

**Air Quality Objectives Review**  
**Public Consultation**

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### Executive Summary

Child Welfare Scheme, the School of Public Health and Primary Care (CUHK), the Hong Kong Transition Project (HKBU), the Centre for Comparative and Public Law (HKU), Oldham, Li & Nie (OLN) and Clean Air Foundation (CAF) submit in response to the public consultation on the air quality objectives review as follows:

- (1) We agree that the existing air quality objectives need updating, as the present AQOs are over 20 years old and incapable of protecting the health of the people of Hong Kong, particularly the children of Hong Kong.
- (2) We agree that protection of public health should be the key consideration in updating the AQOs. Health concerns are the reason most children surveyed complain about air pollution. Not only should public health be protected according to the purpose of the Air Pollution Control Ordinance, but public health is also required to be protected by the right to health. Children's health, in particular, is protected under the United Nations Convention on the Rights of the Child, and the United Nations Committee on the Rights of the Child have in fact addressed the detriment air pollution causes to children's health in other countries. Local and international studies show that air pollution causes DNA damage to children in utero, damages the development of children's lungs, reduces the lung function and physical performance of children, and is related to higher rates of hospitalization. The effectiveness of personal measures to protect health against the effects of air pollution is limited, but as a local intervention to restrict sulphur content in fuel shows, even modest air quality interventions by the Government can bring about improvements in the health of children.
- (3) We agree that a staged approach should be taken to air pollution control in Hong Kong. A significant number of children surveyed believe that the World Health Organisation should set Hong Kong's AQOs, and we agree that the AQOs should be set with reference to the World Health Organisation Air Quality Guidelines. However, we do not agree that the Interim Targets should be substituted for the WHO AQGs as under the laws relating to air pollution in Hong Kong, the AQOs appear to be long term goals, and the Interim Targets still represent levels of air pollution at which some prejudice to health may occur.
- (4) We therefore do not agree with the proposed new AQOs, which were set with reference to a combination of WHO AQGs and Interim Targets. We note that in the case of some pollutants, the AQOs have been set higher than the highest levels of those air pollutants we experience in Hong Kong.

- (5) We agree that there should be a mechanism for reviewing the AQOs at regular intervals; this is required under the human right and child right to the progressive attainment of the highest standard of health. If the WHO's AQGs are all adopted, then the updating exercise would simply follow the WHO's updates to their AQGs.
- (6) Given that the majority of children surveyed do not believe their complaints about air pollution will do any good, we commend the detailed emission control measures proposed by the Government. We are concerned that because of the decentralized nature of air pollution regulation in Hong Kong, it may be difficult to implement these measures without clear co-ordination of the relevant Government authorities and departments. We would also like to put forward for consideration that measures which reduce the exposure of children to air pollution in order to protect their health should be developed, especially in light of the medical evidence of the damage air pollution causes to children's health.
- (7) We believe that the emission control measures need to be implemented as soon as possible due to the ongoing damage air pollution is causing to children's health.
- (8) We believe that the costs of implementing the emission control measures should be borne by polluters and the population on a proportionate and equitable basis. We comment that given the speed at which Hong Kong society has adapted to the ban on indoor smoking and the tax on plastic bags, the people of Hong Kong are prepared to accept adjustments to their way of life for the sake of their health and the environment.

Each of the organizations has made a contribution to these submissions. We believe air pollution is a problem that affects people from all walks of life, and is a multi-faceted problem that calls for a multi-disciplinary understanding. Each of the organizations has made their contribution to these submissions because of their concern in respect of the effect of air pollution on the health of children in Hong Kong.

We thank the Government for this opportunity to present the issues we feel are relevant to the issue of air quality in Hong Kong, and attach to our submissions the results of Child Welfare Scheme's survey of how children feel about air pollution, so that their views may also be considered.

### Submissions

Thank you for this opportunity to present issues of concern in respect of the air quality in Hong Kong.

It may be appropriate for the parties to this document to first be introduced.

Child Welfare Scheme is a Hong Kong registered charity dedicated to supporting children through education, health care and social opportunities. CWS started its life-saving work in 1995 and all programmes to date have been in Nepal. The community of Hong Kong is always supportive of CWS' work. For the past few years, the CWS team has wanted to give something back to Hong Kong for its generous support. Due to a growing concern about the state of Hong Kong's air and the threat it poses to children's health, CWS has initiated its first programme outside Nepal: an education campaign about how Hong Kong's air pollution affects the health of children living here. As part of this campaign, CWS recently conducted a pilot survey of students in Hong Kong aged 11 – 18, the results of which are included in this document.

The Chinese University Hong Kong's School of Public Health and Primary Care shares a common goal with CWS – that of tackling the air pollution issue, and thereby improving the health of Hong Kong residents. As part of a leading university in the region, the School aims to deal with the problem primarily through education: raising awareness, improving knowledge, and ultimately changing attitudes towards air pollution and health.

The Hong Kong Transition Project has tracked public views toward government and reforms from the establishment of District Boards (1982) to the first direct elections to the Legislative Council (1991) and the first contested election for Chief Executive (2007).

