

**For discussion on
16 December 2019**

Legislative Council Panel on Environmental Affairs

Overall strategy for improving air quality

Purpose

This paper briefs Members on the Government's overall strategy for improving air quality.

Air pollution and targets in Hong Kong

2. Air pollution in Hong Kong has three main areas of concern. Roadside air pollution, being the first problem, is mainly due to emissions from local vehicles, and is affecting every person walking or working on roads. The second problem is the ambient air quality, which is the air the public breath in day in day out. Apart from vehicle emissions, power plants, business and industrial activities, marine vessels, and operation of construction sites are all emitting pollutants that affect the ambient air quality. The third issue is related to the developments in Hong Kong and the southern part of China which have an impact on regional air quality, leading to smog problem. The smog formed will not only constitute visual impact, but its fine suspended particulates (FSP or PM_{2.5}) also adversely affect public health.

3. To protect public health, the "Air Quality Guidelines Global Update 2005" (AQGs) of the World Health Organisation (WHO) have promulgated a set of air quality ultimate and interim targets for various key air pollutants including respirable suspended particulates (RSP or PM₁₀), FSP, sulphur dioxide (SO₂), nitrogen dioxide (NO₂), ozone, carbon monoxide and lead, based on a wealth of studies on the effects of air pollution on health. This enables governments to, having regard to their local circumstances, set their interim targets and adopt measures, to progressively improve their air quality with a view to achieving the ultimate targets of the WHO AQGs. Governments have been striving to

improve air quality. However, as the WHO AQGs are strict and forward-looking, at present, no country has fully adopted the AQGs as its statutory air quality standards.

4. The air quality management policy of Hong Kong aims to protect public health, as well as progressively improve air quality, with a view to ultimately achieving the WHO AQGs. According to the AQGs, we have to set interim goals for developing short term air quality improvement plans. Therefore, we are setting Hong Kong's Air Quality Objectives (AQOs) and formulating the Clean Air Plan in accordance with the interim targets recommended by the WHO, to control sources of pollution such as power plants, industrial activities, road vehicles by implementing various emission reduction measures, so as to improve the air quality on a sustainable basis. The Government is reviewing the AQOs and the progress in improving air quality every five years, to ascertain the effectiveness of measures and updates required, in order to progressively attain the ultimate targets of the WHO AQGs.

Progress and challenges ahead

5. The air quality improvement measures implemented over the years have brought substantive improvement. Taking the measurements at the Kwun Tong air quality monitoring station as an example, compared with the pollutants concentrations measured in the 1980s, the concentrations of SO₂, RSP and NO₂ in 2018 have reduced by around 90%, 40% and 50% respectively. The overall improvement of air quality in Hong Kong in recent years is more evident. From 2013 to 2018, the ambient concentrations of major air pollutants, including RSP, FSP, NO₂ and SO₂, have dropped by 28% to 54%, whereas roadside concentrations of such air pollutants have also dropped by 32% to 36%. As regards smog, the hours of reduced visibility in Hong Kong has reduced from 978 hours in 2013 to 518 hours in 2018, which improves by 47%.

6. In future, challenges related to air quality include –
- (a) Poor roadside air quality, NO₂ and diesel particulates still present major threats to public health. To have marked improvements, we need to deal with the most polluting vehicles (old diesel buses, trucks, lorries and coaches) with bold actions, and enhance the local charging infrastructure to prepare for the wide adoption of electric vehicles (EVs) in future;
 - (b) Due to limited availability of channels on sea, Hong Kong is especially vulnerable to vessel emissions because many ships emit pollutants while berthing and sailing near populated areas;
 - (c) Emissions from local power plants have been greatly reduced. To further cut down emission will have to alter the fuel mix of the power generation so as to reduce reliance on burning coal; and
 - (d) Hong Kong is also affected by regional and super-regional pollution arising from sources in Guangdong and areas further away. The concentration of FSP has largely reduced and the problem of smog has been eased as a result of the long term collaboration with the Guangdong Provincial Government to improve regional air quality. However, the background level of ozone is still on a slowly rising trend.

