A. Introduction

The Audit Commission ("Audit") conducted a review of the Government's efforts in improving the air quality of Hong Kong with focus on the following areas:

- management of air quality objectives;
- administration of air pollution index; and
- performance reporting.

2. **Hon Abraham SHEK Lai-him** declared that he was currently an Independent Non-executive Director of the NWS Holdings Limited under which the New World First Bus Services Limited and Citybus Limited run franchised bus business.

3. **Mr WONG Kam-sing**, the **Secretary for the Environment**, made an opening statement at the public hearing on 7 December 2012. The full text of his statement is in ***Appendix 8***.

B. Management of air quality objectives

Revision of air quality objectives

4. Section 7 of the Air Pollution Control Ordinance (Cap. 311) ("APCO") provides that the Secretary for the Environment, shall, after consultation with the Advisory Council on the Environment, establish for each air control zone air quality objectives ("AQOs") or different objectives for different parts of a zone. AQOs serve as the air quality standards for the conservation and best use of air in the air control zone in the public interest. According to Appendix A to the Director of Audit's Report ("Audit Report"), the existing AQOs in Hong Kong set out the concentration targets for seven air pollutants, namely sulphur dioxide ("SO_2"), nitrogen dioxide ("NO_2"), respirable suspended particulates (expressed as "PM_{10}" which are particulate matters with a diameter of 10 micrometres (μm) or less), total suspended particulates ("TSP"), ozone ("O_3"), carbon monoxide ("CO") and lead.

5. Section 8 of the APCO further provides that the air pollution control authority ("the Authority"), who is now appointed to be the Director of Environmental Protection, shall aim to achieve the relevant AQOs as soon as is reasonably practicable and thereafter to maintain the quality so achieved.

6. The **Secretary for the Environment** said that, as the Authority under the APCO, the Director of Environmental Protection should implement appropriate measures to achieve the AQOs which were statutory objectives for protecting public health. To enhance protection of public health, the Government announced in January 2012 the adoption of the revised AQOs by referencing to the World Health Organization ("WHO")'s air quality guidelines ("AQGs") and Interim Targets. The Environment Bureau ("ENB") was at the final stage of drafting the relevant legislation and expected to table it in the Legislative Council ("LegCo") for scrutiny in early 2013.

7. The Committee noted that it had, in response to a previous review on the monitoring and control of air pollution conducted by Audit, recommended in its Report No. 29 of February 1998 that the Government should expedite action to revise the AQOs in Hong Kong and plan ahead to implement additional control measures necessitated by the revised AQOs. At that time, AQOs in Hong Kong were less stringent than the then health-based air quality standards of the WHO, the United States Environmental Protection Agency ("USEPA") and the United Kingdom ("UK").

8. The Committee noted from paragraph 2.17 of the Audit Report that subsequent to the 1997 Review conducted by a working group formed by the Environmental Protection Department ("EPD") and the 2007 Consultancy Review commissioned by the EPD to review the AQOs, the EPD still had not made timely revision to the existing AQOs, which were established in 1987. Given that AQOs were statutory objectives for protecting public health, the Committee asked why the Government had not taken the two opportunities to tighten the AQOs, in light of overseas and local research findings.

9. **Mr Andrew LAI Chi-wah**, the **Deputy Director of Environmental Protection**, and **Mr MOK Wai-chuen**, the **Assistant Director of Environmental Protection**, explained and **Ms Anissa WONG Sean-yee**, the **Director of Environmental Protection**, stated in her letter of 14 December 2012 (in ***Appendix 9***) that:

- Hong Kong established its AQOs in 1987 by referencing to the then national ambient air quality standards ("NAAQS") of the USEPA, which were the most stringent air quality standards amongst advanced countries at the time;

- in 1997, the USEPA proposed to introduce new standards for particulate matters with a diameter of 2.5 μm or less ("$PM_{2.5}$") and O_3. After putting forward the proposed $PM_{2.5}$ standards, the USEPA faced a number of lawsuits challenging the adequacy of the proposal. At that time, the EPD formed a Working Group on the Health Effects of Air Pollution ("the Working Group") to review the AQOs. The Working Group concluded in July 1999 that adopting more stringent objectives for SO_2, PM_{10}, NO_2 and O_3 would provide further protection of public health, and adopting an appropriate objective for $PM_{2.5}$ was potentially of greatest importance. Given that no numerical target values were provided by the Working Group for these pollutants, the EPD had to wait until the lawsuits in the United States of America ("USA") were settled in 2005;

- in 2006, the WHO published the AQGs which provided comprehensive advice on how AQOs should be tightened as well as numerical target values for various air pollutants. In mid-2007, the EPD commissioned the Consultancy Review with a view to revising the existing AQOs with reference to the WHO AQGs and practices of advanced countries, and developing a long-term air-quality management strategy as soon as possible. In July 2009, the Government consulted the public on a proposal to update the AQOs together with a package of 19 air-quality improvement measures proposed by the Consultant. On 17 January 2012, the Government announced the adoption of the revised AQOs together with a package of 22 air-quality improvement measures for achieving the revised AQOs. If approved by the LegCo, the revised AQOs would come into effect in 2014 ("the 2014 AQOs"); and

- to ensure Hong Kong would parallel international best practices in air-quality management, the ENB and the EPD would review the AQOs once every five years for achieving the AQG levels of the WHO in the longer term.

