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Panel on Environmental Affairs

Meeting on 28 June 2010

**Updated background brief on review of Air Quality Objectives
prepared by the Legislative Council Secretariat
(Position as at 23 June 2010)**

Purpose

This paper sets out the progress of the review of Air Quality Objectives (AQOs), and gives a brief account of the views and concerns expressed by the Panel on Environmental Affairs (the Panel) and the Subcommittee on Improving Air Quality (the Subcommittee) formed under the Panel.

Introduction

2. In Hong Kong, AQOs are set out in the Technical Memorandum of the Air Pollution Control Ordinance (Cap. 311) (APCO). AQOs stipulate appropriate concentration targets for selected air pollutants which serve as the references for the Authority (i.e. the Director of Environmental Protection) in deciding on the levels of emissions permitted for specified process licences granted under APCO, and in assessing whether the air quality impacts of designated projects are acceptable for approval under the Environmental Impact Assessment Ordinance (Cap. 499). AQOs also provide the key references for determining Air Pollution Index. The current AQOs, which cover seven major air pollutants, were established in 1987. The existing AQOs and achievement status as in November 2006 are in the **Appendix**.

Review of AQOs

3. In October 2006, the World Health Organization (WHO) released a new set of Air Quality Guidelines (AQGs), which provide a scientific basis for supporting the development of air quality policies and management strategies in various parts of the world to protect human health. Owing to the stringency of the new AQGs, WHO has recommended interim targets in the new guidelines for countries to improve their air

quality progressively. The actual air quality standards set in each country will vary according to the approach adopted for balancing health risks, technological feasibility, economic considerations as well as various other political and social factors. WHO also advises that governments should consider their own local circumstances carefully before adopting the new AQGs as statutory standards.

4. Since the new WHO AQGs are much more stringent than the current AQOs, achieving the new WHO AQGs in Hong Kong will require drastic measures to be taken not only in Hong Kong, but also the Pearl River Delta Region which has great influence on the pollution in Hong Kong. To draw up a new set of AQOs for Hong Kong and devise a long-term plan for meeting such new AQOs, the Administration needs not only detailed information on required specified measures, their implications and available options, but also full public participation. In this connection, the Administration has commissioned a consultancy study in 2007 for completion by the third quarter of 2008 to recommend a new set of AQOs for Hong Kong and an air quality management strategy to achieve the new AQOs. An Advisory Panel comprising members from various disciplines, including health, air science, industry and transport trades, as well as representatives of relevant Government bureaux and departments, has been formed to steer the Review. Upon completion of the study, a public engagement process will be conducted to finalize the new AQOs and the required long-term strategy on air quality management within 2009.

Preliminary findings of the Review

5. Guided by WHO AQGs and their interim targets and taking into account local circumstances, the consultant recommends that a progressive, forwarding-looking approach should be adopted in determining the new AQOs as follows –

Pollutants	Averaging Time	Existing AQOs		Proposed AQOs*							
		($\mu\text{g}/\text{m}^3$)	#	IT-1		IT-2		IT-3		AQG	
		($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#
Sulphur dioxide	10-min	-		-						500	3
	24-hour	350	1	125	3	50		-		20	
Respirable Suspended Particulates (PM10)	24-hour	180	1	150		100	9	75		50	
	1-year	55	0	70		50	0	30		20	
Fine Suspended Particulates (PM2.5)	24-hour	-		75	9	50		37.5		25	
	1-year	-		35	0	25		15		10	
Nitrogen dioxide	1-hour	300	3	-						200	18
	1-year	80	0	-						40	0
Ozone	8-hour	240 ¹	3	160	9	-			100		

Pollutants	Averaging Time	Existing AQOs		Proposed AQOs*							
		($\mu\text{g}/\text{m}^3$)	#	<i>IT-1</i>		<i>IT-2</i>		<i>IT-3</i>		<i>AQG</i>	
		($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#	($\mu\text{g}/\text{m}^3$)	#
Carbon Monoxide	15-min	-								100,000	
	30-min	-								60,000	
	1-hour	30,000	3			-				30,000	0
	8-hour	10,000	1			-				10,000	0
Lead	1-year	1.5 ²	0			-				0.5	0

Notes

* The proposed AQOs are presented in bold faces with greyish background.

Number of exceedances to be allowed:

Any exceedance measured at the general air quality monitoring station(s) at any one time would be counted as one exceedance against the number allowed for a calendar year. The number of exceedances is recommended with reference to the current practices overseas as well as to the predicted air quality situation of Hong Kong after full implementation of the Phase I measures.

¹ There is no existing 8-hour AQO for ozone in Hong Kong. The figure presented above is the 1-hour AQO.