7. To overcome these challenges, apart from the cooperation among bureaux and departments, we rely on collaborating with the community to deliver the greatest benefits to public health and other social benefits. The paragraphs below will elaborate on the short- to medium-term air quality improvement measures adopted by the Government in dealing with the above-mentioned challenges. These measures involve six areas of works, namely, reducing emissions of vehicles, promoting the use of EVs, reducing emissions of marine vessels, emission control of power plants, review of the AQOs, and regional collaboration.

Reducing emissions of vehicles

8. Key roadside air pollutants from vehicles are RSP, FSP and nitrogen oxides (NO_x). About 20% of the total number of vehicles are commercial vehicles including goods vehicles, buses, light buses and taxis. However, they are key emission sources of air pollutants at the roadside, accounting for more than 90% of the total vehicular emissions in Hong Kong. Hence, commercial vehicles have all along been a major target of the Government's measures to improve roadside air quality. The Government is committed to tackling this major challenge, and is implementing the measures detailed below, so as to improve roadside air quality on a sustainable basis.

Phasing Out Diesel Commercial Vehicles (DCVs)

9. DCVs are one of the major sources of roadside air pollution. To improve roadside air quality and protect public health, the Government launched an incentive-cum-regulatory scheme in March 2014 with a view to phasing out in phases some 82 000 pre-Euro IV DCVs, including goods vehicles, light buses and non-franchised buses, by the end of 2019. The Legislative Council (LegCo) has approved \$11.4 billion for ex-gratia payment to assist the affected vehicle owners.

10. As at the end of October 2019, about 76 000 pre-Euro IV DCVs (i.e., about 93% of the eligible vehicles) have been retired under the scheme. Ex-gratia payment of about \$10 billion was approved. All pre-Euro, Euro I and Euro II DCVs have been phased out.

11. The ex-gratia payment application for Euro III DCVs will close by the end of 2019. However, the Government recognises that the transport trades are facing immense operating difficulties under the current economic situation. Some owners may not be able to complete all necessary procedures for scrapping and de-registering their Euro III DCVs and applying for the ex-gratia payment on or before the deadline of the scheme. In view of the above, the Government provides a special arrangement which extends the deadline for ex-gratia payment application for Euro III DCVs for six months to 30 June

2020.

12. To further improve roadside air quality, the Chief Executive proposed the introduction of a new incentive-cum-regulatory scheme to phase out about 40 000 Euro IV DCVs in phases in the 2018 Policy Address. The Government is in full speed to work out the details of implementation, and will brief the Panel at the meeting next month.

Tightening vehicle emission standards for first registered vehicles

13. The Government has tightened the vehicle emission standards for first registered vehicles (except for diesel private cars, buses with a design weight of not more than nine tonnes, light buses with a design weight of more than 3.5 tonnes, motorcycles and tricycles) from Euro V to Euro VI in phases according to vehicle classes from 1 July 2017. The emission standards for first registered diesel private cars were also tightened from California LEV II to LEV III from 1 October 2017. We are making preparations to tighten the vehicle emission standards of first registered motorcycles to Euro IV and that of first registered light buses (design weight of more than 3.5 tonnes) and buses (design weight of not more than nine tonnes) to Euro VI in phases starting from the second half of 2020. We have consulted the Advisory Council on the Environment and the LegCo Panel on Environmental Affairs on 3 and 19 December 2018 respectively, and is prepared to amend the Air Pollution Control (Vehicle Design Standards) (Emission) Regulations (Cap. 311J) to implement the above proposals.

Strengthening control of emissions

14. The Government has been deploying remote sensing equipment to identify petrol and liquefied petroleum gas (LPG) vehicles with excessive emissions since 2014. Owners of vehicles with excessive emissions are required to repair their vehicles within a prescribed period so as to rectify the problem. Up to end-October 2019, about 4 million vehicle counts have been monitored under the programme. During the period, the Government has issued about 21 000 emission testing notices and cancelled about 710 vehicles

licences.