The Centre for Comparative and Public Law was established within the Faculty of Law of the University of Hong Kong in mid-1995. Its goals are to promote research in the fields of public and comparative law, and to disseminate the results of that research through publications and making materials available on-line. The Centre's research projects include the international law implications of the resumption of Chinese sovereignty in 1997, including the Hong Kong treaty project, immigration law and practice, equality and the law in Hong Kong, the Hong Kong Bill of Rights, human rights protection under the Basic Law and international human rights law.

Oldham, Li & Nie are a mid-sized law firm in Hong Kong specialising in commercial work, dispute resolution and intellectual property.

Appalled by the dangerous and rising levels of high pollution in Hong Kong, Clean Air

Foundation, a non-profit organization, was formed to provide protection of the environmental rights of current and future generations of Hong Kong, in particular every citizen's right to breathe clean air.

The coming together of these groups to contribute their views to this consultation reflects both the fact that the air pollution problem in Hong Kong touches people from all walks of life, and also reflects the multi-faceted nature of the problem, which requires a multi-disciplinary approach in order to be fully understood.

The concern shared by these groups in the context of air pollution is the detrimental effect air pollution has on children's health. The views of these groups expressed herein are thus directed at the protection of children's health from the effects of air pollution.

Turning now to the key consultation points:

***Question (1): Do you agree that the existing Air Quality Objectives (AQOs) need updating?***

Yes.

The current AQOs in force in Hong Kong were established in 1987; whilst it is clear that the science on which those AQOs were established must now be out of date, in fact the element of 'prejudice to health' was not introduced into the Air Pollution Control Ordinance (Cap 311) until 1993, under the Air Pollution Control (Amendment) Ordinance 1993 (13 of 1993), meaning that the AQOs may not even have taken medical science into account.

The fact that the current AQOs have not been updated since 1987 means that they are now substantially higher than the levels of air pollution concentration recommended under the World Health Organisation's Air Quality Guidelines. It is clear that the current AQOs are incapable of protecting health.

***Question (2): Do you agree that protection of public health should be the key consideration in updating the AQOs?***

Yes; protection of health is required by the laws of Hong Kong and needed in view of the damage air pollution is causing to public health in Hong Kong, particularly children's health.

The purpose of the Air Pollution Control Ordinance as set out in the Long Title is:

**To make provision for abating, prohibiting and controlling *pollution of the atmosphere* and for matters connected therewith.** (emphasis added)

‘Pollution of the atmosphere’ is not defined by the Ordinance; however, a similar term – ‘air pollution’ – is defined in s. 2 (again emphasis added):

**An emission of air pollutant which either alone or with another emission of air pollutant –**

- (a) *Is prejudicial to health;***
- (b) *Is a nuisance;***
- (c) *Imperils or is likely to imperil the safety of or otherwise interferes with the normal operation of aircraft; or***
- (d) *Is determined to be air pollution under a technical memorandum.***

Whilst the terms ‘pollution of the atmosphere’ and ‘air pollution’ are not identical, they should be read as equivalent for the purposes of interpreting the Ordinance. The intent of the Air Pollution Control Ordinance is therefore:

**To abate, prohibit and control the emission of pollutants that are prejudicial to health.**

Moreover, the right to health is constitutionally guaranteed. Under Article 39 of the Basic Law, the provisions of the International Covenant on Economic, Social and Cultural Rights shall remain in force and be implemented through the laws of Hong Kong. This includes the right to health under Article 12:

- 1. The States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health.**
  - 2. The steps to be taken by the States Parties to the present Covenant to achieve the full realization of this right shall include those necessary for:**
    - (a) The provision for the reduction of the stillbirth-rate and of infant mortality and for the healthy development of the child;**
    - (b) The improvement of all aspects of environmental and industrial hygiene;**
- ...

Furthermore, the United Nations Convention on the Rights of the Child also applies to the Hong Kong Special Administrative Region following the resumption of sovereignty by China. Similar obligations are set out under Article 24:

1. **States Parties recognize the right of the child to the enjoyment of the highest attainable standard of health and to facilities for the treatment of illness and rehabilitation of health. States Parties shall strive to ensure that no child is deprived of his or her right of access to such health care services.**
  
2. **States Parties shall pursue full implementation of this right and, in particular, shall take appropriate measures:**
  - (a) **To diminish infant and child mortality;**
  - (b) **To ensure the provision of necessary medical assistance and health care to all children with emphasis on the development of primary health care;**
  - (c) **To combat disease and malnutrition, including within the framework of primary health care, through, inter alia, the application of readily available technology and through the provision of adequate nutritious foods and clean drinking-water, taking into consideration the dangers and risks of environmental pollution;**
  - (d) **To ensure appropriate pre-natal and post-natal health care for mothers;**
  - (e) **To ensure that all segments of society, in particular parents and children, are informed, have access to education and are supported in the use of basic knowledge of child health and nutrition, the advantages of breastfeeding, hygiene and environmental sanitation and the prevention of accidents;**
  - (f) **To develop preventive health care, guidance for parents and family planning education and services.**

...

The achievement of these obligations was emphasised in *Clean Air Foundation Limited & Anor v Government of the HKSAR* by Hartmann J (as he then was). Specific reference was made in the judgment to Article 12 of the International Covenant on Economic, Social and Cultural Rights (ICESCR). Whilst the application for judicial review in that case was dismissed, the reason for the dismissal was that the remedies sought were matters of policy rather than law. The connection between the right to health and air pollution in that judgment, however, is clear.

