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Panel on Environmental Affairs

Meeting on 25 March 2019

Updated Background brief on review of Air Quality Objectives prepared by the Legislative Council Secretariat

Purpose

This paper provides updated background information on the review of the Air Quality Objectives ("AQOs") of Hong Kong, and gives a brief account of the major views and concerns expressed by Members when related issues were discussed by relevant committees of the Legislative Council.

Background

Air Quality Objectives

2. AQOs of Hong Kong are stipulated in the Air Pollution Control Ordinance (Cap. 311) ("APCO") as the objectives that should be achieved and maintained in order to promote the conservation and best use of air in the public interest. AQOs are also benchmarks for assessing the air quality impact of specified processes under APCO and of designated projects under the Environmental Impact Assessment Ordinance (Cap. 499) ("EIAO").[1]

3. In response to the release of the then new Air Quality Guidelines ("AQGs") by the World Health Organization ("WHO") in 2006, the Environmental Protection Department ("EPD") commissioned a consultancy

[1] The Technical Memorandum on Environmental Impact Assessment Process issued under EIAO sets out unified technical guidelines and criteria for the Environmental Impact Assessment ("EIA") procedures. The Technical Memorandum requires EIA studies to adopt the environmental objectives or requirements stipulated under various pollution control ordinances and other relevant ordinances as the criteria for assessment. Any update to these statutory objectives or requirements will automatically be applicable to EIAO at the same time.

study in 2007 on updating the former set of AQOs of Hong Kong which had been in place since 1987. Findings of a public consultation conducted in 2009 indicated general public support for the proposal to update the AQOs. With the passage of the Air Pollution Control (Amendment) Bill 2013 on 10 July 2013, the updated set of AQOs took effect from 1 January 2014.

4. The prevailing AQOs are benchmarked against a combination of interim and ultimate air quality targets in WHO's AQGs, and set out the standards for seven types of air pollutants, namely sulphur dioxide ("SO_2"), respirable suspended particulates ("PM10"), fine suspended particulates ("PM2.5"), nitrogen dioxide, ozone, carbon monoxide and lead (**Appendix I**).

Review of Air Quality Objectives

5. APCO requires the Secretary for the Environment to review AQOs at least once in every five years and submit to the Advisory Council on the Environment a report of the review. The Administration embarked on the AQOs review in mid-2016. In line with the practices of the European Union and the Unites States, the AQOs review encompasses the following key tasks:

(a) appraising the latest development in respect of air science and the health effects of air pollution;

(b) examining the current air pollution levels and trends, and progress and effectiveness of committed air quality improvement measures;

(c) identifying new practicable air quality improvement measures and conducting cost benefit analysis of the measures;

(d) developing an air quality management plan for further improving air quality; and

(e) assessing air quality in future under different control scenarios and the scope for further tightening AQOs for recommending a way forward.

6. An AQOs Review Working Group ("Working Group") chaired by the Under Secretary for the Environment was formed in May 2016 to engage relevant stakeholders.[2] Four dedicated subgroups on Road Transportation,

[2] The Working Group comprises some 60 external members from the fields of air science, health, green groups, academics, chambers of commerce, professional bodies (including urban planning experts) and relevant trades. Representatives from 10 government bureaux and departments ("B/Ds") such as the Development Bureau, Transport and Housing Bureau, Department of Health and Planning Department are also included, with the Environment Bureau and EPD as the lead B/D.

Marine Transportation, Energy and Power Generation, and Air Science and Health respectively were formed under the Working Group.[3] In addition, EPD conducted a public engagement exercise and two public forums in 2017 to solicit public views.

7. The Administration completed the AQOs review in December 2018. The results reveal that there are scopes for tightening AQOs for SO_2 and PM2.5 from Interim Target-1 to Interim Target-2 ("IT-2") of WHO's AQGs as follows:

(a) SO_2: the average 24-hour concentration limit stipulated in the AQOs could be tightened from 125µg/m3 at present to 50µg/m3, with the number of allowable exceedances (three times per year) unchanged; and

(b) PM2.5: the average 24-hour concentration limit stipulated in AQOs could be tightened from 75µg/m3 at present to 50µg/m3, with the number of allowable exceedances relaxed from the current level of not more than nine times to not more than 35 times per year; and the average annual concentration limit could be tightened from 35µg/m3 to 25µg/m3.

Major views and concerns expressed by Members

8. On 30 March 2016 and 26 June 2017, the Administration briefed the Panel on Environmental Affairs ("EA Panel") on the work plan and progress of the AQOs review respectively. During the examination of the Estimates of Expenditures in recent years, Members also enquired about issues relating to the AQOs review. The major views and concerns expressed by Members are summarized in the ensuing paragraphs.

Targets set for Air Quality Objectives

9. Members urged the Administration to consider setting more ambitious targets for AQOs with a view to aligning them with WHO's AQGs and bringing about substantial improvement in local air quality. Some Members raised doubts about the justifications to relax the number of exceedances allowed in respect of PM2.5 in the AQOs review completed in 2018.