15. We have progressively increased the deployment of roadside remote sensors in 2018 from up to three locations per day previously, to up to five locations. The data as at June 2019 shows that the portions of LPG and petrol vehicles with excessive emissions have reduced from 80% and around 10% in 2014 respectively, to 16% and less than 3%.

Trial of retrofitting franchised buses with enhanced selective catalytic reduction (SCR) systems

16. Based on the requirement of retirement age at 18, we estimated that 10 and 18 years are required to phase out all Euro IV and V franchised buses respectively. Retrofitting these buses with new emission reduction devices can effectively reduce their emissions before retirement.

17. The Government will fully subsidise franchised bus companies (FBCs) to conduct a trial of retrofitting Euro IV and V diesel double-deck buses of dominant bus models with enhanced SCR systems, so as to test the technical feasibility of the retrofitting work, and confirm the emission reduction performance of the enhanced SCR systems of different suppliers under the local driving and operational conditions. We have set up a task force comprising the FBCs, the Environmental Protection Department (EPD), the Transport Department (TD) and local experts, and is now working with the TD and the FBCs in drafting the specifications and detailed arrangements of the trial.

Promoting wider use of EVs

18. The Government has been actively promoting wider use of EVs by offering first registration tax concessions for EVs, allowing 100% profits tax deduction for acquiring EVs, providing subsidy for trials of electric commercial vehicles under the Pilot Green Transport Fund, subsidising FBCs for trials of single-deck electric buses, granting concessions on gross floor area for EV charging-enabling car parks in new buildings, enhancing the public EV charging

network, and establishing a dedicated team and hotline to provide relevant information and technical support in setting up charging facilities. The number of electric private cars in Hong Kong has grown from 70 in 2010 to 12 800 by end-October 2019, accounting for 2% of the total number of the private cars. According to our online research, the adoption rate of electric private cars of Hong Kong comes second to Beijing in Asia¹.

Trial of electric buses, public light buses and taxis

19. The Government has fully subsidised FBCs to procure 36 single-deck electric buses (28 battery-electric buses and eight supercapacitor buses) for trial. 26 battery-electric buses and seven supercapacitor buses have commenced a two-year trial. The remaining electric buses are expected to be put into service gradually in 2020.

20. To promote the development of electric public light buses, the Government has engaged a consultant in 2019 to formulate the basic technical requirements and specifications of electric public light buses and associated charging facilities that suit Hong Kong's operating conditions, and is making preparations for the implementation of a trial scheme on electric public light buses.

21. Under general operating mode, taxis are operating for more than 20 hours a day with a daily mileage of over 500 km. Suitable electric taxis models and the establishment of a quick charging network for drivers to charge in time are both required for the promotion of electric taxis. The Government has commissioned a consultant in October this year to look for suitable sites for setting up quick charging stations, and will continue to encourage suppliers to introduce more electric taxi models that suit local use.

¹ We have collected online information on the use of electric private cars in major Asian cities including Beijing, Hong Kong, Shanghai, Singapore, Seoul and Taipei. Among these cities, Hong Kong's adoption rate of electric private cars is ranked second after Beijing.

Enhancing charging infrastructure

22. The Government will continue to enhance EV charging infrastructure to prepare for the popularisation of EVs in future. Apart from those located at the TD car parks which will be demolished, and some 100 chargers which have both standard and medium charging functions, standard chargers at the car parks of the TD and the Government Property Agency that are open for public use have all been upgraded to medium chargers. The Government has allocated \$120 million to extend the public EV charging networks at government car parks in the coming three years, including installation of additional medium chargers at car parks managed by the TD, Government Property Agency, Leisure and Cultural Services Department, and Tourism Commission which are open to the public. The number of public chargers in the government car parks is expected to reach about 1 800 by 2022.

