

An Air Management Plan for Hong Kong

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PREFACE

This report is in effect a 'shadow' air management plan. We felt compelled to do this because we believe Hong Kong's air quality problems can be improved dramatically within the foreseeable future. This report is written as if the Chief Executive of the Hong Kong Special Administrative Region is delivering it. We hope the government will consider taking a comprehensive approach to cleaning the air that links energy consumption with air pollution. This will necessarily require the government to deal with not only emissions from power plants but also from transportation, marine activities, port operation, manufacturing and buildings. Beyond collaboration with Guangdong, we hope the government will also link-up with cities in other parts of the world working on innovative energy-emissions reduction solutions.

Civic Exchange has worked continuously on air quality issues that also led us to focus on energy and climate change. We have not only done research relating to Hong Kong but also in regards to the Mainland, especially South China. After all, Hong Kong and Guangdong share the same air-shed. Most of our air quality and energy work has been done in collaboration with others. Our aim is to approach these complex problems in a multi-disciplinary manner. Thus, we work with scientists, economists, financiers, technologists, public healthcare professionals and policy experts.

Although I wrote this report, its contents were derived from the totality of much of the work that Civic Exchange has done to date with our collaborators. In particular, I am grateful to the scientists at the Hong Kong Environmental Protection Department, Institute for the Environment, Hong Kong University of Science and Technology, and the Polytechnic University of Hong Kong; the public health experts at the Department of Community Medicine, University of Hong Kong, and Department of Community Medicine and Family Medicine, Chinese University of Hong Kong; as well as environmental economist, Bill Barron; transport researcher, Simon Ka-wing Ng, whose knowledge, careful reading and translation skills are much appreciated; Marcos van Rafleghem who looked at what ports could do; Christopher Tung for advice on legal and international matters; Kylie Uebergang for managing our air quality projects; Ed Stokes, HKCPF for the photo on the front cover; and Mirror Productions for laying out this report and designing the accompanying document Air Quality in Hong Kong. I also wish to thank CLSA Asia-Pacific Markets for having commissioned Civic Exchange in 2005 and 2006 to do special reports for the investment funds community relating to air quality, and ADM Foundation for supporting current work. There are of course many more individuals and organisations who have helped and encouraged us over the years and we are grateful to them all. In 2006 and 2007, Civic Exchange has a busy research agenda relating to air quality, energy and climate change which will result in what we hope to be groundbreaking publications.

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Executive Summary

The government has an opportunity to end decades of pollution, dangerous air and filthy skies, leaving a legacy of healthier, cleaner air. Reducing pollution must become a central part of the government's policies that are within an overall sustainable development context.

Air Pollution at the Top of the Policy Agenda

Air pollution is the primary environmental challenge for Hong Kong and it is a critical economic as well as public health priority. The deterioration of outdoor air quality over the years has been severe and must be reversed. The government has a duty to make Hong Kong a healthy place for people to live and work.

Clear Goals to Protect Public Health

The government's goal should be to improve outdoor air quality to the point where air pollution no longer poses a significant risk to human health as it does at present. Implementation tools need to include regulation, encouragement, persuasion, collaboration, and incentivisation.

Action and Pledge

Where Hong Kong can act on its own, the government must do so expeditiously; where it cannot act alone, it must work with Guangdong, and where necessary the Central People's Government. Where Hong Kong can learn from other jurisdictions, it should.

Improvements in 24 Months

The Comprehensive Outdoor Air Management Plan is designed for Hong Kong to make real progress within 24 months and the programme fully implemented in just over five years. Hong Kong could see fresher air by 2009, and even greater improvement from 2010 to 2012.

Executive Summary (continued)

Concurrent Efforts on 4 Fronts

1. Sharpen Policy Tools:

A: Set a new Energy Policy (2007-2008) to focus on public health, worker productivity, economic growth, energy efficiency and conservation, climate change, as well as electricity reliability, safety, and at reasonable prices.

- Use public procurement to promote energy efficiency (2007 onwards) in government purchasing, including everything from goods and materials to services.
- Revise Schemes of Control (2007-2008) to reward the electric utilities to help cut customers' bills through energy efficiency and demand-side management.
- Create a new ministerial post for Energy (2007) whose job is to make Hong Kong more energy efficient and for other bureaux, departments and advisory committees to support and coordinate the city's efforts.
- Involve District Councils (2007 onwards) to find ways to reduce energy consumption and increase energy efficiency on a district basis.