This connection is also made clear by the United Nations Committee on the Rights of the Child. In their consideration of the reports submitted by State parties, such as Slovakia (in 2000), South Africa (in 2000), Jamaica (in 2003), Philippines (in 2008), the Committee made a note of concerns in respect of air pollution in the context of children's health, usually recommending measures be taken, increased or intensified to combat the threat to children's health caused by environmental pollution.

Furthermore, as was recently reported by Dr Helen Tinsley and Professor AJ Hedley to the Panel on Constitutional Affairs<sup>1</sup>, local and international studies demonstrate the following in respect of air pollution's effect on child health:

- Air pollution induces DNA damage in children before birth during pregnancy and affects both mother and baby through the fetal-maternal circulation<sup>2</sup>.
- Air pollution induces pathophysiological damage to the developing lung in children and adolescents<sup>3</sup>.
- There is evidence in Hong Kong children of reduced maximal oxygen uptake during exercise in Kwun Tong leading to impairment of physical performance during sports activities<sup>4</sup>.
- Air pollution (NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, O<sub>3</sub>) in Hong Kong increases paediatric asthma admissions to hospital<sup>5</sup>.
- In Hong Kong high concentrations of air pollutants (NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, O<sub>3</sub>) are related to higher excess risks of mortality<sup>6</sup> and hospitalization<sup>7</sup>, mainly from cardiopulmonary disease. Those in lower socio-economic groups are most affected<sup>8</sup>.

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<sup>1</sup> Submission on 18 May, 2009

<sup>2</sup> Salvi S. Health effects of ambient air pollution in children. *Paediatric Respiratory Reviews* 2007; 8:275-80

<sup>3</sup> Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D, Peters J. The effect of air pollution on lung development from 10 to 18 years of age. *New England Journal of Medicine* 2004; 351:1057-67

<sup>4</sup> Yu TS, Wong TW, Wang XR, Song H, Wong SL, Tang JL. Adverse effects of low-level air pollution on respiratory health of school children in Hong Kong. *Journal of Occupational and Environmental Medicine* 2001; 43:310-16

<sup>5</sup> Ko FWS, Tam WS, Wong TW, Lai CKW, Wong GWK, Leung TF, Ng S, Hui DSC. Effects of air pollution on asthma hospitalization rates in different age groups in Hong Kong. *Clinical and Experimental Allergy* 2007; 37:1312-1319; Lee SL, Wong WH, Lau YL. Association between air pollution and asthma admission among children in Hong Kong. *Clinical and Experimental Allergy* 2006; 36:1138-46

<sup>6</sup> Wong TW, Tam WS, Yu TS, Wong AHS. Associations between daily mortalities from respiratory and cardiovascular diseases and air pollution in Hong Kong, China. *Occup Environ Med* 2002; 59:30-35; Wong CM, Ma S, Hedley AJ, Lam TH. Effect of air pollution on daily mortality in Hong Kong. *Environmental Health Perspectives* 2001; 109: 335-40

<sup>7</sup> Wong TW, Lau TS, Yu TS, Neller A, Wong SL, Tam W, Pang SW. Air pollution and hospital admissions for respiratory and cardiovascular diseases in Hong Kong. *Occupational and Environmental Medicine* 1999;56(10): 679-683; Wong CM, Atkinson RW, Anderson HR, Hedley AJ, Ma S, Chau PYK, Lam TH. A tale of two cities: Effects of air pollution on hospital admissions in Hong Kong and London compared. *Environmental Health Perspectives* 2002; 110:67-77; Hedley AJ, Wong CM, Thach TQ, Ma S, Lam TH, Anderson HR. Cardiorespiratory and all-cause mortality after restrictions on sulphur content of fuel in Hong Kong: an intervention study. *The Lancet* 2002; 360:1646-52

<sup>8</sup> Wong CM, Ou CQ, Chan KP, Chau YK, Thach TQ, Yang L, Chung RYN, Thomas GN, Peiris JSM, Wong TW, Hedley AJ, Lam TH. The effects of air pollution on mortality in socially deprived urban areas in Hong Kong. *Environmental Health Perspectives* 2008; 116:1189-94



- International studies demonstrate that the lung function of children living within 500-1500 metres of major roads with high traffic volumes is reduced, which is consistent with local studies on the health of children exposed to pollution<sup>9</sup>. In Hong Kong because of the ‘canyon effect’ of buildings, air pollution concentrations measured in roadside monitoring stations are much higher than those measured in general stations and make a major contribution to population exposures.
- In Hong Kong children and their mothers living in polluted districts reported more respiratory symptoms and performed poorer in lung function tests. These findings have major implications for their future health and life expectancy<sup>10</sup>.

In Hong Kong there is strong evidence of health benefits of the 1990 regulation to restrict the sulphur content in fuel in July 1990. The benefits of the air quality intervention for children included reduction in cough, phlegm, sore throat, wheezing and nasal symptoms.<sup>11</sup> This is a clear demonstration that even modest air quality interventions government support and action can influence health of children. However air quality has deteriorated in several other respects since the 1990 intervention.