23. We implemented a measure in 2011 to encourage car parks in new buildings to provide EV charging-enabling infrastructure. The Government is also making preparations for a \$2 billion pilot subsidy scheme to subsidise installation of EV charging-enabling infrastructure in eligible car parks of existing private residential buildings. Please refer to the discussion paper *Further Measures to Improve Air Quality (Part 1)* for details.

Pilot Green Transport Fund

24. The Government has put in place the \$300 million Pilot Green Transport Fund in March 2011 to encourage the transport sector to test out green innovative transport technologies. As at end-November 2019, 163 trial applications were approved², including 99 on EVs, 56 on hybrid vehicles and eight applicable to buses or ferries. About \$146 million of subsidies have been approved. The Government is conducting a review on the current scope of the fund. Details will be elaborated at the Panel meeting next month.

² Excluding applications withdrawn after approval.

Reducing emissions of marine vessels

25. Marine vessels are the major local air pollution emission source, accounting for 52%, 34% and 37% of the emissions of SO₂, RSP and NO_x respectively in 2017. To reduce emissions from the marine sector, the Government has introduced the following measures -

- (a) Air Pollution Control (Marine Light Diesel) Regulation (Cap. 311Y)
A statutory cap of 0.05% on the sulphur content of locally supplied marine light diesel has been imposed since 1 April 2014, which is 90% lower than the previous limit of 0.5%. To encourage vessels using cleaner fuels, the Government plans to explore further tightening of the maximum sulphur content of the locally supplied marine light diesel to 0.001% and will consult relevant stakeholders.

- (b) Air Pollution Control (Fuel for Vessels) Regulation (Cap. 311AB)
From 1 January 2019, all vessels are required to use compliant fuel (including low-sulphur marine fuel with sulphur content not exceeding 0.5%) within Hong Kong waters, irrespective whether they are sailing or berthing³. We anticipate that, as compared with the 2017 emission levels, the emissions of SO₂ and RSP from ocean-going vessels will be reduced by 7 300 tonnes (91%) and 740 tonnes (79%) respectively.

Pilot scheme on new energy ferries

26. To reduce emissions from ferries and enhance the image of Hong Kong, the Government plans to launch a pilot scheme on electric ferries serving in-harbour routes of the Victoria Harbour in order to test their operation on such routes. We have established a working group comprising members from relevant departments including the EPD, Transport and Housing Bureau, TD, Marine Department to work out the details and the budget of the pilot scheme. Details of the scheme will be provided at the Panel meeting next month.

³ All ocean-going vessels have been required to switch to compliant fuel while berthing in Hong Kong since 1 July 2015.

Emission control of power plants

27. The electricity sector is one of the major emission sources of air pollutants in Hong Kong, and is subject to the licensing control and emission caps under the Air Pollution Control Ordinance (Cap. 311) (APCO). In 2017, emissions of SO₂, NO_x and RSP from the electricity sector accounted for 43%, 27% and 16% of the territory-wide emissions respectively.

28. To reduce emission of air pollutants from power plants, we have put in place strict control measures including banning the construction of new coal-fired generating unit since 1997, as well as increasing local gas generation to around 50% of the total fuel mix for electricity generation by 2020.

29. In addition, we have gradually specified the emission caps for all power stations (including power stations at the Castle Peak, Black Point, Penny's Bay and Lamma) since August 2005, and tightened the caps whenever practicable during the renewal of relevant licences, in order to reduce emissions from public electricity generation.

30. The Government also amended the APCO in 2008 to empower the Government to put a cap on the emissions of power plants by way of Technical Memoranda (TMs). Seven TMs were issued between 2008 and 2017 to progressively tighten the emission caps for power plants from 2010 to 2022 and beyond.

