

To:

Honourable Members of the Panel on Environmental Affairs,
Legislative Council,
Hong Kong Special Administrative Region of the People's Republic of China,
Legislative Council Building,
8 Jackson Road, Central,
Hong Kong

6 October 2009

Re: the Administration's proposal to update the Air Quality Objectives (AQOs)

Dear Honourable Members:

The primary purpose of the AQOs should be for protection of public health, and adopting the World Health Organization's Air Quality Guidelines (AQGs) as our AQOs is the best way to do it. Rather than taking this 'target-driven' approach, the consultant has chosen the proposed set of AQOs from a 'feasibility-driven' approach, suggesting that this is the best we can do in the near term.

I do not agree with this in principle; as for protection of public health, the AQOs should be the driver for control policies, and not the other way around. A lot of measures proposed in Phase II (e.g. reduce parking provision, electronic road pricing, congestion charging scheme, emission control for marine vessels, etc) have little or no technical barrier; they are perceived to be not feasible in the short term because of political rather than technical concerns. **A target-driven approach provides the much needed political pressure to pursue the difficult issues to improve our air quality but a feasibility-driven approach does not.**

A case in point is sulphur dioxide (SO₂). The proposed AQO for daily averaged SO₂ is 125 µg/m³ (IT-1). However, data from EPD for 2007-2009 clearly shows that high concentrations of SO₂ in Hong Kong are mainly related to marine emissions within Hong Kong waters, and the adoption of SO₂ port emission control measures similar to those already done in other ports (e.g., port of Los Angeles) should significantly reduce SO₂ concentrations in Hong Kong to be within the IT-2 daily averaged SO₂ target of 50 µg/m³ (see appendix for the analysis).

Hence, **even from a feasibility driven approach, the AQO for 24 hour SO₂ should be set as IT-2 or 50 µg/m³.** Since the AQO is linked with the Environmental Impact Assessment (EIA) process, the loose AQO currently proposed removes the justification the government needed to push for a technically feasible clean port policy for air quality improvements.

I applaud the recommendation of a regular review mechanism for the AQO. **However, the omission of a clear timeline for (a) the achievement of the proposed AQOs, or (b) the eventual adoption of the WHO AQGs is a fundamental flaw in the proposal.** Where is the drive if there is no timeline? The proposed AQOs is already weak compared with the WHO AQGs, **the lack of a timeline suggests that Hong Kong dare not envision a time when our air quality will improve and not be harmful to public health.** It also sets a terrible precedent for future AQO reviews and severely limit their effectiveness in improving air quality in Hong Kong.

Submitted by

Alexis Kai-Hon Lau

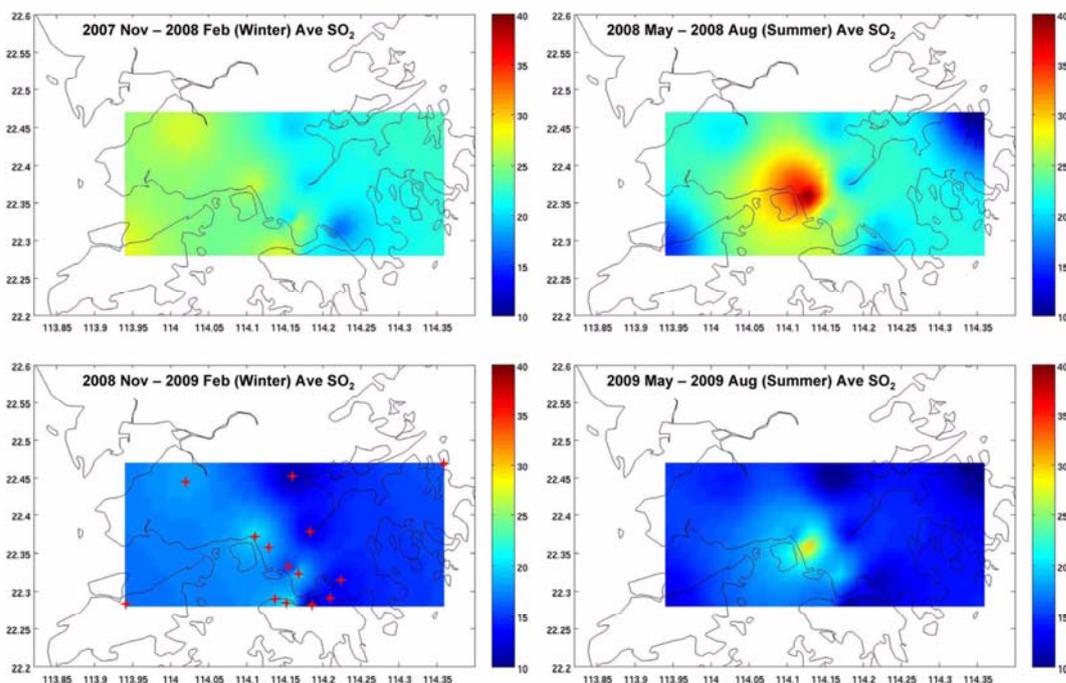
Institute for the Environment

The Hong Kong University of Science and Technology

Appendix: SO₂ pollution in Hong Kong

Many people believe that Hong Kong's air quality problems are mainly related to the transport of pollutants from the mainland China into Hong Kong. While this is true for some of the pollutants (e.g. ozone and particulate matters), this is not true for sulphur dioxide (SO₂) and nitrogen dioxide (NO₂), which are more related to marine and on-road vehicular emissions, respectively.

The following figure show the concentration of SO₂ interpolated over Hong Kong using data from EPD Air Quality Monitoring Stations (AQMS, shown in red in the lower left panel). The top panels show the winter (left) and summer (right) SO₂ concentration before the economic downturn in October 2008, and the low panels show the corresponding concentrations after the enforcement of the mandatory use of Ultra Low Sulphur Diesel (ULSD) in industrial and commercial processes (including port areas) and the economic downturn in October 2008. The colour scales of the figures are the same, with hotter colour denoting higher concentrations.



These figures show that the concentration of SO₂ over Hong Kong is

- (i) higher during the summer (when the wind is mainly southerly),
- (ii) the peak values of SO₂ are observed near Kwai Chung and Tsuen Wan, next to the container port terminal,
- (iii) the average SO₂ concentration drop about 25% after the economic downturn.

The fact that we have higher SO₂ concentration during the summer when the wind is mainly southerly suggest that the pollution source is local rather than regional, and the high values next to the container terminal points to the significance of emissions from marine shipping. Marine shipping signature is very prominent.

We also found that there was about 15% drop in the number of container ships into Hong Kong before and after the economic downturn. This drop in vessel number, together with the mandatory use of ULSD in commercial and industrial processes (including port activities), were apparently responsible for an overall drop of about 25% in SO₂ concentration.

We note that ocean-going ships currently uses residual fuel oil with up to 2.5% Sulphur. A reduction of sulphur content to 0.5%, as required by the port of Los Angeles, will have the SO₂ emission cut down by 80%. This is a very significant number. We expect that the impact of similar regulation in Hong Kong would result in a similarly large reduction impact for SO₂ over Hong Kong.

Finally, we note from EPD data that there was no exceedence of the proposed daily SO₂ standard (IT-1) in 2007, two exceedances in 2008, and no exceedence up to 2009. This means that, without a further tightening of the SO₂ standard to IT-2, there is little basis for further control of SO₂ in the marine sector even though we know that the SO₂ fumes from marine sources is posing significant health threat to the population.