

## LEGISLATIVE COUNCIL BRIEF

### Update of Air Quality Objectives

#### INTRODUCTION

At the meeting of the Executive Council on 17 January 2012, the Council ADVISED and the Chief Executive ORDERED that-

- (a) we adopt the proposed new AQOs at **Annex A** together with the package of air quality improvement measures listed at **Annex B**, drawn up based on the result of the public consultation, which would be implemented subject to resource availability;
- (b) we start the preparatory work for the amendment of the Air Pollution Control Ordinance (Cap. 311) (APCO) with an aim to table the Amendment Bill in the 2012-13 session of the Legislative Council, with a view to having the proposed new AQOs take effect in 2014;
- (c) a further provision be included in the Bill to amend the APCO to provide for a time-limited transitional period to the effect that, for a project in respect of which an Environmental Permit (EP) has been issued under the Environmental Impact Assessment Ordinance (Cap. 499) (EIAO) before the coming into operation of the new AQOs, the new AQOs shall not apply to an application for variation of the EP submitted within 36 months from the commencement date of the new AQOs; and
- (d) for Government projects for which EIA studies have not yet commenced, they should endeavour to adopt the proposed new AQOs as the benchmark for conducting the air quality impact assessment under the EIA studies.

## JUSTIFICATIONS

2. The current AQOs, which were promulgated in 1987 under the APCO, set out the concentration limits of seven key air pollutants <sup>[1]</sup> in the ambient air. In response to the release of the new Air Quality Guidelines (AQGs) by the World Health Organisation (WHO) for global application for protection of public health, the Environmental Protection Department commissioned a consultancy study in 2007 to review Hong Kong's existing AQOs and develop a long-term air quality management strategy. Taking into account WHO's new guidelines and practices in other advanced countries, the review proposed a set of new AQOs which benchmarks against WHO's Interim Targets (ITs) and AQGs, accompanied by a host of proposed air quality improvement measures that are required to help Hong Kong achieve the new objectives. To gauge the public's response to the recommendations, a four-month public consultation was launched from July to November 2009. We reported the consultation findings, which show a general support for the proposed new AQOs, adoption of a staged approach in achieving the WHO's AQGs and implementation of the proposed package of air quality improvement measures, to the Environmental Affairs Panel of this Council in June 2010.

3. Taking account of the views of the community, we will adopt the proposed AQOs at **Annex A** put forth in the public consultation as the new AQOs for Hong Kong, which are broadly comparable to those being adopted in the EU and US.

## ACHIEVING THE PROPOSED NEW AQOs

4. As provided for in the APCO, the AQOs do not only provide yardsticks for measuring our air quality, but also offer statutory standards to be achieved as soon as is

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<sup>[1]</sup> The seven key air pollutants include sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), total suspended particulates (TSP), respirable suspended particulates (RSP or PM<sub>10</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>) and lead (Pb).

reasonably practicable and be maintained thereafter. In addition, they are the benchmarks for the assessment of air quality impacts in the licence applications of specified processes such as power plants under the APCO and designated projects under the EIAO. It is essential that we identify the necessary air quality improvement measures and draw up a realistic action plan for attaining the proposed new AQOs as part and parcel of the exercise for updating the AQOs with the ultimate goal to improving air quality.

5. To attain the proposed new AQOs, the AQOs Review has recommended 19 Phase I air quality improvement measures. Of these, we have already been pressing ahead with implementation of those measures over which the community has wider consensus. We are in the process of charting the way forward for the remaining measures and keeping that under review. Meanwhile, we have also been identifying additional measures with a view to attaining as soon as practicable the new AQOs. In this connection, we have proposed to upgrade the quality of marine fuels and introduce a strengthened emission control regime on petrol and liquefied petroleum gas vehicles. A list of these proposed air quality improvement measures are at **Annex B**. With these measures and further emission reduction on the Mainland side of the PRD region, Hong Kong's ambient air quality should be able to broadly comply with the proposed new AQOs.

## **PROMULGATION OF NEW AQOs**

6. Adoption of the proposed new AQOs requires amendments to the APCO. We would start the preparatory work. Our target is to introduce the Amendment Bill in the 2012-13 session of the Legislative Council. Taking account of the lead time for completing the legislative process and other necessary preparatory works, including formulation of modeling guidelines and compilation of emission inventories, our current estimate is to aim at having the new AQOs come into effect in 2014. We will move to update the air pollutant concentration limits, at the same time taking into

account WHO Guidelines and overseas practices for the application of such limits.