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[3] The subgroups on Road Transportation, Marine Transportation, and Energy and Power Generation are to identify possible new air quality improvement measures under their respective areas and examine the practicability of their implementation within the timeframe up to 2025. The Air Science and Health subgroup examines the assessment of air quality improvements and health and economic impact arising from the possible measures, and hence the possible scope for further tightening AQOs.

10. The Administration explained that WHO recognized the need for governments to set national standards of AQOs according to their own circumstances, taking into account the local air quality situation, practicable technologies, as well as economic, political and social factors. It was important to ensure that AQOs were achievable by practical means. The Administration adopted a balanced approach in setting AQOs after considering the views from different stakeholders. While the ultimate goal was to meet WHO's AQGs, short and medium-term measures would need to be implemented with a view to progressively meeting the interim targets set by WHO in those guidelines.

11. The Administration further pointed out that WHO's AQGs did not provide recommendations on the number of exceedances allowed when formulating the guideline values of the concerned air pollutants (including PM2.5). If the AQO for 24-hour PM2.5 was to be tightened to IT-2, there could be more than 30 days on which the 24-hour PM2.5 concentrations at the north-western and northern parts of the New Territories would exceed the IT-2 level due to unfavourable meteorological conditions or regional air pollution influence. Setting the number of allowable exceedances at 35 in respect of PM2.5 was therefore appropriate and in line with international practices. The air science and health experts of the Working Group also considered the proposed approach to tighten the AQOs of PM2.5 could help enhance public health protection.

Measures to improve air quality

12. Members enquired about the Administration's measures to further improve air quality (including those undertaken in collaboration with the Mainland), in particular the reduction of air pollutant emissions from motor vehicles, marine vessels and power plants.

13. The Administration advised that a host of emission control measures had been taken in past years, including progressively phasing out pre-Euro IV diesel commercial vehicles, imposing statutory emission caps on power plants' emissions, and requiring newly imported non-road mobile machinery to comply with statutory emission standards. With effect from 1 January 2019, all vessels except for specified vessel types set out in the Air Pollution Control (Fuel for Vessels) Regulation (Cap. 311AB) were required to use compliant fuel within Hong Kong waters, irrespective of whether they were sailing or berthing. Looking forward, the Administration planned to progressively phase out Euro IV diesel commercial vehicles; retrofit Euro IV and Euro V double-deck franchised buses with enhanced selective catalytic reduction systems; and tighten the emission standards of first-registered motorcycles, light buses (design weight of more than 3.5 tonnes) and buses (design weight of not more than 9 tonnes). The Administration would also continue to review the emission caps for power plants with a view to further improving the air quality.

14. As regards collaboration with the Mainland, the Administration advised that the Hong Kong and Guangdong governments had set the 2015 emission reduction targets and the 2020 emission reduction ranges for four major air pollutants, namely SO_2, PM10, nitrogen oxides and volatile organic compounds in Hong Kong and the Pearl River Delta region. At the end of 2017, both sides confirmed the attainment of emission reduction targets in 2015 and finalized the reduction targets for 2020. Both governments had been pushing forward the next phase of emission reduction cooperation and had set up a science team to jointly carry out a study on post-2020 air pollutant emission reduction targets and concentration levels for Hong Kong and Guangdong.

15. Some Members observed that there might be difficulties in promoting and implementing measures such as fostering pedestrian-friendly and bicycle-friendly environment and utilization of intelligent transport systems as the scope of work straddled a number of government bureaux and departments ("B/Ds"). The Administration advised that representatives from the relevant B/Ds in the Working Group participated in the deliberations on the practicability to implement the air quality improvement measures and other tasks in the AQOs review. For example, representatives from the Department of Health who had taken part in WHO international conferences on air quality and public health would assist the Environment Bureau in the assessment of health impact arising from air pollution.

Air quality monitoring network

16. Some Members enquired whether the Administration would expand the air quality monitoring network in Hong Kong, with a view to monitoring the local air quality more effectively. The Administration explained that EPD operated a comprehensive air quality monitoring network ("AQMN") comprising general air quality monitoring stations ("AQMSs") and roadside AQMSs. EPD conducted annual review on AQMN based on established mechanisms and international guidelines to confirm the functionality and representativeness of the network. Pursuant to the 2015 AQMN review, having considered the uniqueness of the topography and future population and development plans of the Northern District and Southern District, EPD had planned to set up a general AQMS at each of these two districts.[4]

[4] According to the Administration, the construction of the two AQMSs will start in mid-2019 and the stations are expected to commence trial run at the end of 2019 or early 2020. By then the total number of general AQMSs in Hong Kong will be increased from 13 to 15.

Environmental impact assessment of public works projects

17. Some Members expressed concern that the Administration might tend to adopt less stringent targets for AQOs in order to facilitate implementation of various public works projects for which environmental impact assessment including assessment of the impact on local air quality was required.