31. The Government completed the review of the Seventh TM this year and prepared a new TM (the Eighth TM), which was passed by the LegCo in November 2019. Compared with the emission caps set under the Seventh TM, the Eighth TM will further tighten the emissions of SO₂, NO_x and RSP for the electricity sector from 2024 onwards by 40%, 29% and 20% respectively.

Review of the AQOs

32. The prevailing AQOs took effect on 1 January 2014⁴. The APCO requires the Government to review the AQOs at least once every five years. The Government completed a review in December 2018.

33. Based on the review findings, Hong Kong's air quality will be further improved by 2025 through the implementation of the ongoing and committed new measures. Six of the prevailing AQOs of Hong Kong are benchmarked against the ultimate targets of the WHO AQGs. We recommend further tightening the AQOs of SO₂ and PM_{2.5} as follows:

- (1) tightening the 24-hour AQO of SO₂ from Interim Target-1 (IT-1) (125µg/m³) of the WHO AQGs to Interim Target-2 (IT-2) (50µg/m³) with the current number of exceedances allowed (three per year) remains unchanged;
- (2) tightening the annual AQO of PM_{2.5} from IT-1 (35µg/m³) to IT-2 (25µg/m³); and
- (3) tightening the 24-hour AQO of PM_{2.5} from IT-1 (75µg/m³) to IT-2 (50µg/m³) with the number of exceedances allowed adjusted from the current nine to 35.

34. The prevailing AQOs and the AQOs proposed to be tightened are listed in **Annex A**.

35. We have reported the review findings to the Panel in March 2019⁵ and conducted a public consultation between July and October 2019. We have held consultation forums for the public and stakeholders, and exchanged views with professional institutions, a business chamber and a concern group. We have also set up a webpage for the consultation and uploaded the consultation

⁴ The prevailing AQOs are benchmarked against the interim targets and ultimate targets of the World Health Organisation (WHO) Air Quality Guidelines (AQGs). Among the 12 AQOs, six of them including SO₂ (10-min), NO₂ (1-hour and annual), carbon monoxide (1-hour and 8-hour) and lead (annual) have already adopted the ultimate targets of the WHO AQGs, while the remaining are at the interim targets.

⁵ *Review of Air Quality Objectives* – LegCo Paper No. CB(1)723/18-19(03).

document and views collection form to collect public views. We received a total of 282 submissions, including 246 views collection forms and 36 written submissions. The major views from the general public towards the proposed tightening of the AQOs are summarised below. Other analysis and the views collection forms findings are at **Annex B**:-

- (1) Most of the respondents agreed that we should follow the recommendations of the WHO AQGs to continuously explore new air quality improvement measures and balance the development of the society, with a view to progressively tightening the AQOs to the ultimate targets of the WHO AQGs;
- (2) The public did not raise any objection to the proposed tightening of the 24-hour AQO of SO₂ and annual AQO of PM_{2.5}; and
- (3) Slightly more than half of the respondents understood or had no comment on the proposed tightening of AQOs (including the 24-hour AQO of PM_{2.5}). There were responses which supported explicitly the adjustment of the number of exceedances allowed to 35, coupled with the tightening of the concentration level of the 24-hour AQO of PM_{2.5}. Also, about one-fourth of the submissions opposed or had reservation to the proposed adjustment of the number of exceedances allowed to 35.

36. Regarding the recommendation of tightening the 24-hour AQO of PM_{2.5} and adjusting the number of exceedances allowed to 35, we need to consider exceedances due to uncontrollable factors when setting short-term (e.g. 24-hour) AQOs in accordance with the WHO AQGs. As for Hong Kong, uncontrollable factors affecting concentrations of particulate matters (including PM_{2.5}) include unfavourable meteorological conditions or regional air pollution influence. Based on EPD's air quality monitoring data between 2011 and 2017, the ambient air quality monitoring network recorded 17 exceedances of the prevailing 24-hour AQO of PM_{2.5}, while there were 30 exceedances of the recommended new AQO, indicating that the proposed AQO is scientifically more stringent than the prevailing one. Although we may not be able to tighten the 2025 24-hour AQO of PM_{2.5} to a more stringent level at this juncture to meet the expectation of some people in the society, we are reviewing the AQOs every five years and

tightening the AQOs progressively aligns with the principle set up in the WHO AQGs.

