Dr Hon Junius Kwan-yiu HO, JP
Chairman, Panel on Environmental Affairs
Legislative Complex, 1 Legislative Council Road, Central, Hong Kong

22nd March, 2019

Dear Dr. Ho,

"Review of Hong Kong's Air Quality Objectives (AQOs)"

1. After 25 years, the revision of Hong Kong' AQOs in 2012 (effective 2014) from the original AQOs set in 1987 was a major step forward in air quality management in Hong Kong. The subsequent Clean Air Plan introduced in 2013 has led to significant and substantial improvement of air quality (as reflected by the reduction of NO_2, SO_2, PM_{10} and $PM_{2.5}$ concentrations) and the reduction of both short-term and long-term health risks for the public in Hong Kong.

2. More importantly, the introduction of a regular review mechanism in the APCO ensures that the government will work with stakeholders every 5 years to review and progressively tighten our AQOs towards the WHO AQGs, and to develop additional control policies to further protect public health, instead of possibly waiting for another 25 years.

3. This first round of review of AQO under the revised APCO is particularly important as it sets a precedent on the way the review is conducted, and some of its guiding principles. We believe the guiding principle should be a progressive "health-led" approach in the revision of AQOs.

4. Under a "health-led" principle, we should progressively tighten pollutant objectives that have already been achieved, unless they are already at AQG levels, and then determine the policies that are needed to achieve improved objectives. For pollutants that are not in compliance, the existing objective levels should be kept, and the focus should be on identifying and implementing policies that would lead to compliance of these pollutants.

5. Hence we support the current proposed revision of AQOs for 24-hour average SO_2 from 125 $\mu g/m^3$ (IT1) to 50 $\mu g/m^3$ (IT2), the revision of 24-hour average $PM_{2.5}$ from 75 $\mu g/m^3$ (IT1) to 50 $\mu g/m^3$ (IT2) and annual average $PM_{2.5}$ from 35 $\mu g/m^3$ (IT1) to 25 $\mu g/m^3$ (IT2).

6. There is concern raised, during the AQO review working group meetings, that the lowering of $PM_{2.5}$ 24-hour standard is associated with an increased number of exceedances from 9 to 35, and that this increase in exceedances may lead to less protection of public health. **We DO NOT share or agree with this concern.**

7. Quoting directly from the WHO Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide – Global update 2005: *"When evaluating the WHO AQGs and interim targets, it is generally recommended that the annual average take precedence over the 24-hour average since, at low levels, there is less concern about episodic excursions."*

8. In other words, the WHO note that **it is "generally" better to be able to lower the annual average targets, even at the expense of allowing more exceedances at the lower 24-hour average for the *same* interim target.** This is because of (i) the much larger disease burden of the annual average than the 24-hour average, and (ii) the nature of air pollution variations is such that the lowering of the annual average generally implies the lowering of *all percentiles* so there is little chance of the lowering of annual average target would lead to an increase health risk for the public. The WHO acknowledged that the corresponding lowering of the 24-hour average at the same interim target could lead to more exceedances, but noted that "*at low levels, there is less concern about episodic excursions*."

9. We also note that the EU sets the standard for annual average $PM_{2.5}$ (at 25 μg/m^3, the same as the current AQO review proposal), but doesn't have a 24-hour average standard for $PM_{2.5}$.

10. There is also concern that the current AQO review does not propose the lowering of the ozone standard. **However, since we are still not in compliance with the 8-hour ozone objective, we believe the focus should be on identifying and implementing control policies that can bring ozone into compliance of the current standard, rather than to lower the existing ozone AQO**.

11. Controlling precursors (NOx and volatile organic compounds, VOCs) are critical for reducing ozone. Moreover, since Hong Kong is in a VOC-limited region for ozone formation, the focus should be on identifying VOC control policies that can help lower ozone concentrations. Unfortunately, our understanding of VOC is also very limited, and hence it is difficult for the AQO review working groups to identify and prioritize VOC control policies that can help reduce ozone. **What we urgently need is to enhance our understanding of VOCs (in term of both the VOC emission inventory, and the ambient VOC concentrations) before we can decide which policy would be more effective for controlling the reactive VOCs and ozone.** Furthermore, studies showed that the ozone problem is much more a regional problem, the government must leverage the enhanced collaboration under the Greater Bay Area framework to work with Guangdong and Macau to identify and develop more targeted and effective VOC and ozone control policies.

12. Related to this, the current review has identified a number of data and knowledge gaps (e.g. sources and ambient concentrations of reactive VOCs, emission impacts for different traffic policies, updated health and economic data for impact analyses, etc.). **The government must (i) take stock of the data and knowledge gaps identified in this review, and (ii) make sure that studies be done and data connections be sorted out, such that these data and required knowledge are available BEFORE the start of the next review**, so that the next AQO review team would be in a better position to discuss what policies can be effective in improving our air quality next time around.

13. **The identification of knowledge gaps in one review and the rectification of these gaps BEFORE the next review should be a formal and integral part of new on-going AQO review process**. This is the only way to make sure we can continue to improve air quality and protect public health through a progressive AQO review process.

Sincerely,

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