## **GOVERNMENT PROJECTS TO BENCHMARK AGAINST NEW AQOs**

7. The proposed new AQOs will only become statutory standards when they come into operation. To underscore Government's commitment to adopting the best practices as well as provide greater certainty to works departments in planning new development projects, all Government projects for which EIA studies have not yet commenced would endeavour to adopt the proposed new AQOs as the benchmark for conducting the air quality impact assessment under the EIA studies.

## **TRANSITIONAL ARRANGEMENT**

8. We need to consider carefully the impact the introduction of the new AQOs might have on projects already granted with an EP before the new AQOs come into operation. In the event that the amendments to the scope of such projects should warrant an application for a variation to the EP to be supported by a new EIA, the application of the new AQOs may cause substantial changes to the original design of the project and have major cost and programming implications. Having considered carefully the need to preserve the integrity of the EIA system as an ongoing mechanism, as well as the regulatory certainty for proponents of projects that have already completed the EIA process, we propose to provide for a time-limited transitional period of 36 months from the commencement date of the new AQOs, within which the new AQOs will not apply to an application for variation of an EP.

## **ENVIRONMENTAL IMPLICATIONS**

9. The proposed new AQOs aims to provide better protection of public health against air pollution. Modeling results show that with implementation of the proposed air quality improvement measures at **Annex B**, coupled with the continuous efforts of Guangdong in reducing air, our ambient air quality would broadly comply with the proposed new AQOs.

## **ECONOMIC IMPLICATIONS**

10. The delivery of the proposed new AQOs and the air quality improvement measures would help combat air pollution, thereby improving quality of life, reducing medical cost and indirectly raising labour productivity. The consultant estimates that 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) upon attainment of the proposed new AQOs<sup>[4]</sup>. Other health benefits, such as less people contracting asthma or other respiratory diseases, would also be expected. In addition, better air quality and visibility would help attract more tourists and foreign investments, and are conducive to attracting talents to stay and work in Hong Kong. All these would contribute to reinforcing our position as a world city and leading international business hub. The proposal would also facilitate further collaborative efforts with Guangdong in improving regional air quality and the development of environmental industry in the region.

11. The impacts of individual proposed air quality improvement measures, which have to be assessed on a case-by-case basis, would be felt differently by different sectors of the economy. In particular, the more stringent standards and requirements to comply with the proposed AQO would incur implementation costs for various businesses and raise their operating costs. Moreover, the proposed AQOs would raise

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<sup>[4]</sup> It should, however, be noted that these public health benefits are by no means definitive as the assessment is subject to different assumptions being used.

the standards required for obtaining the EIA approval for infrastructural projects, which may lead to higher mitigation costs in order to comply with the standards. The consultant nevertheless advises that, for indicative purpose, the annualized cost incurred by the public for implementing the proposed Phase I air quality improvement measures would be about HK\$ 596 million<sup>[5]</sup>. This is, however, significantly lower than the anticipated benefit of HK\$ 1,228 million per year due to the improvement of public health<sup>[5]</sup>.

12. Moreover, the proposed measures may have more significant impact on certain sectors of the economy, such as the power and transport sectors, than the others. The increase in electricity tariff arising from changing fuel mix to reduce emission would add burden to household's cost of living and increase the business cost for firms. Sectors with low profit margin and those which are heavy users of electricity, such as hotel and food services, would be more significantly affected. In the AQOs Review, it has estimated that the proposal for increasing the share of natural gas to 50% of our domestic electricity generation would raise the electricity tariff by at least 20%.

## **FINANCIAL AND STAFF IMPLICATIONS**

13. The implementation of the proposed new AQOs and air quality improvement measures, if pursued, would have resource implications for Environmental Protection Department and other relevant bureaux/departments. The proposed air quality improvement measures and their financial and staffing implications for Government would have to be assessed individually in the light of further studies and consultation. Funding for implementing the proposed measures will be sought in accordance with the established mechanism.

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<sup>[5]</sup> The costs include the incidental capital and operational costs on the entire community as a consequence of implementing the measures. For those measures involving accelerated replacement of assets, only the residual values of the assets but not the entire cost of replacement would be included because the proposal has merely advanced their replacement.

14. Since the proposed new AQOs will set higher standards, more vigorous mitigating measures and consequently longer planning lead time will likely be required for the implementation of capital works projects, particularly those which carry air quality impacts. While we are not able to quantify at this juncture the additional compliance costs for capital works projects under the new AQOs, the extra expenditure will inevitably further push up the already escalating capital works expenditure with major infrastructural facilities entering into the construction peak and rising inflation in the construction sector over the next few years.

## **SUSTAINABILITY IMPLICATIONS**

15. The proposal is conducive to the sustainability principles of seeking to find opportunities to enhance environmental quality, and providing a living environment which promotes and protects the health of the public.