37. Taking into account the various factors and views gathered, and the protection of public health and the principle of progressively tightening the AQOs thus improving air quality on sustainable basis, we recommend to tighten the 24-hour AQO of SO₂ and the annual and 24-hour AQOs of PM_{2.5} in accordance with the review recommendations set out in paragraph 33 above. We will consult the Advisory Council on the Environment (ACE) about the above recommendations soon. Subject to the support of this Panel and the ACE, we will expedite to introduce an amendment bill to the LegCo for the implementation of the new AQOs.

Regional collaboration

38. The Hong Kong Special Administrative Region (SAR) Government has been working closely with the Guangdong Provincial Government and the Macao SAR Government to improve regional air quality. The Guangdong and Hong Kong SAR Governments are conducting a joint study on “post-2020 regional air pollutant emission reduction targets and concentration levels”, with a view to formulating emission reduction plans beyond 2020 for five major air pollutants, including SO₂, NO_x, RSP, FSP and volatile organic compounds (VOCs), as well as forecasting the attainable air quality levels. We anticipate that the reduction targets will be released in 2022.

39. In addition, to address the situation that the background level of ozone is still on a rising trend, the Guangdong, Hong Kong SAR and Macao SAR Governments will jointly conduct a study on “photochemical ozone pollution and characterisation of regional and super-regional transportation of ozone in the Greater Bay Area” in 2020 to better understand the formation of ozone and its regional and super-regional transportation in the Greater Bay Area and formulate effective control measures, take forward the regular monitoring of VOC concentration to step up regional ozone control, explore the establishment of an air pollution monitoring network using light detection and ranging technology in

the Greater Bay Area, strengthen the exchange in air quality forecasting between Guangdong and Hong Kong and hold the air quality forecasting meetings at the technical level so as to adopt appropriate preventive measures in advance.

Way forward

40. Members are invited to note the overall strategy for improving air quality. We will continue to implement the air quality improvement measures. After the completion of the AQO review and its update, we will further update the Clean Air Plan, with a view to formulating a long term plan to improve the air quality of Hong Kong continuously.

**Environment Bureau/Environmental Protection Department
December 2019**

**Hong Kong's Prevailing and Proposed New Air Quality Objectives (AQOs) and
Interim and Ultimate Targets of the World Health Organisation (WHO) Air
Quality Guidelines (AQGs)**

Pollutants	Averaging Time	WHO AQGs ($\mu\text{g}/\text{m}^3$)				No. of Exceedances Allowed in Hong Kong's Prevailing AQOs	
		Interim Target-1	Interim Target-2	Interim Target-3	Ultimate Target		
Sulphur dioxide (SO ₂)	10-min	--			<u>500</u>	3	
	24-hour	<u>125</u>	50	-	20	3	
Respirable suspended particulates (PM ₁₀)	Annual	70	<u>50</u>	30	20	Not applicable	
	24-hour	150	<u>100</u>	75	50	9	
Fine suspended particulates (PM _{2.5})	Annual	<u>35</u>	25	15	10	Not applicable	
	24-hour	<u>75</u>	50	37.5	25	<u>9</u>	35
Nitrogen dioxide (NO ₂)	Annual	--			<u>40</u>	Not applicable	
	1-hour	--			<u>200</u>	18	
Ozone (O ₃)	8-hour	<u>160</u>	-	-	100	9	
Carbon monoxide (CO)	1-hour	--			<u>30,000</u>	0	
	8-hour	--			<u>10,000</u>	0	
Lead (Pb)	Annual	--			<u>0.5</u>	Not applicable	

Notes:

<u>XX</u>
<u>XX</u>

Hong Kong's prevailing AQOs are indicated in green cells.