It should also be noted that, in accordance with the preliminary findings of a review of medical research published from 1980 to 2009 commissioned by Child Welfare Scheme from Chinese University's School of Public Health and Primary Care, the measures that can effectively be taken by individuals to protect their health from the effects of air pollution are very limited.

- One study showed a beneficial effect on heart rate changes among healthy adults who performed physical exercise wearing a N95 mask that reduced particulates inhaled. However, wearing a simple mask does not protect an individual from toxic gaseous pollutants.<sup>11</sup>
- Tests on N95 respirators showed they might not provide the expected degree of

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<sup>9</sup> Gauderman WJ, Vora H, McConnell R, Berhane K, Gilliland F, Thomas D, Lurmann F, Avol E, Kunzli N, Jerrett M, Peters J. Effect of exposure to traffic on lung development from 10 to 18 years of age: a cohort study. *Lancet* 2007; 369:571-7

<sup>10</sup> Peters J, Hedley AJ, Wong CM, Lam TH, Ong SG, Liu J, Spiegelhalter DJ. Effects of an ambient air pollution intervention and environmental tobacco smoke on children’s respiratory health in Hong Kong; Wong CM, Hu ZG, Lam TH, Hedley AJ, Peters J. Effects of ambient air pollution and environmental tobacco smoke on respiratory health of non-smoking women in Hong Kong. *International Journal of Epidemiology* 1999; 28:859-64; Wong CM, Lam TH, Peters J, Hedley AJ, Ong SG, Tam AYC, Liu J, Spiegelhalter DJ. Comparison between two districts of the effects of an air pollution intervention on bronchial responsiveness in primary school children in Hong Kong. *Journal of Epidemiology and Community Health* 1998; 52:571-8

<sup>11</sup> Langrish JP, Mills NL, Chan JKK, et al. Beneficial cardiovascular effects of reducing exposure to particulate air pollution with a simple face mask. *Particle and Fibre Toxicology* 2009; 6:8 (<http://www.particleandfibretoxicology.com/content/6/1/8>)

protection against small virus particles (10-80 nm),<sup>12</sup> and other nanoparticles (30-70 nm).<sup>13</sup>

- Air cleaners with high efficiency particulate filters have been advocated for the protection of allergic children. Results have so far been equivocal. A review of published studies in 2001 found no evidence of effectiveness of such air cleaners for people with inhalant allergic diseases.<sup>14</sup> Two randomized controlled trials – one among asthmatic adults who were sensitive to pet allergens, and another on asthmatic children living in an inner city, showed a beneficial clinical response of air cleaners (as the only intervention in the former study and one of several measures in the latter study).<sup>15</sup> The effect of air filters on indoor air pollutants other than allergens has not been studied.

The review clearly shows that individual efforts to reduce exposure to outdoor air pollutants are limited. Avoidance from outdoor activities on high pollution days appears to be the only feasible way to reduce exposure.<sup>16</sup>

As the results of a pilot survey conducted by Child Welfare Scheme shows, the only issue a majority (67%) of children expressed the highest level of concern about is air pollution, in contrast with other health issues such as drug abuse, swine flu, and unsafe food<sup>17</sup>.

The results of the survey also showed that clearly health of themselves or others is the concern for the majority of children who complain about air pollution. Moreover, over two thirds of children report themselves or family members having a variety of ailments frequently associated with air pollution<sup>18</sup>.

Given the clear association between air pollution and health (particularly children's health), the obligations set out both constitutionally and under the legislation, and the limited effectiveness of actions that can be taken by individuals to protect themselves from air

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<sup>12</sup> Balazy A, Toivola M, Adhikari A, et al. Do N95 respirators provide 95% protection level against airborne viruses, and how adequate are surgical masks? *American Journal of Infection Control* 2006; 34:51-57.

<sup>13</sup> Balazy A, Toivola M, Reponen T, et al. Manikin-based performance evaluation of N95 filtering-facepiece respirators challenged with nanoparticles. *Annals of Occupational Hygiene* 2006; 50(3):259-269.

<sup>14</sup> Reisman RE. Do air cleaners make a difference in treating allergic disease in homes? *Annals of Allergy, Asthma & Immunology* 2001; 87(Suppl):41-43; Sulser C, Schulz G, Wagner P, et al. Can the use of HEPA cleaners in homes of asthmatic children and adolescents sensitized to cat and dog allergens decrease bronchial hyperresponsiveness and allergen contents in solid dust? *International Archives of Allergy & Immunology* 2009; 148:23-30.

<sup>15</sup> Francis H, Fletcher G, Anthony C, et al. Clinical effects of air filters in homes of asthmatic adults sensitized and exposed to pet allergens. *Clinical & Experimental Allergy* 2003; 33:101-105; Eggleston PA, Butz A, Rand C, et al. Home environmental intervention in inner-city asthma: a randomized controlled clinical trial. *Annals of Allergy, Asthma & Immunology* 2005; 95:518-524

<sup>16</sup> Sattler B, Davis ADB. Nurses' role in children's environmental health protection. *Pediatric Nursing* 2008; 34(4):329-339.

<sup>17</sup> DeGolyer M. SAVE Children's Pilot Survey on Air Quality (attached), p 3-4

<sup>18</sup> DeGolyer M. SAVE Children's Pilot Survey on Air Quality (attached), pp 5-6

pollution, we conclude that the Air Quality Objectives should be set with the attainment of the highest standard of health in mind.