## **PUBLIC CONSULTATION**

16. We have fully consulted the public and stakeholders on the proposed new AQOs and air quality improvement measures during the four-month public consultation. In conjunction with the relevant bureaux and departments, we will initiate further consultation with the affected trades and stakeholders for implementation of the proposed air quality improvement measures.

## **PUBLICITY**

17. The Secretary for the Environment will hold a press conference to announce the proposed update of the AQOs. A press release will be issued and a spokesman will be made available for media enquiries.

## **ENQUIRY**

18. For any enquiry relating to this brief, please contact Mr. W C Mok, Assistant Director of Environmental Protection (Air Policy), at 35098618.

**Environment Bureau/Environmental Protection Department**

**January 2012**

**Proposed New AQOs for Hong Kong**

Pollutants	Avg. Time	Existing AQOs		Proposed AQOs				
		( $\mu\text{g}/\text{m}^3$ )	No of Exceed-ances Allowed	WHO IT-1 <sup>[3]</sup> ( $\mu\text{g}/\text{m}^3$ )	WHO IT-2 <sup>[3]</sup> ( $\mu\text{g}/\text{m}^3$ )	WHO IT-3 <sup>[3]</sup> ( $\mu\text{g}/\text{m}^3$ )	WHO AQG ( $\mu\text{g}/\text{m}^3$ )	No of Exceed-ances Allowed
Sulphur Dioxide	10-min	--	--	-	-	-	<b>500</b>	3
	24-hr	350	1	<b>125</b>	50	-	20	3
Respirable Suspended Particulates (PM10)	24-hr	180	1	150	<b>100</b>	75	50	9
	Annual	55	NA	70	<b>50</b>	30	20	NA
Fine Suspended Particulates (PM2.5)	24-hr	--	--	<b>75</b>	50	37.5	25	9
	Annual	--	--	<b>35</b>	25	15	10	NA
Nitrogen Dioxide	1-hr	300	3	-	-	-	<b>200</b>	18
	Annual	80	NA	-	-	-	<b>40</b>	NA
Ozone	8-hr	240 <sup>[1]</sup>	3	<b>160</b>	-	-	100	9
Carbon Monoxide	1-hr	30,000	3	-	-	-	<b>30,000</b>	0
	8-hr	10,000	1	-	-	-	<b>10,000</b>	0
Lead	Annual	1.5 <sup>[2]</sup>	NA	-	-	-	<b>0.5</b>	NA

Proposed new AQOs

[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.

[3] The WHO accepts the need for governments to set national standards according to their own particular circumstances. The WHO guidelines therefore also suggest ITs on SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub> and O<sub>3</sub> to facilitate a progressive approach for achieving the ultimate AQGs and provide milestones in achieving better air quality.

**Air Quality Improvement Measures**

**1. Emission Capping and Control**

- (i) Increasing the ratio of natural gas in local electricity generation to 50% with additional emission abatement measures
- (ii) Early retirement of aged / heavily polluting vehicles
- (iii) Earlier replacement of Euro III commercial diesel vehicles with models meeting latest Euro standards
- (iv) Wider use of hybrid / electric vehicles or other environment-friendly vehicles with similar performance
- (v) 0.1% sulphur diesel for local vessels subject to confirmation of technical feasibility
- (vi) Government vessels adopt feasible measures to reduce nitrogen oxides emissions
- (vii) Electrification of aviation ground support equipment
- (viii) Emission control for off-road vehicles / equipment
- (ix) Strengthening volatile organic compounds (VOC) control

**2. Traffic Related Measures**

- (x) Low emission zones
- (xi) Car-free zone / pedestrianisation scheme
- (xii) Bus route rationalization

**3. Infrastructure Development and Planning**

- (xiii) Expand rail network
- (xiv) Develop cycle tracks in new development areas

#### **4. Energy Efficiency Measures**

- (xv) Mandatory implementation of the Building Energy Codes
- (xvi) Energy efficiency standards for domestic electrical appliances
- (xvii) Light-emitting diode (LED) or equivalent alternatives for traffic signal / street lighting
- (xviii) Tree planting / roof-top greening
- (xix) District cooling system for Kai Tak Development

#### **5. Other Measures Identified Further to the AQOs Review**

Taking advantage of the latest technological developments and to meet the public's aspiration for early improvement to the air quality, we have put forth the following additional air quality improvement measures-

- (i) Retrofit Euro II and III franchised buses with selective catalytic reduction devices to reduce their NOx emissions
- (ii) Tighten the emission control regime on emissions from LPG and petrol vehicles through remote sensing equipment and dynamometer tests
- (iii) Seek to collaborate with PRD governments in requiring ocean-going vessels to switch to cleaner fuels while berthing at PRD ports and set up an Emission Control Area in PRD waters over the longer term.