Proposed new AQOs and allowable number of exceedances are indicated in orange cells.

**Review of the Air Quality Objectives (AQOs)
Public Consultation**

Background

The Environment Bureau and the Environmental Protection Department (EPD) conducted a three-month public consultation between 12 July 2019 and 11 October 2019 to collect public views on the findings and recommendations of the review. To enhance public understanding of the consultation, we have prepared a public consultation document and a leaflet, and set up a dedicated public consultation website. In addition, we have also designed a views collection form for the public to submit their views online or by email, fax or post.

2. During the consultation period, we have hosted four consultation forums¹ for stakeholders and the public, and attended four discussion sessions held by professional institutions (the Hong Kong Institution of Engineers and the Hong Kong Institute of Qualified Environmental Professionals), a business chamber (the Hong Kong General Chamber of Commerce) and a concern group. There were about 400 participants. We also publicised the public consultation through electronic media including five Chinese and English electronic newspapers, the dedicated public consultation website, the consultation webpages on the EPD website and the GovHK portal, as well as the Big Waster pages in social media. Posters were also displayed at some 680 public venues such as sports grounds, public libraries, green facilities (e.g. the visitors' centre of the T•PARK and the Community Green Stations) and public housing estates.

¹ Stakeholders were invited by email to attend the stakeholders' consultation forums. The stakeholders included environmental groups, professional institutions, commercial and industrial organisations, tertiary institutions, transport trade, political parties, women's and youth groups, think tanks, etc. Legislative Council members, the Heung Yee Kuk and the 18 District Council Secretariats were also separately notified of the public consultation. A total of around 600 invitations were sent.

Findings of the Public Consultation and Analysis

Public views

3. We have received a total of 282 submissions during the consultation period. Among the submissions received, most (246 submissions or almost 90%) were using the views collection form set by the EPD, while the rest were submitted by email, fax or post, etc. About 80% of the submissions were from individuals, about 10% were from organisations such as environmental and concern groups, business chambers and political parties, and the remaining submissions had no indication of whether they were from individuals or organisations. In addition, four submissions were provided after the closing date of the public consultation (i.e. 11 October 2019) and were excluded from the analysis.

Findings of the views collection forms

4. The views collection form for the public consultation set out four questions. The public views collected on these questions are analysed as below:

Question 1: Hong Kong's air quality has been improving in recent years. Are you aware of the improvements in air quality and visibility?

5. Although the ambient and roadside concentrations of respirable suspended particulates (RSP or PM₁₀), fine suspended particulates (FSP or PM_{2.5}), sulphur dioxide (SO₂) and nitrogen dioxide (NO₂) have been significantly reduced by 28% to 54% from 2013 to 2018, among the 246 views collection forms received, slightly less than half of the respondents indicated that they were aware or slightly aware of the improvements in air quality and visibility in recent years. The remainder reported no awareness of such at all. This outcome may be related to the unabated ozone concentration in recent years, which led to the occasional surge of the Air Quality Health Index to high levels, thus giving the public an impression that there has been no improvement in air quality.

Question 2: The World Health Organisation (WHO) Air Quality Guidelines (AQGs) recommend governments of different places to continuously explore new air quality improvement measures and balance the development of the society, with a view to progressively tightening the air quality standards to achieve the WHO AQGs levels. Do you agree with this approach?

6. Among the 246 views collection forms received, near 90% of the responses agreed that the Government should progressively tighten the AQOs to the ultimate targets of the WHO AQGs. Only about 10% of the submissions disagreed with the progressive tightening of the AQOs. A few respondents considered that the Government should implement more measures to improve air quality, with a view to adopting the ultimate targets of the WHO AQGs as our AQOs immediately, or by 2030.

Question 3: What are your views on the proposed tightening of the AQOs for PM_{2.5} and SO₂ as recommended in this review?