***Question (3): Do you agree that the AQOs should be set with reference to the guidelines and interim targets (ITs) published by the World Health Organisation (WHO) and that a staged approach be adopted to update the AQOs with a view to achieving the WHO Air Quality Guidelines (AQGs) as a long-term goal?***

We consider this to be two questions, rather than one. First, the Air Quality Objectives should be set with reference to the WHO's AQGs, but not the ITs. Secondly, we agree that a staged approach is called for in the regulation and management of air pollution in Hong Kong.

The obligations in respect of the constitutional right to health as set out above refer. As stated by Hartmann J in *Clean Air Foundation Ltd & Anor v The Government of the HKSAR* (unrep. HCAL 35/2007):

**Art.12, of course, looks to the *progressive achievement of the highest attainable standard of health*. Put simply, it recognises that Rome wasn't built in a day. But that being said, I accept that it must be *prima facie* arguable that it imposes some sort of duty on state authorities to combat air pollution even if it cannot be an absolute duty to ensure with immediate effect the end of all pollution.** (emphasis added)

The WHO's AQGs are recommended air quality standards for protecting public health, based on the latest scientific studies about the effects of pollutants, and are set at levels below which negative health effects have not been measured or are less certain. By contrast, the ITs represent levels at which reductions of negative health impacts still occur but are not entirely reduced; health is still prejudiced at these levels. Thus, in order to protect public health, the AQOs should be set in accordance with the WHO's AQGs.

At present the AQOs do not represent mandatory standards of air quality that must be attained. Under section 8 of the Air Pollution Control Ordinance:

...

**(2) The Authority shall aim to achieve the relevant air quality objectives as soon as is reasonably practicable and thereafter to maintain the quality so achieved.**

...

Thus, achievement is merely aimed at, and only after achievement is maintenance of the AQOs mandatory.

The AQOs are also not applied consistently throughout Hong Kong's air pollution regulation system. The main sources of air pollution in Hong Kong are from industry, transport and electricity generation<sup>19</sup>. The following tables illustrate the connection between the AQOs and the regulation of these sources of air pollution:

### **Marine emissions**

<b>Government Authority</b>	<b>Power</b>	<b>Ordinance/Regulation</b>	<b>Connection to AQOs</b>
Secretary for Environment	Makes rules on fuel content	Air Pollution Control Ordinance	No, "for the purposes of the Ordinance" instead
Secretary for Transport and Housing	Makes rules on fuel content	Merchant Shipping (Safety) Ordinance	No
Director of Marine	Issues Hong Kong Air Pollution Prevention Certificates	Merchant Shipping (Prevention of Air Pollution) Regulations	No
Director of Marine	Issues International Air Pollution Prevention Certificates	Merchant Shipping (Prevention of Air Pollution) Regulations	No
Marine Department and/or Police	Stop the crime of emitting smoke nuisance by vessels in Hong Kong waters	Shipping and Port Control Ordinance	No
Marine Department and/or Police	Stop the crime of emitting smoke nuisance by local vessels	Merchant Shipping (Local Vessels) Ordinance	No

### **Roadside emissions**

<b>Government Authority</b>	<b>Power</b>	<b>Ordinance/Regulation</b>	<b>Connection to AQOs</b>
Secretary for Environment	Makes rules on fuel content	Air Pollution Control Ordinance	No, "for the purposes of the Ordinance" instead
Environmental Bureau	Controls the sale of motor vehicle fuel	Air Pollution Control (Motor Vehicle Fuel) Regulations	No
Commissioner for Transport	Regulation and licensing of motor vehicles	Road Traffic Ordinance	No

<sup>19</sup> "Boomtown to gloomtown – The implications of inaction", CLSA – Christine Loh, James Paterson, September 2006, [http://www.civic-exchange.org/eng/upload/files/200609\\_ImplicationsInaction.pdf](http://www.civic-exchange.org/eng/upload/files/200609_ImplicationsInaction.pdf)

<b>Government Authority</b>	<b>Power</b>	<b>Ordinance/Regulation</b>	<b>Connection to AQOs</b>
Commissioner for Transport	Testing vehicle emission standards	Road Traffic Ordinance	No
Secretary for Environment	Setting vehicle emission standards	Air Pollution Control (Vehicle Design Standards)(Emission) Regulations	No
Transport and Housing Bureau	Prevent emission of smoke, fumes, vapour, sparks and grit from motor vehicles	Road Traffic Ordinance	No
Commissioner for Transport	Require construction and maintenance of motor vehicles prevent emission of excessive smoke or visible vapour	Road Traffic (Construction and Maintenance of Vehicles) Regulations	No
Commissioner for Transport	Exemption from first registration tax of environmentally friendly motor vehicles	Motor Vehicles (First Registration Tax) Ordinance	No

### **Emissions from electricity generation**

<b>Government Authority</b>	<b>Power</b>	<b>Ordinance/Regulation</b>	<b>Connection to AQOs</b>
Secretary for Environment	Allocation of emission allowances for specified licences	Air Pollution Control Ordinance	Yes, "for the purpose of attaining and maintaining"
Environmental Bureau	Regulation of emission allowances for specified licences	Air Pollution Control Ordinance	No