B: Tighten Air Quality Objectives (2007) so that they protect public health.

- Re-calibrate the Air Pollution Index accordingly (2007).
- Put in place Air Pollution Alerts (2007) for poor quality days to help residents take appropriate action.

2. Take a Comprehensive Approach:

A: Reduce Local Air Pollution

Power Generation

- Extend emissions caps to Lamma Power Station (2006).
- Articulate long-term fuel mix policy (2006-2007).
- Secure LNG supply for Hong Kong in the foreseeable future (2007).
- Explore emissions trading further before implementation. (2006-2007)

Vehicular Transportation – General Measures

- Devise an overarching strategy for cleaner vehicles and fuels (2007).
- Improve planning and urban design (2007-2008) to reduce 'street canyon effect'.
- Legislate to stop idling engines (2007-2008).
- Set licence renewal charges based on the amount of emissions from types of vehicles (2007 Budget).
- Exempt first registration charge on basis of level of emissions (2007 Budget).
- Devise an electronic road-pricing scheme (2008-2009).
- Declare Hong Kong a Low Emissions Zone (2010) to get pre-Euro and Euro I vehicles off the road and to have Euro III or better vehicles on the road by 2012.

Executive Summary (continued)

Vehicular Transportation - Specific Measures

Franchise Buses

- Impose emission caps on bus companies (2008-2009).
- Encourage replacement of pre-Euro and Euro I buses (by 2010) with Low Emissions Zone.

Vehicular Fuels

- Facilitate adoption and use of biodiesel and ethanol (2007).
- Offer discounts to cross-border vehicles that refuel at border (2008).

Railway-Subway Expansion

- Expedite construction of new rail-lines such as South Island Line, North Island Line, Shatin-Central Line and the Northern Link (from 2007).

Shipping and Port Operations

- Reduce vessel speed within harbour (2006).
- Promote the use of lower sulphur fuels on vessels' propulsion and auxiliary engines within harbour (2007).
- Promote the use of latest technology in emission abatement (2007 onwards).
- Provide shore-side power for ships dock at terminal (start preparation in 2007).
- Promote the use of emissions control technology on port equipment (start preparation in 2007).
- Consider discounts in port fees and tariffs, berthing priority, awards as well as retrofit financial grants to drive change (2007-2008).
- Ratify Annex VI of MARPOL Convention to set-up possibility for Hong Kong to apply for its port to be a Sulphur Emissions Control Area (2006-2007).

Airport Operations

- Ask the Airport Authority to explore how airport operations can reduce emissions and be more energy efficient. (2006-2007)

B: Reduce Regional Air Pollution

Focus on manufacturing

- Facilitate the supply of cleaner fuels for use by plants' generators by working with Shenzhen and Dongguan authorities as a start (2007).
- Extend clean fuel effort to other parts of the PRD (2008 onwards).

Focus on Shenzhen ports, shipping and logistics

- Collaborate with PRD authorities to develop a Regional Green Port Policy (start preparation in 2008-2009).
- Collaborate with Guangdong to request the Central People's Government to ratify Annex VI of MARPOL Convention to set-up possibility for the entire waters of the PRD to be declared a Sulphur Emissions Control Area (start preparation by 2009-2010).

Executive Summary (continued)

Improve regional air quality management

- Allow access to real-time air quality data of each pollutant from each of the local/regional air monitoring stations (2007).
- Fund joint HK-Macau-PRD air quality research and collaboration to increase air quality management capacities with a view of setting-up a Regional Air Resources Board (by 2012).

3. Play a Pro-active Role to Facilitate Industries to Reduce Emissions (2007-2008):

- Invite and facilitate various sectors (power generation, transport, manufacturing, port and airport operations and logistics, design and construction etc) to explore how they can become more energy efficient and reduce emissions.

4. Join National and International Efforts (2006 onwards):

- Join the Chinese national team in attend international Climate Change meetings and explore how Hong Kong as a financial centre can play a role in developing and financing renewable energy, clean coal technology, carbon capture technology and Clean Development Mechanism projects with a special focus in South China.
- Help safeguard national treasures threatened by air pollution, e.g. Mogao Grottoes at Dunhuang.
- Join the International Council for Local Environmental Initiatives (ICLEI) to help reduce air emissions, including carbon dioxide.
- Join the Large Cities Climate Leadership Group and become a part of their collective influence in reducing carbon emissions.