7. Among the 246 views collection forms and 36 written submissions, 41% (115 submissions) understood the proposed tightening of the AQOs of PM_{2.5} and SO₂, while 12% (33 submissions) had no comment. The remaining 134 submissions (including 98 views collection forms received and 36 written submissions) offered other views, among which no response indicated any objection to the tightening of the 24-hour AQO of SO₂ and the annual AQO of PM_{2.5}. There were 70 submissions (about one-fourth of the 282 submissions) opposed or had reservation to the proposed tightening of the 24-hour AQO of PM_{2.5} to the Interim Target-2 level of the WHO AQGs while adjusting the number of exceedances allowed to 35. Nevertheless, a few submissions were in support of this proposal. In addition, 48 submissions indicated that the proposed tightening of the AQOs was lax, or the Government should further tighten the AQOs, even to the ultimate targets of the WHO AQGs immediately. There were also views that the AQOs of other pollutants such as PM₁₀ and ozone should be tightened in tandem.

Question 4: In your opinion, what kind of work should be paid attention to and covered in the next review of the AQOs?

8. Among the 246 views collection forms, 33% (82 submissions) agreed that the Government should adopt the same approach in the next review, 13% (33 submissions) had no comment on the approach, and the remaining 131 submissions (53%), as well as the 36 written submissions had other views. Such views touched upon various areas and the common views are list below:

- The Government should accord priority to the protection of public health in updating the AQOs, instead of the practicability of implementing air quality improvement measures;
- Implementation of air quality improvement measures should base on cost effectiveness instead of merely practicability;
- The Government shall set a roadmap to attain the ultimate targets of the WHO AQGs;
- The composition of the AQOs Review Working Group should be extended to achieve a wider representation from health professions, vulnerable groups, community groups, professional institutions, etc.;
- The Government should set up a standing committee to oversee the review; and
- The Government should increase the number of engagement/consultation sessions to collect further views from the public and stakeholders.

9. In addition, some views were about increasing the number of air quality monitoring stations, stepping up public education and publicity on air quality improvement and the effectiveness of relevant measures, as well as tackling regional air pollution tapping into the opportunities of the Greater Bay Area (GBA) cooperation, etc. These views were irrelevant to the approach of the next review.

Consultation Forums and Discussion Sessions

10. A professional institution and some environmental groups opined that adopting the Pearl River Delta (PRD) emission data of 2020 in the air quality

assessment for 2025 had not taken into account the potential air quality improvement brought by the implementation of various emission reduction measures in the PRD region in the next few years. Hence, the air quality assessment for 2025 would be conservative. We explained at the forums and meetings that the 2020 emission projection in the PRD region was the only data confirmed by the Guangdong authority. To keep the credibility of the review, we must use officially confirmed data to assess the changes in air quality in 2025.

11. A few environmental groups and concern groups queried whether the proposal of tightening the 24-hour AQO for PM_{2.5} from the present level of 75 µg/m³ to 50 µg/m³ while adjusting the number of exceedances allowed from 9 to 35 was more stringent than the present AQO. We clarified at the meetings that the setting of the number of allowable exceedances for the short-term AQO was based on the scientific air quality assessment results for 2025. To facilitate the public to compare the two AQOs, we quoted the historical air quality monitoring data. Between 2011 and 2017, the ambient air quality monitoring network recorded 17 exceedances of the prevailing 24-hour AQO of PM_{2.5} and 30 exceedances of the recommended new AQO, indicating that the recommended AQO is more stringent than the prevailing one.

12. Some participants of the consultation forums expressed concerns about the health impact arising from high NO₂ concentration at the roadside and the increase in ozone level. There were also views that the Government should enhance the PRD regional cooperation, as well as further improve the regional air quality at the GBA level.

13. A concern group raised concerns at different consultation forums about the air quality impact arising from an ongoing road works project with an environmental permit granted under the Environmental Impact Assessment Ordinance by the EPD, and requested the Government to step up air quality monitoring at nearby residential buildings.

-End-