10. As revealed in paragraph 2.19 and Appendix G to the Audit Report, over the 13 years from 1997 to 2010, the USA, the UK and the European Union ("EU") had all tightened their air-quality standards and introduced new standards for their countries several times. Against this background, the Committee queried why the EPD had not adopted the practices of the USA, the UK and the EU to introduce new air quality standards for air pollutants individually but had waited for the outcome of a lawsuit in the USA, thereby sacrificing the health and well being of Hong Kong people.

11. The **Director of Environmental Protection** explained and stated in her letter of 14 December 2012 (in Appendix 9) that:

- after the settlement of the lawsuit in 2005 in the USA, the USEPA eventually promulgated the final $PM_{2.5}$ standards on 17 October 2006, keeping the rest of its standards in the NAAQS essentially unchanged;

- on the other hand, the WHO issued in 2006 the AQGs which recommended that governments needed to set their air quality standards having regard to their own particular circumstances and the specific approach to balancing risks to health, technological feasibility, economic considerations and other political and social factors; and

- in the 2007 Consultancy Review, the EPD had not only undertaken to review the existing AQOs but had also developed a long-term air-quality management strategy with a package of 19 air-quality improvement measures for the progressive achievement of the 2014 AQOs.

12. On the issue of tightening the AQOs, **Ms Christine LOH Kung-wai**, the **Under Secretary for the Environment**, said that both the Secretary for the Environment and she were unable to identify any documentary evidence as to why the tightening of the AQOs had not been accorded a sufficiently high priority in the Government's policies in the past years. She further said that with hindsight, the Government could have made reference to overseas practices to review and tighten the AQOs for individual air pollutants some time ago. Nevertheless, there was a shift in the priority setting of the Government's policies recently, and the Government would proactively improve air quality and carefully consider public health when formulating clean air policy.

Achievement of AQOs

13. As revealed in paragraph 2.13 of the Audit Report, although Hong Kong aspires to be Asia's world city, the air quality of Hong Kong in 2011 did not match that of three world cities, namely New York, London and Sydney. At the request of the Committee, the **Director of Environmental Protection** provided supplementary information on the air quality of Shanghai and Singapore in 2011 (in ***Appendix 10***) as follows:

	Hong Kong	Shanghai	Singapore	New York	London	Sydney
PM_{10}	48	80	27	19	24	15
NO_2	53	51	25	39	36	14

The Committee noted that the air quality of Hong Kong in 2011 did not match that of Singapore in terms of the concentration level of PM_{10} and NO_2, whilst Hong Kong performed better than Shanghai in terms of the concentration level of PM_{10}.

14. The Committee noted Audit's observation in paragraph 2.14 that the air quality of Hong Kong had not fully achieved the existing AQOs since their adoption in 1987. In particular, in 2011, the concentration levels of NO_2, PM_{10}, TSP as well as O_3 had exceeded the existing AQO limits as stated in Appendix F to the Audit Report. In view of the above, the Committee questioned whether the Secretary for the Environment and the Director of Environmental Protection had failed to discharge their statutory duty under sections 7 and 8 of APCO in that the AQOs had neither been revised nor been fully achieved since the adoption of the existing AQOs in 1987.

15. The **Director of Environmental Protection** replied that over the years, the ENB and the EPD had been implementing a wide range of initiatives, including those summarized in Appendix E to the Audit Report, to improve air quality in Hong Kong. These measures targeted at major pollution sources such as power plants, industrial and commercial activities, and vehicles. Noting that achievement of AQOs at roadside was important, the EPD had taken advantage of recent technology advances to put forward further emission control measures including retrofitting Euro II and Euro III franchised buses with selective catalytic reduction devices and strengthening the emission control of petrol and liquefied-petroleum gas ("LPG") vehicles by using remote sensing equipment and dynamometers for emission testing. The EPD was

also examining how to effectively phase out heavily polluting diesel commercial vehicles.

16. The **Secretary for the Environment** and the **Under Secretary for the Environment** said that:

- to successfully implement the air-quality improvement measures, the ENB/EPD would work closely with different Government bureaux/departments and relevant stakeholders to achieve the desired results;

- to strengthen the coordination of different Government departments, the Government had set up a new Policy Group under the Policy Committee with focus on sustainability, the environment and energy policies. Under the chairmanship of the Chief Secretary for Administration, the Policy Group would strengthen cross-bureaux and cross-departments co-operation in the formulation and implementation of air policies; and

- as the AQOs served as key references to the EPD in assessing whether the air-quality impact of designated projects was acceptable for approval under the Environmental Impact Assessment Ordinance (Cap. 499), the tightening of the AQOs would have significant impact on the projects in both public and private sectors. In this regard, the support of the Development Bureau, the Transport and Housing Bureau, the trade and the community would be of utmost importance.

17. The **Secretary for the Environment** further said that the Government projects for which Environmental Impact Assessment studies had not yet commenced would adopt the 2014 AQOs as the benchmark for conducting the air-quality impact assessment studies.