18. The Administration advised that review of AQOs was essentially based on WHO's AQGs and scientific grounds. The assessment approaches adopted and the findings had been thoroughly discussed among air scientists and health experts in the Working Group. The environmental permit for any designated project would be issued with reference to the prevailing AQOs when the decision was made by the Director of Environment Protection. The prevailing AQOs would still be applicable before any new AQOs came into effect.

Council questions

19. At the Council meetings of 26 November 2014, 18 November 2015, 15 February 2017 and 30 January 2019, Hon Dennis KWOK, Hon CHAN Hak-kan, Hon Kenneth LEUNG and Hon CHU Hoi-dick raised questions relating to AQOs. The questions and the Administration's replies are hyperlinked in **Appendix II**.

Latest development

20. At the meeting on 25 March 2019, the Administration will brief EA Panel on the outcome of the AQOs review completed in December 2018.

Relevant papers

21. A list of relevant papers is set out in **Appendix II**.

Council Business Division 1
Legislative Council Secretariat
20 March 2019

Appendix I

Prevailing Air Quality Objectives of Hong Kong

Pollutant	Averaging time	Concentration limit (μg/m^3)	Number of exceedances allowed
Sulphur dioxide	10-minute	500	3
	24-hour	125	3
Respirable suspended particulates (PM10)	24-hour	100	9
	Annual	50	Not applicable
Fine suspended particulates (PM2.5)	24-hour	75	9
	Annual	35	Not applicable
Nitrogen dioxide	1-hour	200	18
	Annual	40	Not applicable
Ozone	8-hour	160	9
Carbon monoxide	1-hour	30 000	0
	8-hour	10 000	0
Lead	Annual	0.5	Not applicable

Note: All measurements of the concentration of gaseous air pollutants, i.e. sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.

[Source: Website of the Environmental Protection Department]

Appendix II

Review of Air Quality Objectives

List of relevant papers

Date	Event	Paper
1 April 2014	Special meeting of Finance Committee for examination of Estimates of Expenditure 2014-2015	Written question raised by a Member and Administration's reply (Reply serial number: ENB292)
30 March 2015	Special meeting of Finance Committee for examination of Estimates of Expenditure 2015-2016	Written questions raised by Members and Administration's replies (Reply serial numbers: ENB071, 091, 130, 164, 276, 280 and 307)
27 April 2015	Meeting of the Panel on Environmental Affairs ("EA Panel")	Administration's paper on "Progress of air quality improvement measures" (LC Paper No. CB(1)763/14-15(03)) Minutes of meeting (LC Paper No. CB(1)979/14-15)
30 March 2016	Meeting of EA Panel	Administration's paper on "Work Plan of the Review of Air Quality Objectives" (LC Paper No. CB(1)705/15-16(03)) Administration's follow-up paper (LC Paper No. CB(1)1010/15-16(02)) Minutes of meeting (LC Paper No. CB(1)969/15-16)
5 April 2017	Special meeting of Finance Committee for examination of Estimates of Expenditure 2017-2018	Written question raised by a Member and Administration's reply (Reply serial number: ENB110)

Date	Event	Paper
26 June 2017	Meeting of EA Panel	Administration's paper on "Progress of the Review of Air Quality Objectives" (LC Paper No. CB(1)1164/16-17(07)) Administration's follow-up paper (LC Paper No. CB(1)1373/16-17(02)) Minutes of meeting (LC Paper No. CB(1)23/17-18)
30 October 2017	Policy briefing cum meeting of EA Panel	Minutes of meeting (LC Paper No. CB(1)399/17-18)
17 April 2018	Special meeting of Finance Committee for examination of Estimates of Expenditure 2018-2019	Written question raised by a Member and Administration's reply (Reply serial number: ENB123)
22 October 2018	Policy briefing of EA Panel	Minutes of meeting (LC Paper No. CB(1)276/18-19)
19 December 2018	Meeting of EA Panel	Administration's paper on "Progress on Improving Roadside Air Quality" (LC Paper No. CB(1)319/18-19(04))
January 2019	Letter from Hon CHU Hoi-dick to EA Panel Chairman appealing for early discussion of matters relating to the review of Air Quality Objectives (Chinese version only) and EA Panel Chairman's reply (Chinese version only)	Letter dated 1 January 2019 from Hon CHU Hoi-dick (LC Paper No. CB(1)482/18-19(01)) EA Panel Chairman's written reply dated 17 January 2019 to Hon CHU Hoi-dick (LC Paper No. CB(1)482/18-19(02))

Hyperlink to relevant documents:

Organization	Document
World Health Organization	Air quality guidelines. Global update 2005. Particulate matter, ozone, nitrogen dioxide and sulfur dioxide

Hyperlinks to relevant Council Questions:

Date	Council Question
26 November 2014	Press release on Council question (oral) raised by Hon Dennis KWOK
18 November 2015	Press release on Council question (oral) raised by Hon CHAN Hak-kan
15 February 2017	Press release on Council question (written) raised by Hon Kenneth LEUNG
30 January 2019	Press release on Council question (oral) raised by Hon CHU Hoi-dick
30 January 2019	Press release on Council question (written) raised by Hon Kenneth LEUNG