² There is no annual AQO for lead in Hong Kong. The figure presented above is the 3-month AQO

6. To achieve the new AQOs, the consultant has preliminarily identified a host of comprehensive emission reduction measures which the Government may consider implementing to improve air quality. These measures mainly target at the following areas –

- (a) cutting emissions from power plants by increasing the proportion of natural gas in the fuel mix for local electricity generation from the current 28% to say 50% or more;
- (b) advancing the earlier replacement of more polluting vehicles, including franchised buses, and promoting the use of more environment-friendly vehicles;
- (c) further tightening the control of emissions from vessels and other sources;
- (d) introducing suitable traffic management measures, such as low emission zones etc, to reduce roadside emissions;
- (e) expanding rail/tram network; and
- (f) promoting energy efficiency.

The conceptual outline of these measures together with a broad assessment on their emission reduction potential and a cost-benefit analysis are given in Appendix II to LC Paper No. CB(1) 1057/08-09(01) which is hyperlinked below for ease of reference.

On the assumption that the Guangdong side will continue to reduce emissions from its power, transport and industrial sectors in tandem with its economic growth, it is anticipated that the new AQOs can be achieved with the full implementation of the Phase I control measures, subject to suitable allowance for exceedance. Implementation of the Phases II and III measures will further reduce local emissions and help to achieve the next higher targets under WHO AQGs where applicable.

7. According to the Administration, some of the improvement measures would have significant cost/tariff implications. For instance, raising the current share of natural gas of domestic electricity generation to 50% or more could increase tariff by phases to at least 20% from the current level, given the need to install additional gas-fired generators and other emission reduction measures and the fact that natural gas is significantly more expensive than coal. The control measures affecting the transport sector may likewise carry tariff implications due to an increase in the capital expenditure and operation costs of the transport trades. For example, depending on the scale of the exercise, advancing the replacement of franchised buses could drive the fare increase pressure to about 15% in a single year. This will be on top of fare increases due to factors such as higher operating costs. There are also questions of how to fund the early replacement of nearly 3 000 buses, and the impact on franchised bus companies' financial accounts and operations. Furthermore, some measures may require legislation and impose significant resource implications on the Government. Cost aside, some recommendations require a new approach to infrastructure development or life style and behaviour changes to the community, and their implementation would require public acceptance.

Deliberations by the Subcommittee

8. The Subcommittee is tasked to monitor and study policies as well as public concerns on improving air quality. The Subcommittee held a series of meetings to discuss the preliminary findings of the Review of Hong Kong's AQOs and development of a long-term air quality management strategy for achieving the revised AQOs as well as the way forward. The report of the Subcommittee is hyperlinked below for ease of reference.

9. Some Subcommittee members held the view that APCO should be amended to explicitly provide for the protection of public health in setting the new AQOs. Instead of adopting different interim targets for different pollutants, consideration should be given to applying WHO AQGs in one go since there would not be any incentives for further improvement if AQOs were set too low. They were skeptical that the consultant was trying to use high costs to discourage the public from demanding for more vigorous measures to improve air quality. Others however supported the adoption of a progressive approach in tightening AQOs to ensure that the new AQOs were most suitable for Hong Kong. Concerted efforts from the Guangdong side were also necessary since air quality in Hong Kong was greatly affected by regional air quality.

10. On the cost-benefit analysis of Phase I measures, the Subcommittee generally considered that the two measures with the highest cost-benefit ratings, viz. early retirement of polluting vehicles and use of ultra low sulphur diesel (USLD) for local vessels, should be taken forward earlier. To this end, consideration should be given to mandating the early retirement of polluting vehicles, including franchised buses, using the one-off grant for the early replacement of pre-Euro and Euro I diesel commercial vehicles which had a low take-up rate.

Consultation document

11. On 23 July 2009, the Administration released the consultation paper entitled "Air Quality Objectives Review – Public Consultation". The consultation document sets out the main findings of the Review and seeks comments from interested parties on the proposed new AQOs, the package of proposed emission control measures, the pace which these measures should be taken forward, and the price that the community is willing to pay in return for better air quality. Taken into account the Subcommittee's view, the Administration has extended the consultation period from three months to 30 November 2009.

12. Given the significance of the consultation document, the Panel decided that initial discussion of the consultation document should be held by the Panel whereas the details should be followed up by the Subcommittee. In this connection, the Panel held a meeting on 29 July 2009 to receive a briefing on the consultation document by the Administration. Interested parties were also invited to express their views at the special meeting on 6 October 2009. Some Panel members questioned why only some of the proposed new AQOs could meet the WHO interim targets (ITs), and enquired about the timeframe for all AQOs to meet WHO AQGs. They also queried the way in which the consultation document was presented. By way of illustration, the consultation document stated that the average life expectancy of the population would only increase by about one month if the proposed Phase I emission control measures were implemented. However, some of the measures might result in a 20% increase in electricity tariffs and 15% increase in transport fares. They were concerned about the possible negative feedback if consultation was held on the basis of such information. They held the view that the types of information to be presented in the consultation document should include the health risk and premature deaths associated with air pollution. As the anticipated benefits of \$1,228 million should have included medical savings, some Panel members suggested that these savings should be ploughed back to fund other environmental initiatives, or used to cover the anticipated increase in cost/tariffs so that this would not be passed onto consumers.