A. Introduction

1. Air pollution is the primary environmental challenge for Hong Kong. The deterioration of our outdoor air quality over the years has been severe and must be reversed.¹ I am therefore putting improving air quality at the top of my policy agenda. We have a duty to make Hong Kong a healthy place for people to live and work in and improving air quality is therefore a critical economic as well as public health priority.

2. My goal is to improve Hong Kong's outdoor air quality to the point where pollution no longer poses a significant risk to human health as it does at present.² Reducing pollution must become a central part of our policies.³

3. There is no single approach, or silver bullet, to dealing with improving air quality. There must be a programme of solutions that falls within a broader sustainable development strategy.

4. My implementation tools will include regulation, encouragement, persuasion, collaboration, and incentivisation with the right price signals. Where Hong Kong can act on its own, we will do so expeditiously. Where we cannot act alone, I will work with our neighbours in Guangdong, as well as the Central People's Government and the appropriate national agencies, where necessary. Where we can learn from other jurisdictions, we will.

5. The primary benefit of this Air Quality Plan is that real progress will be made in just 24 months and the programme fully implemented in just over five years. As other cities and jurisdictions have successfully demonstrated, pollution does not have to be a problem that is 'too difficult' to address. I am confident that by implementing the ideas within this Plan, Hong Kong should see fresher air starting as early as 2009, with even greater, sustainable improvement from 2010 to 2012 (Appendix 1 – Air Management Plan Timeline). I promise you I will both drive change and make change to our environment in Hong Kong

Basic Principles

6. To improve air quality, the key principles to bear in mind are:

The less fossil fuels we burn, the less we pollute;

The more efficiently we produce energy, the less pollution we emit;

The more efficient we are in delivering energy down the supply chain and in its end use; the less pollution we produce; and

The cleaner the fuels we use, the better for air quality.

My proposed Air Management Plan reflects these principles.

¹ For a summary of Hong Kong's air pollution problems and statistics, see Civic Exchange's Hong Kong's Air Quality, August 2006, accompanying this document. Despite improvements in certain specific pollutants, the overall air quality has gotten worse and trends remain worrying.

² This is London's policy goal, Cleaning London's Air: The Mayor's Air Quality Strategy – Executive Summary, September 2002, p.1.

³ For a summary of Hong Kong's air pollution problems and statistics, see Civic Exchange's Hong Kong's Air Quality, August 2006, accompanying this document. Despite improvements in certain specific pollutants, the overall air quality has gotten worse and trends remain worrying.

B. Develop a Comprehensive Strategy

7. Having reviewed the current situation, I have concluded that the Hong Kong Special Administrative Region Government (HK-SARG) must work concurrently on FOUR fronts:

8. First, we will articulate an overall Sustainable Development Strategy, which will become Hong Kong's operational framework for all our policies, within which we will need to address climate change, as well as deal with air pollution by sharpening two policy tools, namely:

- We must update our Energy Policy; and
- We must tighten our Air Quality Objectives (AQOs) to make sure they are calibrated appropriately to drive change expeditiously.

9. Second, with what I just said in mind, we need to take a comprehensive, evidence-based approach, including multi-emission sources, to significantly improve our air quality. This approach requires us to:

- Reduce air pollution emitted locally; and
- Collaborate with the neighbouring authorities in Guangdong to reduce regional air pollution.

10. Third, we must play a pro-active role to bring together and facilitate multiple discussions among various industry sectors operating locally and regionally in order to help them find ways to lower emissions both in the short-term and long-term. We must also carry the public at large with our new policies, some of which will no doubt be regarded as controversial but ordinary citizens already know they are paying a high price in terms of their health.

11. Fourth, Hong Kong must reach out and join hands with others both nationally and internationally to better protect the environment. As air pollution arises mainly from the combustion of fossil fuel, by becoming more energy efficient, it will also help us to reduce our collective impact on climate change.