Benchmarking against the standards of the WHO AQGs

18. The Committee noted Audit's observation in paragraph 2.29 that the 2014 AQOs for SO_2, PM_{10}, $PM_{2.5}$ and O_3 were mostly based on the WHO Interim Targets which did not provide adequate protection of public health when compared with the WHO AQG levels. In particular, Table 1 in paragraph 2.29 of the Audit Report shows that the health risks for not achieving the WHO AQG level for SO_2, PM_{10}, $PM_{2.5}$ and O_3 include a higher risk of premature mortality, about 2.5% - 15% increase

in short-term or long-term mortality, effects on hospital emergency admissions for total respiratory and chronic obstructive pulmonary diseases, etc. The Committee also noted that the Interim Targets provided in the WHO AQGs served as milestones to facilitate a progressive approach to achieving the WHO AQGs.

19. According to paragraph 2.12 of the Audit Report, upon attainment of the 2014 AQOs in Hong Kong, about 4 200 unnecessary hospital admissions and 7 400 statistical life years would be saved each year (or an improved average life expectancy of around one month for the entire population).

20. Against the above background, the Committee enquired whether the ENB/EPD had any timetable for achieving the WHO AQGs.

21. The **Director of Environmental Protection** said and elaborated in her letter of 14 December 2012 (in Appendix 9) that:

- it was the long-term objective of the ENB/EPD to fully achieve the WHO AQGs. At present, no countries/cities had set their AQOs at the AQG levels or had been able to fully achieve the AQG levels. Hong Kong had already achieved the WHO AQG levels for lead and CO. The EPD was committed to implementing additional measures to further reduce local emissions;

- the ENB/EPD were also working with Guangdong Provincial Government to tackle regional air pollution in order to bring down the pollution levels. On 23 November 2012, the Government announced jointly with Guangdong Environmental Protection Department a new emission reduction plan for the Pearl River Delta ("PRD") Region, which set out air pollutant emission reduction targets for both Hong Kong and PRD Economic Zone up to 2020;

- the EPD's air-quality projection showed that, upon attainment of the new emission reduction targets, the WHO AQG levels for NO_2 and 10-minute measurement of SO_2 at the ambient level would be broadly achieved by 2020;

- as for other pollutant measurements, the revised AQOs would be broadly met by 2020;

- through the EPD's efforts on the local and regional fronts, it was anticipated that Hong Kong would progressively move towards the long-term goal of achieving the WHO AQGs as soon as possible; and

- as pledged in the ENB/EPD's proposal to adopt the revised AQOs, the ENB/EPD would review the progress on the achievement of the revised AQOs in the regular review at a frequency no less than once every five years.

22. As unsatisfactory air quality might cause detrimental health effects on members of the public, leading to an increased number of people contracting illnesses and hospital admissions, the Committee recommended that the Government should accord a higher priority to the policies and initiatives on the environment in the Chief Executive's 2013 Policy Address and the 2013-2014 Estimates, for better protection of public health.

Public expenditure on air-quality management

23. The Committee was of the strong view that government expenditure should be better spent on preventive measures to protect public health by improving air quality than on medical cost arising from curing health problems associated with air pollution. Considering the significant health risks induced by poor air quality, the Committee asked about the public expenditure on improving air quality in Hong Kong and how this compared with other world cities.

24. In response to the Committee's enquiry, the **Director of Environmental Protection** reported in her letter of 14 December 2012 (in Appendix 9) that:

- in the financial year of 2011-2012, the expenditure incurred by the EPD on air programme was about $566 million, accounting for about 23% of the total expenditure of the EPD and 0.03% of the Gross Domestic Product ("GDP") of 2011;

- apart from providing expenditure on air programmes, the Government had supported various air-quality improvement initiatives through the government revenue forgone and compliance by stakeholders concerned, such as:

(a) tax incentive for environment-friendly petrol private cars, i.e. $633 million in the financial year of 2011-2012;

(b) tax incentive for environment-friendly commercial vehicles, i.e. $154 million in the financial year of 2011-2012; and

(c) fuel duty foregone for supporting the use of Euro V diesel with virtually no sulphur content, i.e. $2,018 million in the financial year of 2011-2012;

- the public expenditure reflected only a fraction of the Government's efforts to clean up the air of Hong Kong. Most of the emission reduction efforts were made through the mandatory control programmes, e.g., the imposition of stringent emission caps on power sector, implementing various energy saving measures to reduce electricity demands, upgrading the emission limits on vehicles, tightening the fuel sulphur content of commercial/industrial diesel fuel, prohibition of the import and manufacture of commercial and consumers products with excessive volatile organic compound contents; and

- the EPD did not have the information on the public expenditure of other countries/economies on tackling air pollution as the percentage of their respective GDP for comparison. As the air pollution issues encountered by different countries and their control strategies were different, it was very difficult to make comparison with other countries/economies.

C. Administration of air pollution index

Air pollution index reporting system

25. Air pollution index ("API") is a simplified and generalized way for reporting air quality. Different countries have adopted different methodologies in compiling APIs. In June 1995, the EPD established the Hong Kong API reporting system. In 1999, the EPD commenced compiling hourly APIs for all monitoring stations. Under the system, the hourly concentration level of each of the five air pollutants (namely SO_2, NO_2, PM_{10}, CO and O_3) measured at each monitoring station is compared with the corresponding AQO for compiling the API for each pollutant, which ranges from 0 to 500. The highest API amongst the APIs of the five pollutants is taken and reported as the hourly API of that station.

