



Response to Public Consultation on Review of Air Quality Objectives

Friends of the Earth (HK)

October 2019

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Clean Air for a Healthy and Sustainable Environment

Clean air is considered to be a basic requirement for population health. Hong Kong however has the highest level of air pollution in the world of any jurisdiction with a comparable GDP. According to the World Health Organization (WHO), there were more than 4 million premature deaths annually as a result of exposure to outdoor air pollution.¹ Further, according to the special report prepared by the International Energy Agency in 2016, the average Chinese life expectancy is shortened by 25 months as a result of poor air quality.²

Currently, Hong Kong's air quality related policies and standards are formulated and implemented by the Environment Bureau (ENB). Neither the Director of Health nor the Secretary for Food and Health are directly involved in the decision-making process to alleviate our daily exposures to air pollutants which cause cardio-pulmonary diseases, respiratory diseases, premature deaths, etc.

Friends of the Earth (HK) being one of the leading environmental health concerning group, with a vision to achieve "Healthy and Sustainable Environment for All", hopes to join hands with government officials, lawmakers and community stakeholders in promoting population health for the best social, environmental and economic benefits.

Background

2. WHO announced in October 2006 an updated set of Air Quality Guidelines (AQGs) since its first release in 1987. The AQGs provide scientific grounds for supporting the development of air quality policies and management strategies in various parts of the world to protect human health. Due to rising concerns in population health, new AQGs are becoming more and more stringent. In view of this, WHO has proposed interim targets for individual countries to improve their air quality in a progressive manner. However, at present, no country has fully adopted the ultimate targets of the AQGs as its statutory air quality standards.

3. The Chinese Government's action in tackling air pollution related premature deaths has been intense and broad in scope. The World Bank estimates that by 2020, China will be paying US\$390 billion (~13% of GDP) to treat diseases indirectly caused by coal burning (Dummer & Cook 2007). Alongside anticipated structural changes will lead China towards a less energy-intensive economic model, the implementation of air quality and energy policies in the New Policies Scenario would further lead to a significant reduction in emissions over the period to

¹ <https://www.who.int/airpollution/en/>

² <https://webstore.iea.org/weo-2016-special-report-energy-and-air-pollution>

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2040: SO₂ emissions fall by almost 30% and NO_x and PM_{2.5} by around 40% to minimize air pollution related premature deaths.³

4. In Hong Kong, The Air Pollution Control Ordinance (Cap. 311) sets out Air Quality Objectives (AQOs) to closely monitor seven major air pollutants (SO₂, NO₂, O₃, CO, VOC, PM_{2.5} & PM₁₀). Under the Ordinance, the Secretary for the Environment is required to review the AQOs at least once in every five years and submit a report of the review to the Advisory Council on the Environment (ACE). The last AQOs review was conducted in 2014 and therefore 2019 would be a critical year before the next review in 2024.⁴

5. In the new improvement measures proposed by ENB, FoE (HK) would like to focus on two major pollutants, NO₂ and PM_{2.5}.

6. NO₂ mainly comes from fuel combustion. Long term exposures would irritate airways in the human respiratory system which could aggravate existing chronic respiratory diseases. With a 40 µg/m³ annual limit, data from EPD has been extracted to compare this pollutant status during the past 3 years.

Number of Stations meeting the Annual Limit Value (Total = 16)

	Below Limit Value	Exceed Limit Value	Passing Rate
2016	5	11	31.25%
2017	6	10	37.5%
2018	7	9	43.75%

Top 5 Districts with Highest NO₂ (Annual Limit Value = 40 µg/m³)

	1 st Highest	2 nd Highest	3 rd Highest	4 th Highest	5 th Highest
2016	Causeway Bay 89 µg/m ³	Central 78 µg/m ³ Mongkok 78 µg/m ³	Kwai Chung 59 µg/m ³	Sham Shui Po 58 µg/m ³	Tsuen Wan 56 µg/m ³
2017	Causeway Bay 97 µg/m ³	Central 81 µg/m ³	Mongkok 80 µg/m ³	Kwai Chung 57 µg/m ³	Sham Shui Po 54 µg/m ³
2018	Causeway Bay 87 µg/m ³	Central 80 µg/m ³	Mongkok 79 µg/m ³	Kwai Chung 55 µg/m ³	Sham Shui Po 49 µg/m ³

³ <https://webstore.iaea.org/weo-2016-special-report-energy-and-air-pollution>

⁴ https://www.epd.gov.hk/epd/english/environmentinhk/air/air_quality_objectives/aqoreview2016.html



From Year 2016-2018, it is apparent that the measures taken to minimize NO₂ were insufficient. The top 5 districts being most heavily polluted with NO₂ remains the same: Causeway Bay, Central, Mongkok, Kwai Chung and Sham Shui Po. NO₂ concentrations in Causeway Bay (~90 µg/m³), Central (~80 µg/m³) and Mongkok (~80 µg/m³) consistently **doubled** the limit value in the past three years. All these observations point to the need for improvement.

7. Particulate matter (PM) is a term used to describe the mixture of solid particles and liquid droplets in the air. Fine suspended particulates (FSP / PM_{2.5}) means the mass per cubic meter of air of particles with a size (diameter) generally less than 2.5µm. The biggest impact of particulate air pollution on public health is the increase in the age-specific mortality risk, particularly from cardiovascular causes. In this AQO review, EPD intends to, on one hand, tighten the PM_{2.5} concentration for both the 24-hour limit and the annual limit. On the other, loosen the number of allowable exceedances, from 9 times to 35 times. Data were again analyzed from the 2016 to 2018 EPD air quality reports.⁵ Results indicated that with the proposed new improvement measures, it is unnecessary to loosen the “Number of Exceedances” even if we tighten the hour limit value from 75 to 50 µg/m³.