### **Ambient air quality controls**

<b>Government Authority</b>	<b>Power</b>	<b>Ordinance/Regulation</b>	<b>Connection to AQOs</b>
Environmental Protection Department	Issue air pollution abatement notice	Air Pollution Control Ordinance	No
Food and Environmental Hygiene Department	Issue nuisance notice for dust, fumes or effluvia	Public Health & Municipal Services Ordinance	No
Director of Environmental Protection	Grant or refuse environmental permit for designated projects	Environmental Impact Assessment Ordinance	Yes, "have regard to"

Though this is not a comprehensive review of all provisions relating to air pollution under the laws of Hong Kong, it can be seen that throughout most of the regulatory system for air pollution in Hong Kong, the AQOs are not applied or required to be applied. Even where they are applied, such as under the Environmental Impact Assessment Ordinance, there is no requirement for the achievement of the AQOs. In the premises, the AQOs currently represent long-term goals anyway, as there is no strict duty to attain them, and on that basis, there is little reason why the WHO's AQGs should not be adopted wholesale.

We note a significant level of belief among children who took the survey that the WHO should set AQO standards<sup>20</sup>

It should also be noted that under the Environmental Impact Assessment Ordinance and the Town Planning Ordinance there are requirements in respect of prejudice to health (under s 10 EIAO) and the promotion of the health of the community (under s 3 TPO) respectively that standards in respect of health are already established, and it is thus contradictory to set the AQOs against the ITs, which may still allow for levels of air pollution that prejudice health.

Setting the AQOs in accordance with the WHO's AQGs, however, does not preclude a staged approach with specific targets for each stage, working towards the achievement of the levels set by the WHO AQGs. Indeed, progressive achievement of the highest attainable standard of health seems to speak to such a staged approach.

***Question (4): Do you agree to the proposed new AQOs which have been set with reference to a combination of WHO AQGs and ITs?***

No.

Following on from our submissions above, it is a serious concern that the proposed sulphur dioxide concentration objective (125) appears to be higher than the highest concentration of sulphur dioxide currently measured in Mong Kok (114). Higher concentrations also appear to be proposed for carbon monoxide and lead.

Given the correlation between air pollution and health, these proposals are arguably inconsistent with the purpose of the APCO and the requirement of progressive achievement of the highest standard of health, by setting the AQOs at levels higher than they currently are.

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<sup>20</sup> DeGolyer M. SAVE Children's Pilot Survey on Air Quality (attached), p 8

A similar concern arises in respect of the proposed level for particulate matter, which appears to be so close to existing levels that it may not amount to a progressive achievement of a higher standard of health if the health impact such a reduction represents is negligible.

In the premises, we repeat our submission above in respect of the wholesale adoption of the WHO AQGs.

***Question (5): Do you agree that a mechanism should be put in place to regularly review the AQOs no less than every five years?***

Yes.

It has been noted above that the existing AQOs, now over 20 years old, are based on outdated science, and were potentially established without regard to public health.

As stated by Hartmann J:

**I do not see how it can be prima facie argued that s.7 is itself lacking. The section reads as follows:**

- “(1) The Secretary shall, after consultation with the Advisory Council on the Environment, establish for each air control zone air quality objectives or different objectives for different parts of a zone.**
- (1A) The Secretary may publish air quality objectives for an air control zone by issuing a technical memorandum which may specify different objectives for different parts of the zone.**
- (2) The air quality objectives for any particular air control zone or part thereof shall be the quality which, in the opinion of the Secretary, should be achieved and maintained in order to promote the conservation and best use of air in the zone in the public interest.**
- (3) Any air quality objective may be amended from time to time by the Secretary, after consultation with the Advisory Council on the Environment.”**

**As I read the section, it makes direct provision for the Secretary for the Environment, in consultation with a statutory body, not only to introduce air quality objectives but to update them whenever necessary.**

It is thus clear that under the Ordinance, updates to the AQOs are necessary.

If, as submitted above, the AQOs are set against the WHO’s AQGs, the updating process

becomes relatively simple in that all that is required is to keep abreast of the AQGs.

Furthermore, in addition to reviewing the AQOs, a review process should be put in place in respect of the attainment of the AQOs in order for such a review process to be meaningful and to assess the effectiveness of protection of health against air pollution.

***Question (6): To what extent do you agree that the proposed emission control measures set out in Chapter 6 should be implemented for achieving the new AQOs and improving local air quality in general? What other measures do you think the Government should consider?***

We commend the detailed set of proposed emission control measures set out in Chapter 6, as well as the measures proposed in the other phases of emissions control, particularly in light of the findings of Child Welfare Scheme's pilot survey of students. The percentage among adults, 61 percent who say they do not complain because they think it would do no good<sup>21</sup>, is close to the 51 percent of children who say they do not complain for the same reason<sup>22</sup>.

Three issues bear commenting upon in respect of the proposed emission control measures.

First, the tables in our response to Question (3) above refer. As emerges from those tables, it is clear that there is no one singular authority that is empowered to bring measures such as those proposed in Chapter 6 into force. We note that in his policy address, the Chief Executive stated that the Chief Secretary for Administration will co-ordinate the relevant work in respect of the proposed emission control measures<sup>23</sup>. In the short term, it may be necessary for the different authorities and Governmental departments to come to a number of memoranda of understanding in this regard, with a long-term view of streamlining the legislative and regulatory framework of air pollution management in Hong Kong.