C. New Air Management Plan

12. I will now provide details on each of the four aspects of our new Air Management Plan.

Sharpen Policy Tools

13. Set a Modern Energy Policy [Implement 2007-2008]: First, we must start by articulating a new Energy Policy for Hong Kong that is right for the 21st Century with sustainability principles in mind. I propose the following:

The objective of Hong Kong's Energy Policy is to ensure the public can enjoy reliable and safe energy supplies at reasonable prices within an energy system that provides energy services at least cost to society; does not waste scarce energy resources; generates and uses energy highly efficiently; seeks to spur economic growth; protects the local environment; reduces Hong Kong's contribution to climate change; increases human resource productivity; and promotes public health.⁴

14. I propose this restatement of policy because it:

- (a) Puts safety and reliability first, which is what the public expects and deserves;
- (b) Takes price considerations into account;⁵
- (c) Refers to an energy system and not just an electricity market;
- (d) Refers to energy services at least cost to society;
- (e) Emphasises energy resources are scarce and policy will seek to minimise wastage;
- (f) Focuses attention on using policy to help drive energy efficiency in both electricity generation and usage; and
- (g) Recognises that energy needs to be seen in context of driving economic development (through conservation and efficiency measures), protecting the environment (through reducing emissions in electricity generation and consumption, which will also reduce climate impact), increasing worker productivity (through improving indoor working environments on air quality, temperature control, lighting etc), and protecting public health (through improving occupational and environmental health).⁶

4 This statement was first proposed by Civic Exchange, Rocky Mountain Institute and WWF in *Response: Consultation Paper on Future Development of the Electricity Market in Hong Kong – Stage II Consultation*, March 2006. For the full discussion on a new integrated energy policy, see the paper at www.civic-exchange.org/publications/2006/electricitysub.pdf

5 Ibid, the government policy objectives are: the public can enjoy reliable, safe and efficient energy supplies and reasonable prices, and to minimise the environmental impact caused by the production and use of energy.

6 Ibid.

C. New Air Management Plan (continued)

15. Revise Basis of the SOCs [Implement 2007-2008]: In terms of the HKSARG's review of the Schemes of Control for the two electricity utilities, our new approach will be reflected in the Economic Development and Labour Bureau's response to two rounds of public consultations. The revised Schemes of Control from 2008 will reward the utilities for cutting customers' bills rather than for selling more electricity. In this way, the regulatory system will better align the interests of all parties – the utilities (to earn profits), customers (to benefit from energy efficiency and lower bills), and the HKSARG (to achieve our new energy policy).⁷ When interests are properly aligned, I believe we can make significant advancement.

16. Save Energy – short-term measures: Air-conditioning accounts for one-third of Hong Kong's yearly electricity consumption. By raising the air-conditioned room temperature from 22.5 C to 25.5 C, the electricity consumed can be reduced by 10%. By using appliances with Energy Efficiency Labels⁸ (Grade 1 or 2) electricity consumption can be reduced by 20% to 30%. If all homes and offices adopt these simple energy conservation measures, we can save 400 million units of electricity each year. These measures will reduce the amount of electricity required to be generated and, in turn, our power plants' emissions.⁹ I have already required all government offices and publicly-managed buildings to save energy and have also called on the private sector to follow.¹⁰

17. Use public procurement to promote energy efficiency [Implement 2007]: I have asked the Treasury to look at how we can use the HKSARG's procurement to promote energy efficiency. Officials will look at the HKSARG's shopping power of everything from consulting and professional services to construction and to purchases of goods, including building materials, computers, office equipment, electrical appliances, lighting, vehicles, batteries and so on to see what we can do from 2007. We will ensure we spend our money wisely to get maximum efficiency during the full life of the products. It may well be worth paying more upfront for better products.¹¹

7 For a full discussion, see Civic Exchange and Rocky Mountain Institute, *Response: Consultation Paper on Future Development of the Electricity Market in Hong Kong – Stage I*, 30 April 2005, www.civic-exchange.org/publications/2005/EDLB%20Consultation.pdf

8 The Electrical and Mechanical Services Department operates a voluntary Energy Efficiency Labelling Scheme for appliances and equipment used both at home and office as well as for vehicles, and the HKSARG is in the process of turning the scheme into a mandatory one.