13. As Hong Kong alone could not solve the regional air pollution problem even with the implementation of the emission control measures, Panel members stressed that concerted efforts from the Mainland were necessary to improve regional air quality.

Latest development

14. The Administration proposes to brief members on the findings of public consultation on Review of Air Quality Objectives at the Panel meeting on 28 June 2010.

Relevant papers

Information paper provided by the Administration for the Subcommittee on Improving Air Quality meeting on 19 March 2009

http://www.legco.gov.hk/yr08-09/english/panels/ea/ea_iaq/papers/ea_iaq0319cb1-1057-1-e.pdf

Ove Arup & Partners's powerpoint presentation materials on review of Hong Kong's Air Quality Objectives and Development of Long-Term Air Quality Management Strategy (Chinese version only)

http://www.legco.gov.hk/yr08-09/chinese/panels/ea/ea_iaq/papers/ea_iaq0319cb1-1133-1-c.pdf

Air Quality Objectives Review - Public Consultation

<http://www.legco.gov.hk/yr08-09/english/panels/ea/papers/ea0729-cppr090723-e.pdf>

Information paper provided by the Administration for the Environmental Affairs Panel meeting on 29 July 2009

<http://www.legco.gov.hk/yr08-09/english/panels/ea/papers/ea0729cb1-2361-1-e.pdf>

Minutes of the EA Panel meeting on 29 July 2009

<http://www.legco.gov.hk/yr08-09/english/panels/ea/minutes/ea20090729.pdf>

Minutes of the EA Panel special meeting on 6 October 2009

<http://www.legco.gov.hk/yr08-09/english/panels/ea/minutes/ea20091006.pdf>

Report of the Subcommittee on Improving Air Quality for submission to the Panel on Environmental Affairs

http://www.legco.gov.hk/yr08-09/english/panels/ea/ea_iaq/reports/ea_iaqcb1-2575-e.pdf

Council Business Division 1
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The Current Hong Kong AQO and Achievement Status

Pollutants	Averaging Time	Air Quality Objectives (µg/m ³)	Measured highest Concentrations in 2005 (µg/m ³) (In bracket is/are the station(s) where the highest data was/were recorded)		Status of Achievement	
					% of AQO at Highest Concentration	Evaluation of Achievement
Sulphur Dioxide (SO ₂)	1-hour	800	General Station	453 (Tap Mun)	57	Well achieved
			Roadside Station	476 (Mong Kok)	60	Well achieved
	24-hour	350	General Station	138 (Yuen Long)	39	Well achieved
			Roadside Station	114 (Mong Kok)	33	Well achieved
	Annual	80	General Station	32 (Kwai Chung)	40	Well achieved
			Roadside Station	25 (Central)	31	Well achieved
Nitrogen Dioxide (NO ₂)	1-hour	300	General Station	309 (Central/Western)	103	Not yet achieved
			Roadside Station	345 (Central)	115	Not yet achieved
	24-hour	150	General Station	147 (Tung Chung)	98	Achieved
			Roadside Station	195 (Causeway Bay)	130	Not yet achieved
	Annual	80	General Station	65 (Sham Shui Po)	81	Achieved
			Roadside Station	99 (Central)	124	Not yet achieved
Respirable Suspended Particulates (RSP)	24-hour	180	General Station	217 (Tung Chung)	121	Not yet achieved
			Roadside Station	191 (Causeway Bay)	106	Not yet achieved
	Annual	55	General Station	62 (Yuen Long)	113	Not yet achieved
			Roadside Station	84 (Causeway Bay)	153	Not yet achieved
Total Suspended Particulates (TSP)	24-hour	260	General Station	322 (Kwai Chung)	124	Not yet achieved
			Roadside Station	205 (Mong Kok)	79	Achieved
	Annual	80	General Station	104 (Yuen Long)	130	Not yet achieved
			Roadside Station	112 (Mong Kok)	140	Not yet achieved
Ozone (O ₃)	1-hour	240	General Station	365 (Tap Mun)	152	Not yet achieved
Carbon Monoxide (CO)	1-hour	30,000	General Station	5730 (Tung Chung)	19	Well achieved
			Roadside Station	4370 (Central)	15	Well achieved
	8-hour	10,000	General Station	4541 (Tung Chung)	45	Well achieved
			Roadside Station	3693 (Central)	37	Well achieved
Lead (Pb)	3-month	1.5		0.069 (Tsuen Wan, Annual average)	5	Well achieved