Secondly, in making protection of health the key consideration in managing air pollution, it may be necessary to consider measures which reduce exposure to air pollution, rather than measures which are aimed at reducing air pollution generally.

Thirdly, and most importantly, following on from that, we submit that amongst the emission control measures proposed, there is insufficient consideration in respect of the most sensitive receivers of air pollution, such as children.

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<sup>21</sup> DeGolyer M. Hong Kong's Silent Epidemic – Public Opinion Survey 2008, December 2008, <http://www.civic-exchange.org/eng/upload/files/200901SilentEpidemic.pdf>

<sup>22</sup> DeGolyer M. SAVE Children's Pilot Survey on Air Quality (attached), p 5

<sup>23</sup> 2009 – 2010 Policy Address, para. 68



Referring back to the manifest evidence of the harm air pollution in Hong Kong causes to children's health:

- Air pollution induces DNA damage in children before birth and affects both mother and baby<sup>24</sup>.

The requirement under Article 24 of the United Nations Convention on the Rights of the Child (CRC) to ensure appropriate pre-natal care for mothers refers. No legal or regulatory measures currently exist for the fulfillment of this obligation, for example, to ensure that under the Air Control Zones, greater protection or higher standards is established for vulnerable parts of the population including hospitals and schools.

- Air pollution damages the developing lungs of children and adolescents<sup>25</sup>.

The requirement under Article 27 of the CRC to recognize the right of every child to a standard of living adequate for the child's physical development refers. The requirement to develop preventive healthcare under Article 24 also refers. As noted above, no legal or regulatory measures currently exist for the fulfillment of these obligations by providing greater protection for areas where there are high concentrations of children, for example schools and children's recreational facilities.

- In Hong Kong, children in two highly polluted districts – Kwun Tong and Yuen Long – suffer from reduced 'maximal oxygen uptake' (a measure of physical fitness) leading to an impairment of physical performance during exercise<sup>26</sup>.

The requirement under Article 23 of the CRC to recognize that physically disabled children should enjoy full and decent lives in conditions which facilitate the child's active participation in the community refers.

- Air pollution in Hong Kong increases paediatric asthma admissions to hospital<sup>27</sup>.

The requirement under Article 24 of the CRC to combat disease within the framework of primary health care and taking into consideration the dangers and risks of environmental pollution refers. The requirement to develop preventive healthcare in the same Article also refers. No legal or regulatory measures currently exist for the fulfillment of this obligation, for example, to enable the combating of asthma and other respiratory diseases associated with

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<sup>24</sup> Salvi S. Health effects of ambient air pollution in children

<sup>25</sup> Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D, Peters J. The effect of air pollution on lung development from 10 to 18 years of age

<sup>26</sup> Yu TS, Wong TW, Wang XR, Song H, Wong SL, Tang JL. Adverse effects of low-level air pollution on respiratory health of school children in Hong Kong

<sup>27</sup> Ko FWS, Tam WS, Wong TW, Lai CKW, Wong GWK, Leung TF, Ng S, Hui DSC. Effects of air pollution on asthma hospitalization rates in different age groups in Kong Hong. *Clinical and Experimental Allergy* 2007; 37:1312-1319; Lee SL, Wong WH, Lau YL. Association between air pollution and asthma admission among children in Hong Kong

air pollution.

- In Hong Kong high concentrations of air pollutants are related to higher excess risks of mortality<sup>28</sup> and hospitalization<sup>29</sup>, mainly from cardiopulmonary disease. Those in lower socio-economic groups are most affected<sup>30</sup>.

The requirement under Article 2 of the CRC that the rights set out in the CRC shall be respected and ensured irrespective of the child or the child's parents' property or other status refers. The requirements under Article 6 that recognize every child's inherent right to life and to ensure to the maximum extent possible the survival of every child also refer. The requirements in respect of combating disease, taking into consideration the dangers and risks of environmental pollution under Article 24 also refer. As noted above, no legal or regulatory measures currently exist for the fulfillment of these obligations to enable the combating of respiratory diseases associated with air pollution within the air pollution control framework.

- International studies demonstrate that the lung function of children living within 500-1500 metres of major roads with high traffic volumes is reduced, consistent with local studies on the health of children exposed to pollution<sup>31</sup>. In Hong Kong because of the 'canyon effect' of buildings, air pollution concentrations measured in roadside monitoring stations are much higher than those measured in general stations and make a major contribution to population exposures.

The requirement under Article 27 of the CRC to recognize the right of every child to a standard of living adequate for the child's physical development refers. Whilst certain provisions of the EIAO, most notably section 10, may cater for this requirement, it appears from the medical evidence that current legislation and regulations for example in respect of urban planning and environmental impact assessment are not sufficiently effective for the fulfillment of the requirements under Article 27.