26. In recognition of the high health risks associated with very high air pollution, i.e. an API exceeding 100, the EPD has set a performance target since 2006-2007 that the number of days with API not exceeding 100 in a year should be 365, i.e. the API should not exceed 100 on any day in a year.

27. The Committee referred to Figure 5 in paragraph 3.10 and Figure 6 in paragraph 3.11 of the Audit Report which revealed that the EPD had never achieved its performance target on API since setting the target in 2006-2007. The Committee was very concerned about the worsening air pollution, particularly at the roadside level, and asked about:

- the number of days with API exceeding 200 from 2007 to 2011; and

- the reason(s) for the increase in the number of days with API exceeding 100 in a year from 74 in 2007 to 175 in 2011 (i.e. a 136% increase).

28. The **Director of Environmental Protection** responded and elaborated in her letter of 20 December 2012 (in ***Appendix 11***) that:

- from 2007 to 2011, there were only three days in which API exceeded 200, details of which were set out in the following table:

Number of days with API exceeding 200 at any stations					
	2007	2008#	2009	2010*	2011
General	0	1	0	2	0
Roadside	0	0	0	2	0
Overall	0	1	0	2	0

\# The incident happened in July 2008 and was caused by regional photochemical smog with O_3 as the culprit pollutant

* The incident happened in March 2010 when Hong Kong was affected by a dust plume originated from Northern China

- from 2007 to 2011, the number of days with general API exceeding 100 in a year had been relatively stable, ranging from 19 to 22 days. However, during the same period, the number of days with roadside API exceeding 100 in a year increased from 68 to 172 due to an increase in NO_2 concentration. These NO_2 emissions mainly came from franchised

buses, LPG vehicles with worn-out catalytic converters, and the heavily polluting diesel commercial vehicles (i.e. pre-Euro ones). The rise in O_3 level in the PRD Region had also aggravated the conversion of nitric oxide emitted from vehicles into NO_2; and

- to tackle the roadside NO_2 problem, the Government had been taking forward the following measures:

  (a) launching of a three-year incentive scheme in 2007 to encourage the replacement of pre-Euro and Euro I diesel commercial vehicles with new ones and another three-year incentive scheme in 2010 for replacing Euro II diesel commercial vehicles with new ones;

  (b) conducting a trial of retrofitting Euro II and Euro III franchised buses with selective catalytic reduction devices for reducing nitrogen oxide emissions. If the trial was successful, the Government would fully fund the retrofit of the devices on these buses;

  (c) setting up low emission zones in heavy traffic areas in Causeway Bay, Central and Mongkok by increasing the use of low emission franchised buses;

  (d) making preparations to strengthen the emission control for petrol and LPG vehicles including the deployment of remote sensing equipment and dynamometers for testing of vehicles' emissions; and

  (e) collaborating with Guangdong to improve regional air quality in particular, O_3, which aggravates the formation of NO_2 at the roadside.

29. As revealed in paragraph 3.10 of the Audit Report, the API trend had worsened from 2007 to 2011. The Committee considered that the EPD needed to publish on its website reader-friendly information on any adverse trends in air quality so that the public could be adequately alerted on the worsening air quality.

30. In response to the Committee's concern, the **Under Secretary for the Environment** and the **Assistant Director of Environmental Protection** said that:

- the EPD's website provided an extensive amount of information on API performance or air-quality data over the years for reference by the public;

- the EPD would endeavor to provide on its website air-quality data and information on API performance in reader-friendly manner; and

- the EPD was committed to providing accurate, comprehensive and timely information and data on air quality for reference by the public.

31. According to paragraph 3.18 of the Audit Report, as of September 2012, when the roadside API of Central, Causeway Bay or Mong Kok exceeded 100, the EPD would inform the public of the district concerned and the recorded API, together with a precautionary advice that "persons with heart or respiratory illnesses are advised to avoid prolonged stay in areas with heavy traffic". However, there was a risk that members of the public might interpret the advice as air quality at roadside of all districts other than the named district was satisfactory. In this regard, the Committee asked:

- whether consideration would be given to improving the precautionary advice given to the public when roadside API exceeded 100; and

- whether consideration would be given to disseminating the API information and the precautionary advice through other effective means.

32. The **Assistant Director of Environmental Protection** reported that the EPD collected roadside air-quality data in places other than the three roadside AQMSs and found that the data from the three roadside AQMSs were representative of the roadside air quality of places with heavy vehicular and pedestrian traffic and poor air dispersion. Members of the public at roadside with heavy vehicular and pedestrian traffic and surrounded by tall buildings were advised to refer to the roadside APIs for reference. The **Director of Environmental Protection** said and stated in her letter of 20 December 2012 (in Appendix 11) that:

- the EPD had amended the precautionary advice for roadside API exceeding 100 since October 2012;

- the set of precautionary advice had been drafted taking account of the advice of medical professionals and should be sufficiently clear and specific for the public including the more vulnerable groups; and

- if the API was at very high or severe level, i.e. above 100, the precautionary advice would be disseminated through the following channels:

  (a) the EPD's website and other government webpage (e.g. GovHK webpage);

  (b) mobile applications, i.e., GovHK Notifications;

  (c) interactive voice recording system at 2827 8541;

  (d) hourly reports via Information Services Department to the media including televisions, radios and newspapers;

  (e) emails to Education Bureau and other government departments so that they could inform their respective stakeholders;

  (f) press release in case of widespread, prolonged and very high API incidents; and

  (g) API information was also provided at the display boards at the entrances of Mass Transit Railway stations; and

- the EPD would regularly review the effectiveness of the existing channels for disseminating API information and related precautionary advice to the public.