9 These are existing government measures, see *Press Release, Campaign to Bring Blue Skies back to Hong Kong*, 25 July 2006, www.epd.gov.hk/epd/english/news_events/press/press_060725a.html

10 The Chief Executive's *Action Blue Skies* campaign called for “dress down in summer” to accompany the promoting of turning up air-conditioning. By adjusting government offices' temperature to 25.5C, the government reckons it can save HK\$70 million in electricity bills each year, Staff reporters, “Liao admits pollution problem is complicated”, *The Standard*, 28 July 2006, p.M1. On a territory-wide basis, air conditioning accounts for 1/3 of Hong Kong's electricity consumption. By raising temperature of all air-conditioned premises by 3 degrees C, the government believes it will save the public HK\$900 million in electricity tariffs per year, Donald Tsang, “Working together for blue skies”, *South China Morning Post*, 11 July 2007, p.A7.

11 In the UK Government asked Sir Neville Simms to study how the government could use its procurement power to promote sustainable development. Simms submitted his report *The National Action Plan: Procuring the Future*, on 12 June 2006, see www.sustainable-development.gov.uk/publications/procurement-action-plan/index.htm

C. New Air Management Plan (continued)

18. Save Energy – longer-term measures [Implement 2007]: I propose the HKSARG create a new ministerial post to focus on energy.¹² We will also setup an Energy Authority to perform regulatory functions¹³ and be a platform to engage the public, as well as others internationally (Section F). The minister's job will be to identify how Hong Kong can become much more energy efficient because this is the most cost-effective way to meet our needs. By using less energy we can reduce air pollution, including carbon emissions that impact climate, improve public health, enhance the security of our energy supplies, and improve the competitiveness of our businesses. The new minister will investigate what Hong Kong can do and issue a broad plan of action.¹⁴ In addition, I will also align the duties of the minister for energy and the minister for the environment so that they work closely and collaboratively together.¹⁵

19. Involve District Councils [Immediate implementation]: I propose that we also look at how to reduce energy consumption and increase efficiency on a district basis. This will require the active involvement of all the District Councils.¹⁶ The District Councils can play an important role in smoothing out transport interchanges, monitoring planning tools to reduce 'street canyon effect' and promoting pedestrian schemes (paragraph 48).¹⁷

Tighten Air Quality Objectives and Recalibrate Air Pollution Index

20. Second, we must tighten Hong Kong's AQOs. The HKSARG will then set targets to achieve them. Currently, our AQOs are comparatively lax. A tighter set of AQOs will push all relevant government departments to act quickly, as well as focus the attention of the private sector to take appropriate emission reduction actions.

12 This means the Economic Development and Labour Bureau will no longer have the energy portfolio.

13 In the Economic Development and Labour Bureau's consultation document on reforming the electricity market, it proposed the setting-up of an Energy Authority

14 An example of an energy plan is the UK's *Energy Efficiency: The Government's Plan for Action*, April 2004, and the subsequent *The Energy Challenge: Energy Review Report 2006*, July 2006.

15 The portfolio of the Secretary for Environment, Transport and Works may be revamped in 2007 when the next Chief Executive term begins, offering a chance for realigning responsibilities with the aim of achieving sustainable development in mind.

16 The example of Woking, a city of 100,000 people, in the UK is inspiring. With combined heat and power cogeneration systems and solar energy (10% of Britain's installed capacity), Woking has reduced its energy use by 48% since 1990. The city is also 90% independent from the grid, with its own energy services company, www.woking.gov.uk (search 'energy'). Every one of the districts in Hong Kong is substantially larger than Woking in terms of population. Woking's successes are now being scaled-up for London.

17 The HKSARG has published a consultation document on reforming the District Councils. The public can submit views on how the councils can be used much more effectively to improve urban planning in the districts, as well as to help implement the rail-led transport policy rather than to fight for more bus stops and routes without reference to wider impacts on congestion, energy consumption and air quality. See *Review of the Role, Functions and Composition of the District Councils*, 2006, Home Affairs Bureau, www.dc-review.gov.hk/welcome/index.htm

C. New Air Management Plan (continued)

21. This new step will put tremendous pressure on the HKSARG. We cannot fully meet the current AQOs right now, so by tightening them, we will initially fail by an even larger margin. We may possibly even open ourselves to court challenges by concerned citizens for not meeting them. But, this is not a sufficient reason to avoid revising the AQOs. Moreover, the World Health Organisation (WHO) is about to further tighten its recommended global Air Quality Guidelines based on expert evaluation of current scientific evidence. These new guidelines will show a large gulf between our current Hong Kong AQOs and what will be recommended by the WHO (Appendix II – Comparisons of International Air Quality Standards).¹⁸