⁵ Air Quality in Hong Kong 2017, EPD

Current : PM2.5 24 hour limit value = $75 \mu\text{g}/\text{m}^3$; allowable no. of exceedance = 9

Proposed : PM2.5 24 hour limit value = $50 \mu\text{g}/\text{m}^3$; allowable no. of exceedance = 35

2016	# of Exceedance $75 \mu\text{g}/\text{m}^3$	# of Exceedance $50 \mu\text{g}/\text{m}^3$
Tsuen Wan	0	>10
Yuen Long	1	>10
Tuen Mun	2	>10
Tung Chung	2	>10
Tai Po	0	>10
Causeway Bay	2	>10
Mongkok	0	>10
Central/Western	0	9
Kwun Tong	0	9
Central	0	9
Kwai Chung	0	8
Eastern	0	6
Sham Shui Po	0	6
Sha Tin	0	5
Tap Mun	0	4
Tseung Kwan O	0	1

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2017	# of Exceedance 75 µg/m ³	# of Exceedance 50 µg/m ³
Causeway Bay	4	>10
Tsuen Wan	3	>10
Tuen Mun	3	>10
Yuen Long	2	>10
Tung Chung	2	>10
Sha Tin	1	>10
Central	1	>10
Mong Kok	1	>10
Central/Western	0	>10
Eastern	0	>10
Kwun Tong	0	>10
Tai Po	0	>10
Kwai Chung	0	8
Sham Shui Po	0	4
Tseung Kwan O	0	4
Tap Mun	0	1

2018	# of Exceedance 75 µg/m ³	# of Exceedance 50 µg/m ³
Tuen Mun	2	>10
Mong Kok	2	>10
Causeway Bay	1	>10
Central	1	8
Tung Chung	2	7
Central/Western	2	6
Tsuen Wan	2	6
Yuen Long	1	5
Kwun Tong	0	5
Tai Po	0	5
Sha Tin	0	3
Eastern	0	2
Sham Shui Po	0	2
Kwai Chung	0	2
Tseung Kwan O	0	1
Tap Mun	0	1

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From tables above, there were 7, 12 and 3 monitoring stations recording a PM_{2.5} exceedance of 50 µg/m³ in year 2016, 2017 and 2018, respectively. With more stringent pollution control, it is apparent that the PM_{2.5} concentrations would be lowered. In this connection, it seems unnecessary to loosen the number of exceedances from 9 times to 35 times. Given that less exposure (75 µg/m³ to 50 µg/m³; 9 than 35) is better for community health, it is unwise to loosen the standards at this juncture. In assessing health impacts to the community, both the dose and duration matters. In this regard, only tightening the pollutant concentrations is not sufficient to protect our population health. We also need to minimize our exposure to pollutants. With the proposed loosening of permitted exceedances for PM_{2.5}, it is anticipated that our illness episodes, hospital admissions and mortality would increase.

8. In July 2018, Professor Anthony Hedley's team from HKU School of Public Health presented to the Legislative Council's Environmental Affairs Panel (EA Panel), reporting that over 3,000 Hong Kong people died prematurely due to air pollutants and 151,300 were hospitalised for pollution-related illnesses in 2017. The medical bills and the value of loss of productivity were estimated at HK\$39.4 billion.⁶

⁶ Hedley Environmental Index - http://hedleyindex.hku.hk/outcome_cost?lang=en



Our Advocates

To minimize the burden of community costs of air pollution and avoiding more sick population and premature deaths, we suggest ENB to work closely with the Food and Health Bureau (FHB) to better monitor and evaluate air pollution related health problems in:

- a. identifying air pollution related diseases and construct databases on its incidence, prevalence, morbidity and mortality;
- b. facilitating studies on air pollution related health impacts;
- c. collaborating with Hospital Authority (HA) on diseases monitoring and surveillance;
- d. conducting comprehensive bronchial hyperresponsiveness tests for priority populations including juveniles, maternal and elderly to evaluate effectiveness of pollution control;⁷
- e. collecting health statistics from China to construct simulation model in air pollution control to better estimate health impacts;
- f. working closely with the HK Observatory on the impact of weather conditions and climate change as it is already evident that oxidant pollutants exert stronger health effects in cool seasons;^{8,9}
- g. improving risk communications on air quality for government officials, law makers, NGOs, and the general public, especially the most sensitive and vulnerable population
- h. encouraging physical activity of citizens for a better healthier body

Friends of the Earth (HK) wishes the Government to adopt urgent specific actions in reducing air pollutant emissions (both in concentrations and exposures) with an aim to protect our population health. It is of no doubt that our healthcare system is severely under stress, more stringent measures in improving our air quality should be implemented.

Friends of the Earth (HK)

October 10th 2019

⁷ C M Wong, T H Lam, J Peters, A J Hedley, S G Ong, A Y C Tam, J Liu, D J Spiegelhalter. Comparison between two districts of the effects of an air pollution intervention on bronchial responsiveness in primary school children in Hong Kong. *J Epidemiol Community Health* 1998;52:571-578.

⁸ T W Wong, Y T Wun, T S Yu, W Tam, C M Wong, A H S Wong. Air pollution and general practice consultations for respiratory illnesses. *J Epidemiol Community Health* 2002;56:949-950.

⁹ C M Wong, S Ma, A J Hedley, T H Lam. Effect of air pollution in daily mortality in Hong Kong. *Environ Health Perspect* 2001;109:335-340.

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