33. At the request of the Committee, the **Director of Environmental Protection** provided in her letter of 20 December 2012 (in Appendix 11) a copy of the set of precautionary advice issued for various levels of API.

Review of API reporting system

34. As reported in paragraph 3.20 of the Audit Report, APIs of other countries have taken account of the combined health impact of a number of pollutants, whilst the existing API in Hong Kong only reflects the concentration level and health

impact of the contributing pollutant. The Committee noted from paragraph 3.19 of the Audit Report that in April 2008, the EPD appointed a consultant to conduct a review of the API reporting system with a view to developing a new API reporting system. After a lapse of four years, the consultant submitted its final review report ("the API Review Report") to the EPD in June 2012.

35. At the request of the Committee, the EPD undertook to submit the API Review Report to the Panel on Environmental Affairs ("EA Panel") of the LegCo in December 2012. The EPD also undertook to consult the EA Panel in the second half of the 2012-2013 legislative session on its action plan to revamp the existing API reporting system, taking into account the findings and recommendations of the consultant.

36. The Committee further asked about the action plan of the EPD in the implementation of the new API reporting system.

37. **Mr PANG Sik-wing**, **Principal Environmental Protection Officer (Air Policy)**, and the **Under Secretary for the Environment** said that:

- the study team of the review of API reporting system had critically reviewed the latest overseas practices, including those adopted in the USA, UK, Australia and Canada. In particular, the study team had made reference to the Canadian Air Quality Health Index, and local health and air-quality data in coming up with the new API reporting system;

- the new API would report the public health risks associated with excessive exposure to air pollution, and give better and more relevant information to the public for better protection from potential adverse health effects arising from excessive exposure to air pollution; and

- the EPD planned to report the findings and recommendations of the API Review Report to the EA Panel in early 2013 and consult relevant stakeholders in parallel on the necessary preparatory work, such as the development of a system for computing and disseminating the new API information, development of guidelines for schools and key stakeholders in response to high pollution conditions as well as publicity of the new API reporting system.

38. Apart from a new API reporting system that could better communicate to the public the health risks associated with air pollution, the Committee held the view that the API information should accurately reflect measurements of air quality against specified standards. The Committee asked whether the Government had any plan to develop a health index with local reference for the purpose of measuring the quality of life in Hong Kong.

39. The **Under Secretary for the Environment** said that there was no such plan at this stage. She however concurred with the Committee that Hong Kong was in lack of relevant research findings relating to the health impact of local air quality when formulating air policies and air-quality management strategy.

Air-quality monitoring network

40. From 1983 to 1999, the EPD had established 14 air-quality monitoring stations ("AQMS") in various districts, including 11 general stations and three roadside stations. Each of the general stations has a normal coverage of 4 km. The Committee noted Audit's observation in paragraph 3.15 that the EPD completed its first overall network assessment in May 2011 and did not consider there was an immediate need for additional monitoring stations, despite the fact that some LegCo Members had repeatedly expressed their concerns about the adequacy of the monitoring network at different LegCo meetings from 2007 to 2012.

41. Against the above background, the Committee queried:

- the criteria upon which the need for establishing a new AQMS was assessed;
- whether the air-quality data analysis would be enhanced with increased number of AQMSs;
- whether the financial and staffing implications were impediments to the setting-up of additional AQMSs; and
- whether the EPD had any plan to set up new AQMSs, and if so, the considerations behind the choice of the site(s).

42. The **Assistant Director of Environmental Protection** explained that:

- the air-quality monitoring network gauged data on air quality for developing effective air-quality management strategy, as well as assessing compliance with the AQOs and health risks associated with poor air quality. It also collected data for working out the current and projected air quality. In line with the international practices, the EPD considered a number of factors, including the spatial distribution of the network, the coverage of different types of development area (e.g. urban area, new towns and rural area), local population, the distribution of vehicular traffic and sources of pollution, the capability in monitoring regional air pollution, topography, etc., when choosing the site of an AQMS;

- Hong Kong was a small and densely populated city with economic activities mainly in commercial and financial area. As such, vehicle emission was a key local source of air pollution and the levels of air pollution in different districts are mainly determined by their respective types and density of development. As the current air-quality monitoring network had an adequate spatial distribution of general AQMSs covering different land uses (commercial, residential, industrial and mixed) of the urban, new town and rural area, it was not necessary to set up a general AQMS in each district;

- all the existing three roadside AQMSs (i.e. located in Central, Causeway Bay and Mongkok) were installed in the busiest streets of urban areas with very high vehicular and pedestrian traffic, and surrounded by tall buildings. According to the EPD's evaluation, the existing three roadside AQMSs were adequate for collecting representative data of the roadside air quality in places with heavy vehicular and pedestrian traffic, and poor air dispersion. Hence, it was not necessary to increase the number of roadside AQMSs;

