quality in the current hour

6. On the instruction of the EPD, the Contractor shall prepare detailed instruction manuals for the new turn-key API reporting system together with necessary software for the use and retention of the EPD. Within three months from the formal acceptance of the new reporting system, the Contractor shall provide no more than FOUR training sessions for the relevant EPD staff and interested parties at a time and place endorsed by the EPD.
7. The Contractor shall prepare a detailed proposal on the implementation of the new API reporting system to maximize acceptance of the system by the general public and other stakeholders. The Contractor may draw on the experiences overseas, particularly on the public relations aspects for switching to using the new reporting system, e.g. whether parallel run of the old and new systems is advisable and for how long, when in the calendar year should the new system be introduced, what would be the expected reaction of the public, and what are the contingency measures to warrant smooth transition to the new system.

(II) Study Team

The study was awarded to a consultancy team led by Professor Wong Tze-wai of the Department of Community and Family Medicine of the Chinese University of Hong Kong. Other team members include experts and professionals from different local universities..

(III) Timeframe

The contract was awarded in April 2008. It is expected the study will be completed by the end of 2010.

(IV) Contract Value

The contract value of the study is HK\$ 1.245 million.

Annex B

| | Motor Cycles | | Private Cars | | Taxis | | Public Franchised Buses | | Public Non-franchised Buses | | Private Buses | |
|--------------|--------------------|----------------|--------------------|----------------|--------------------|----------------|-------------------------|----------------|-----------------------------|----------------|--------------------|----------------|
| Year / Month | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed |
| 2000 | 34 085 | 25 500 | 374 013 | 332 379 | 18 138 | 17 983 | 6 352 | 6 171 | 6 146 | 5 918 | 451 | 434 |
| 2009 | 52 933 | 37 604 | 429 754 | 393 812 | 18 138 | 18 128 | 5 799 | 5 786 | 7 066 | 6 968 | 504 | 492 |

| | Public Light Buses | | Private Light Buses | | Goods Vehicles | | Special Purpose Vehicles | | Government Vehicles | | Total | |
|--------------|--------------------|----------------|---------------------|----------------|--------------------|----------------|--------------------------|----------------|---------------------|----------------|--------------------|----------------|
| Year / Month | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed | Total Registration | Total Licensed |
| 2000 | 4 350 | 4 340 | 2 158 | 2 051 | 128 656 | 114 277 | 550 | 487 | 7 242 | 7 242 | 582 141 | 516 782 |
| 2009 | 4 350 | 4 347 | 2 020 | 1 992 | 114 003 | 107 402 | 1 427 | 1 263 | 6 276 | 6 276 | 642 270 | 584 070 |

Note : Figures as at end of the period.

For Information
August 2010

LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS
SUBCOMMITTEE ON IMPROVING AIR QUALITY

**Trial on Retrofitting of Franchised Buses
with Selective Catalytic Reduction Devices**

Purpose

As requested by Members at the meeting of the Subcommittee on Improving Air Quality on 27 July 2010, this paper provides information on the proposed trial of retrofitting Euro II and Euro III franchised buses with selective catalytic reduction devices (SCRs) to reduce their nitrogen oxides emissions.

Background

2. Respirable suspended particulates (RSP) and nitrogen oxides (NO_x) are the two key air pollutants emitted from franchised buses. To reduce the RSP emissions, franchised bus companies have retrofitted their pre-Euro II franchised buses with diesel oxidation catalysts, which can reduce their RSP emission by about 30%, and have been retrofitting their Euro II and III franchised buses with diesel particulate filters, which can reduce their RSP emissions by about 80%. As for NO_x, some places in Europe, such as London and Belgium, have successfully retrofitted some of their Euro II and Euro III single-deck buses with SCRs, which can reduce their NO_x emissions by about 60%.

Objective

3. The franchised buses in Hong Kong are mostly double-deckers and are under intense use here owing to hilly terrain and

hot summers that require the use of air conditioning. We would thus like to launch a trial jointly with the Kowloon Motor Bus Co. (1933) Ltd., Citybus Ltd., and New World First Bus Services Ltd., whose buses account for all the franchised buses at busy corridors in the urban area, to examine the technical feasibility and environmental benefits of retrofitting their Euro II and Euro III buses with SCRs. The trial, if successful, will pave the way for retrofitting such buses on a larger scale.

Task Force

4. We will take forward the trial via a task force, which will be led by EPD with representatives from the participating franchised bus companies, two overseas experts and one local expert, bus and bus engine manufacturers, SCR suppliers as well as the relevant Government departments. The task force will work out the technical arrangements of the trial (such as the coverage of the trial, number of buses to be tested, duration of the trial, etc.), monitor its progress and evaluate the trial findings.

5. The first meeting of the task force will be held in September this year. Subject to the views of the task force, we aim to proceed with the procurement of service for the installation of the SRC equipment in late 2010. Commencement of the trial may start around second quarter of 2011 and we plan to review the initial findings of the trial in six months' time. We will update Members the progress in due course.

Environmental Protection Department
August 2010