- In Hong Kong children and their mothers living in polluted districts reported more

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<sup>28</sup> Wong TW, Tam WS, Yu TS, Wong AHS. Associations between daily mortalities from respiratory and cardiovascular diseases and air pollution in Hong Kong, China. *Occup Environ Med* 2002; 59:30-35; Wong CM, Ma S, Hedley AJ, Lam TH. Effect of air pollution on daily mortality in Hong Kong

<sup>29</sup> Wong TW, Lau TS, Yu TS, Neller A, Wong SL, Tam W, Pang SW. Air pollution and hospital admissions for respiratory and cardiovascular diseases in Hong Kong. *Occupational and Environmental Medicine* 1999;56(10): 679-683; Wong CM, Atkinson RW, Anderson HR, Hedley AJ, Ma S, Chau PYK, Lam TH. A tale of two cities: Effects of air pollution on hospital admissions in Hong Kong and London compared; Hedley AJ, Wong CM, Thach TQ, Ma S, Lam TH, Anderson HR. Cardiorespiratory and all-cause mortality after restrictions on sulphur content of fuel in Hong Kong: an intervention study.

<sup>30</sup> Wong CM, Ou CQ, Chan KP, Chau YK, Thach TQ, Yang L, Chung RYN, Thomas GN, Peiris JSM, Wong TW, Hedley AJ, Lam TH. The effects of air pollution on mortality in socially deprived urban areas in Hong Kong

<sup>31</sup> Gauderman WJ, Vora H, McConnell R, Berhane K, Gilliland F, Thomas D, Lurmann F, Avol E, Kunzli N, Jerrett M, Peters J. Effect of exposure to traffic on lung development from 10 to 18 years of age: a cohort study

respiratory symptoms and performed poorer in lung function tests. These findings have major implications for their future health and life expectancy<sup>32</sup>.

The requirement under Article 2 of the CRC that the rights set out in the CRC shall be respected and ensured irrespective of the child or the child's parents' property or other status refers. The requirements under Article 6 that recognize every child's inherent right to life and to ensure to the maximum extent possible the survival of every child also refer. The requirement under Article 27 of the CRC to recognize the right of every child to a standard of living adequate for the child's physical development also refers. As noted above, no legal or regulatory measures currently exist for the fulfillment of these obligations by providing greater protection for vulnerable parts of the population.

It is clear that the existing legal and regulatory framework for controlling air pollution in Hong Kong is inadequate for the fulfillment of the requirements under the CRC specifically to recognize the right of children to the enjoyment of the highest attainable standard of health and more generally, other requirements that are affected by air pollution. It is submitted that further measures need to be developed and considered as part of the emissions reduction measures to reduce the exposure of children to air pollution and thus protect them from its harmful effects.

***Question (7): How soon do you think these proposed emission control measures should be implemented?***

The current evidence available in Hong Kong in respect of the harm air pollution causes to health is based mostly on studying short-term effects, and may in fact underestimate the impact of air pollution on the population<sup>33</sup>. It is thus unclear whether or not the damage currently being sustained as a result of air pollution is reversible or not.

Nonetheless, we would submit that it is a matter of utmost urgency that steps be taken to reduce air pollution in Hong Kong, and to reduce the exposure of the population to air pollution in order to protect public health, and in particular, the health of children, as soon as possible.

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<sup>32</sup> Peters J, Hedley AJ, Wong CM, Lam TH, Ong SG, Liu J, Spiegelhalter DJ. Effects of an ambient air pollution intervention and environmental tobacco smoke on children's respiratory health in Hong Kong; Wong CM, Hu ZG, Lam TH, Hedley AJ, Peters J. Effects of ambient air pollution and environmental tobacco smoke on respiratory health of non-smoking women in Hong Kong. Wong CM, Lam TH, Peters J, Hedley AJ, Ong SG, Tam AYC, Liu J, Spiegelhalter DJ. Comparison between two districts of the effects of an air pollution intervention on bronchial responsiveness in primary school children in Hong Kong.

<sup>33</sup> "The impact of air pollution on population health, health care and community costs", Department of Community Medicine, HKU, submitted in respect of the review of Air Quality Objectives in Hong Kong on 27 November 2006

***Question (8): Are you willing to bear the costs arising from the implementation of the proposed emission control measures, such as higher electricity tariff and bus fares, as well as adjustments in your way of living?***

The costs of implementation per person or in respect of different types of lifestyle are not made clear in the consultation document. Nevertheless, given the very serious implications of air pollution on public health, we would venture to answer in the positive on the basis that those costs are borne proportionately on an equitable basis between the public at large and those responsible for the generation of air pollution, with particular regard to the transport and shipping sectors.

We note here in respect of the transport sector that a fair proportion of children either themselves or have observed in their family, various reactions to roadside pollution. At the very least the results of the pilot survey indicate a significant level of responses to traffic effects on children and their families. These effects may account for why, many respondents to the pilot survey cited reducing the number of trucks, cars and buses as means to reduce air pollution in Hong Kong.

It should also be noted that given the speed at which Hong Kong society has adapted to both the ban on indoor smoking and the tax on plastic bags, it is submitted that Hong Kong society is generally prepared to accept adjustments to the way of life in order to address health and environmental concerns.

***Question (9): Do you have any other views on the Review?***

We would like to thank you once again for this opportunity to present our views on air pollution, and hope that our submissions have been of assistance in this regard.

We attach herewith for your further perusal the report on the pilot survey commissioned by Child Welfare Scheme, which we have referred to above.