- to ensure that the network meets the monitoring objectives, the EPD would continue to review annually the adequacy of the network and the need for establishing new AQMSs, taking into account the most updated situation of the changes in land use, sources of pollution and population coverage, etc. The capital cost for setting up an AQMS was estimated to be $3 million and the annual recurrent cost was about $1.5 million to $2 million. The EPD considered the existing network adequate for collecting representative data of air quality for developing effective air-quality management strategy; and

- subsequent to the 2012 review of the air-quality monitoring network, the EPD concluded that new AQMSs should be set up in Tuen Mun and Tseung Kwan O. As a sludge incinerator would be set up in Tuen Mun, an AQMS was being built in the district to monitor the impact on the air quality. For Tseung Kwan O, an AQMS was considered justified, taking into consideration the rapid development and population growth in the district as well as the fact that it differed significantly from other districts in terms of air dispersion.

43. The Committee noted from paragraph 3.13 of the Audit Report that amongst the 18 administrative districts in Hong Kong, the EPD had not installed general air-quality monitoring stations in eight districts, namely Hong Kong Island Southern District, Wan Chai, Yau Tsim Mong, Kowloon City, Wong Tai Sin, Sai Kung, Tuen Mun, and New Territories North District. As a result, the EPD had not published any district-based APIs for these eight districts. As stated on the EPD's website, residents of the eight districts without district-based API were advised to refer to the air-quality information of other districts with similar development characteristics. However, there was no information about the relevant districts that should be referred to. The Committee asked whether consideration would be given to making arrangements to facilitate residents of these eight districts without general stations to gain access to the district-based API.

44. The **Under Secretary for the Environment** responded that meeting the objectives of monitoring air quality for developing effective air-quality management strategy and assessing compliance with the AQOs had been the main consideration of the EPD in its annual assessment or five-yearly overall assessment of the monitoring network. Nonetheless, the EPD would not rule out the possibility of taking into account the need for better communicating timely air-quality information to the public when it conducted the assessment of the monitoring network in future.

45. In response to the Committee's enquiry, the **Assistant Director of Environmental Protection** agreed to provide the district-based coverage of the general air-quality monitoring stations on the EPD's website to facilitate residents of the eight districts without general stations to refer to the relevant districts for district-based API. At the request of the Committee, the **Director of Environmental Protection** provided a copy of the information on the district-based coverage of the general stations shown on the EPD's website as follows:

Ambient Air Quality Monitoring Station		Characteristics of the Area Where the Station is Located	District(s) Represented by the Station
1.	Central/ Western	Urban: densely populated residential area with commercial developments	Central and Western, Wan Chai, Southern (depending on the location)
2.	Sham Shui Po	Urban: densely populated residential area with commercial developments	Sham Shui Po, Yau Tsim Mong, Kowloon City
3.	Eastern	Urban: densely populated residential area	Eastern, Southern (depending on the location)
4.	Kwun Tong	Urban: densely populated residential area with mixed commercial/industrial developments	Kwun Tong, Wong Tai Sin
5.	Kwai Chung	Urban: densely populated residential area with mixed commercial/industrial developments	Kwai Tsing
6.	Tsuen Wan	Urban: densely populated residential area with mixed commercial/industrial developments	Tsuen Wan
7.	Tai Po	New town: residential area	Tai Po, North (including Sheung Shui and Fanling)
8.	Sha Tin	New town: residential area	Shatin, Sai Kung (including Tseung Kwan O)
9.	Tung Chung	New town: residential area	Islands
10.	Yuen Long	New town: residential area	Yuen Long (including Tin Shui Wai, Tuen Mun)
11.	Tap Mun	Rural	

D. Performance reporting

46. The Committee considered that to meet the challenges arising from the 2014 AQOs, there was a need for the ENB/EPD to set up a system for effective monitoring of the extent of achieving the AQOs and for publicizing the progress of achievement periodically.

47. The **Under Secretary for the Environment** accepted the recommendation of the Committee that by incorporating appropriate performance targets in the Controlling Officer's Reports, members of the public and LegCo Members could effectively monitor the achievement of these performance targets and progress made in the implementation of the 22 air-quality improvement measures.

48. The **Under Secretary for the Environment** further said that the EPD would have to play the role of an activist in taking forward the recommendations of Audit and the Committee, including proactively disseminating to the public readily accessible and user-friendly air-quality information. The EPD would have to hold itself accountable to the public in publishing the measurement results against specified standards and addressing any concerns over inadequacies in achieving the AQOs.

49. According to paragraph 4.14 of the Audit Report, the Committee was concerned that although the EPD provided comprehensive information on its website on air quality and air pollution control in Hong Kong, some important information was not readily accessible by the public or regularly updated. The **Director of Environmental Protection** accepted Audit's recommendation that the EPD should make available on its website the information identified by Audit. She provided in her letter of 20 December 2012 (in Appendix 11) a list of readily accessible and user-friendly information on air programme, API information as well as emission inventory, etc. posted on the EPD website since October 2012.

E. Conclusions and recommendations

50. The Committee:

Overall comments

- is strongly of the view that government expenditure should be better spent on preventive measures to protect public health by improving air quality than on medical cost arising from curing health problems associated with air pollution;

- expresses great dissatisfaction and finds it unacceptable that:

  (a) the Director of Environmental Protection, as the Air Pollution Control Authority, has failed to achieve the air quality objectives ("AQOs") under section 8 of the Air Pollution Control Ordinance ("APCO") (Cap. 311) since their adoption in 1987;

  (b) despite the recommendations made by the Committee in its Report No. 29 of February 1998 that the Government should expedite action to revise the AQOs and plan ahead to implement additional control measures necessitated by the revised AQOs, the existing AQOs had neither been achieved nor revised in the past 15 years. The existing AQOs in Hong Kong were less stringent than the then health-based air quality standards of the World Health Organization ("WHO"), the United States Environmental Protection Agency and the United Kingdom;

  (c) the 2014 AQOs for respirable suspended particulates (expressed as "PM_{10}" which are particulate matters with a diameter of 10 micrometres (μm) or less), particulate matters with a diameter of 2.5 μm or less ("$PM_{2.5}$"), ozone ("O_3") and sulphur dioxide ("SO_2") were mostly set based on the WHO Interim Targets, which serve as milestones to facilitate a progressive approach for achieving the WHO Air Quality Guidelines ("AQGs"). The Environmental Protection Department ("EPD") had not set time targets with milestones for the progressive achievement of the 2014 AQOs, not to mention the timetable for further tightening the AQOs in light of the WHO AQGs;

(d) the EPD has set a performance target that there should not be any day in a year with air pollution index ("API") exceeding 100 but the EPD has never achieved this target since its adoption in 2006-2007; and

(e) the EPD had not reported to the Panel on Environmental Affairs ("EA Panel") of the Legislative Council ("LegCo") its action plan to revamp the existing API reporting system;

- notes that according to the EPD's consultant, upon attainment of the more stringent levels of AQOs that would take effect from 2014, about 4 200 unnecessary hospital admissions and 7 400 statistical life years would be saved each year (or an improved average life expectancy of around one month for the entire population);

- acknowledges:

(a) the commitment of the Secretary for the Environment and the Under Secretary for the Environment in that there had been a shift in the priority setting of the Government's policies recently, and the Government would focus on the enhancement of public health and take a proactive approach in managing air-quality strategy; and

(b) that, under the Policy Group led by the Chief Secretary for Administration, the Environment Bureau ("ENB") will seek to enhance and strengthen cross-bureaux and cross-departments co-operation in the formulation and implementation of air-quality improvement policies;

Specific comments

Management of air quality objectives

Revision of air quality objectives

- expresses grave concern over the worsening air pollution in Hong Kong and its acute health effects;

- notes that:

  (a) the AQOs serve as the statutory objectives for protecting public health and the key references to the EPD in assessing whether the air-quality impact of designated projects is acceptable for approval under the Environmental Impact Assessment Ordinance (Cap. 499); and

  (b) the Government projects for which Environmental Impact Assessment studies had not yet commenced would adopt the new AQOs;

- expresses great dissatisfaction and finds it unacceptable that the EPD had not taken the opportunity to revise the AQOs taking account of practices in other countries and cities after the 1997 Review and 2007 Consultancy Review;

- expresses great dissatisfaction and disappointment that the 2014 AQOs still do not provide adequate protection of public health when compared with the WHO AQG levels;

- does not accept the explanations given by the ENB and the Director of Environmental Protection as to why the Administration had not timely revised the AQOs in the past years;

- notes that:

  (a) the Government announced in January 2012 that it would adopt a new set of AQOs for implementation in 2014; and

  (b) the EPD has, in response to Audit's recommendation, committed to reviewing the AQOs at a frequency no less than once every five years;

Achievement of air quality objectives

- expresses great dissatisfaction and finds it unacceptable that although the EPD is tasked to achieve the AQOs, the existing AQOs have never been fully achieved since their adoption in 1987, i.e. some 26 years ago;

- expresses great dissatisfaction and disappointment that:

(a) the concentration levels of some pollutants have significantly exceeded the AQO limits and the limits specified in the AQGs of the WHO, which may cause detrimental health effects on members of the public; and

(b) the air quality in Hong Kong is unsatisfactory when compared with that of some world cities;

- notes that the Administration has agreed with Audit's recommendations that:

(a) the EPD will intensify efforts to reduce emissions to a level that minimizes health risk to the public;

(b) in collaboration with the relevant Government bureaux/departments ("B/Ds") and stakeholders, the EPD is implementing a package of 22 air-quality improvement measures with a view to achieving the new AQOs as soon as practicable;

(c) the EPD will continue to improve on the provision of air-quality data and information to the public, as well as to make the reports more reader-friendly;

(d) the ENB and EPD have put forward a series of vehicle emission-control measures targeting at franchised buses, liquefied-petroleum gas taxis and public light buses, and diesel commercial vehicles, and will formulate additional control measures to tackle roadside air-quality problems; and

(e) the five-year periodic review mechanism will enable the EPD to tighten progressively the AQOs and forthcoming working targets;

Administration of air pollution index

Air pollution index reporting system

- expresses grave dismay and finds it unacceptable that:

(a) the EPD has never achieved its performance target on API since setting the target seven years ago in 2006-2007;

(b) the EPD had not disseminated to the public readily accessible information on the upward trend of the number of days with API exceeding the very high level of 100 from 74 days in 2007 to 175 days in 2011, and the fact that the deterioration might have caused detrimental health effects on members of the public;

(c) the roadside air pollution has worsened in recent years, attributable to the vehicle emission problem; and

(d) there was a delay in the EPD's submission of the consultant's review report of the API reporting system to the Subcommittee on Improving Air Quality under the EA Panel;

- notes that:

(a) in April 2008, the EPD commissioned a consultancy study with a view to devising a new API reporting system for timely communication of air-related health risk to members of the public. The consultant only submitted its final review report to the EPD in June 2012; and

(b) the Administration has agreed with Audit's recommendation that the EPD is considering the recommendations of the consultant for the API review for revamping the API reporting system and has planned to engage relevant stakeholders to explain to them the operation and implications of the proposed new air-quality reporting system, and to develop necessary guidelines in the coming months. The new system will be implemented after completion of the preparatory work and approval of the new AQOs by the LegCo;

- acknowledges that the EPD:

(a) had, in December 2012, submitted to the Subcommittee on Issues Relating to Air, Noise and Light Pollution under the EA Panel the consultant's review report of the API reporting system;

(b) will consult the EA Panel in the second half of the 2012-2013 legislative session on its action plan to revamp the existing API reporting system, taking into account the findings and recommendations of the consultant; and

(c) will consider adopting more effective means to disseminate to the public the precautionary advice for roadside API exceeding 100;

Air-quality monitoring network

- expresses serious concern that:

  (a) only 10 of the 18 administrative districts have been provided with district-based APIs to provide timely air-quality information to the public, as the EPD considered the existing air-quality monitoring network adequate for collecting representative data for the purpose of formulating air-quality management strategies; and

  (b) the precautionary advice issued when a roadside API of a district exceeding 100 was not clear and specific;

- notes that:

  (a) the EPD had provided additional information on its website showing the district-based coverage of the general air-quality monitoring stations since October 2012;

  (b) the EPD had amended the precautionary advice for roadside API exceeding 100 since October 2012; and

  (c) the Administration has agreed with Audit's recommendation that the EPD will continue to review the air-quality monitoring network on an annual basis and monitor closely the need for setting up new stations;

- acknowledges that the EPD will set up a general API monitoring stations each in Tuen Mun and Tseung Kwan O, and the one in Tuen Mun will be put to use in the second half of 2013;

<u>Performance reporting</u>

- expresses grave concern that:

  (a) the EPD has not published in its Controlling Officer's Reports ("CORs") time targets for achieving the AQO levels and the progress of achieving the targets;

(b) the EPD has not published in its CORs the adverse trend in API performance against the EPD target; and

(c) some important information on the EPD's website was not readily accessible by the public or not regularly updated;

- notes that:

(a) the EPD had finalised the 2010 emission inventory, and the information was uploaded onto the EPD's website in October 2012;

(b) the EPD had included performance reporting of the air-quality situation on its website and improved the presentation of the reports; and

(c) the Administration has agreed with Audit's recommendations that:

(i) time targets for achieving the AQO levels will be announced in early 2013;

(ii) the EPD will report in the CORs if the performance targets are not met and the key reasons involved. Relevant follow-up measures will also be identified; and

(iii) for the emission-reduction measures targeting at vehicles and vessels, the EPD has been working on the implementation of measures jointly with the B/Ds concerned, and will monitor the progress of meeting these targets and compile regular reports as appropriate in collaboration with these B/Ds;

- acknowledges that the EPD will include in its CORs the progress made in implementing the 22 air-quality improvement measures and how that has been translated into the gradual attainment of the 2014 AQOs;

Way forward

- notes that the Administration:

(a) will take into account views and suggestions made by the Committee in the implementation of air-quality improvement measures; and

(b) has set up a Policy Group, chaired by the Chief Secretary for Administration, to coordinate policies on sustainable development, the environment and energy;

- strongly recommends that the policies and initiatives on the environment should be accorded a high priority in the Chief Executive("CE")'s 2013 Policy Address and the 2013-2014 Estimates;

- urges the Administration to consider commissioning studies on the health impact of local air quality;

- acknowledges that in his 2013 Policy Address, the CE:

(a) proposed to set aside $10 billion as subsidies to owners of over 80 000 heavily polluting pre-Euro and Euro I to III diesel commercial vehicles in order to phase out progressively these vehicles having regard to their pollution level;

(b) proposed to set a service life limit for newly registered diesel commercial vehicles at 15 years;

(c) undertook to explore ways to rationalize bus routing, enhance feeder service and improve interchange arrangements in order to reduce roadside pollution;

(d) planned to submit to LegCo in the next legislative session a legislative proposal for requiring ocean-going vessels at berth within Hong Kong waters to switch to low-sulphur diesel following the completion of consultation with the maritime sector; and

(e) planned to seek funding approval from the Finance Committee of LegCo to install onshore power supply facilities at the Kai Tak Cruise Terminal for use by cruise vessels; and

Follow-up action

- wishes to be kept informed of the progress made in implementing the various recommendations made by the Committee and Audit.