Pollutant	Time	Target (micrograms/cubic metre, 2004)	Evaluation	New WHO Guidelines
Sulphur dioxide	24 hours	350	Well achieved	20
Nitrogen dioxide	1 hour	300	Not achieved	200
	1 year	80	Achieved at general but not roadside stations	40
RSP (PM10)	24 hours	180	Not achieved	50
	1 year	55	Not achieved	20
Ozone	1 hour	240	Not achieved	100 (8 hours)

Table 1: Hong Kong's targets for the average pollution concentration

22. It is right to tighten the AQOs otherwise they continue to be a licence to pollute. To allow that would be irresponsible. We can no longer pretend our AQOs are sufficient to protect public health. I will shortly propose a set of intermediate AQOs targets in terms of pollutant concentrations mapped out on a timeline, with a mandatory approach to adhere to, aimed at improving both general and roadside air quality. They will be implemented in January 2007, since that is within Hong Kong's own control. We will continue to consider how to revise the overall ambient AQOs and make further proposals for public consultation in January 2007.¹⁹ We will need to recalibrate our Air Pollution Index (API) to reflect the revisions and my intention is to make it more meaningful to people by showing absolute concentrations rather than the arbitrary "low", "medium" and "high" bands because they are not useful in terms of health protection [Implement 2007-2008].

18 WHO, *WHO air quality guidelines – global update 2005: Report on a Working Group meeting, Bonn, Germany, 18-20 October 2005*.

19 HKEPD have already put a discussion paper to the Advisory Council for the Environment (ACE) on its 17 July 2006 meeting, see www.epd.gov.hk/epd/english/boards/advisory_council/files/ACE_Paper_14-2006.pdf. Members of ACE asked for a more ambitious and expeditious programme and the matter will be discussed again in a future meeting. ACE will hold a workshop on 18 September 2006 to review of AQOs.

C. New Air Management Plan (continued)

23. At the same time, the HKSARG will work on a system of Air Pollution Alerts for poor air quality days so that we can give the appropriate advice to our citizens to take action [Implement 2007-2008].²⁰ With 43 per cent of the days in a year being badly polluted and knowing that by improving air quality we can avoid 1,600 deaths and 64,000 hospital days a year, as well as avoiding HK\$21 billion in health and productivity losses annually,²¹ I am confident the public will support strong action to bring about substantial improvements in the next few years.

D. Reducing Local and Regional Air Pollution

24. There are two distinct aspects to Hong Kong's air quality.

25. First, there is local pollution arising from Hong Kong's power plants, vehicles, ships, aeroplanes, buildings etc.

26. Second, there is regional air pollution – a well-mixed combination of emissions that contribute most to the haze problem that envelops much of the entire Pearl River Delta region, including Hong Kong and Macau.

27. Since reaching a consensus with the Guangdong Provincial Government in April 2002 to improve regional air quality by reducing the emissions of 4 major air pollutants in the region by 2010, using 1997 as the base year, the HKSARG has aimed its policies to meet these targets. You can see from the many measures we have initiated that we have not been idle (see Appendices III and IV).²²

28. The fact is that air pollution has become far more severe. Locally, our power plants have emitted a greater quantity of emissions as electricity demand increased; our vehicular fleet pollutes heavily and our roadside air quality is extremely poor; and emissions contributions from marine sources have also gone up. Regionally, with Guangdong's rapid development on all fronts, the demand for energy is growing so fast that emissions have correspondingly increased.

Fighting Local Air Pollution

29. Let me start by summarising the action Hong Kong is taking and then explain what further action the HKSARG will take to fight local air pollution.

30. The measures that we have taken so far were effective but not aggressive or comprehensive enough. I propose a set of further actions to fight air pollution.

20 Action on alert days may include such measures as staying indoor, not to use private cars and restrict traffic going into dense urban areas.

21 Anthony J Hedley, Sarah M McGhee, Chit Ming Wong, Bill Barron, Patsy Chau, June Chau, Thuan Q Thach, Tse Wai Wong and Christine Loh, *Air Pollution: Costs and Paths to a Solution*, The Department of Community Medicine, University of Hong Kong; Institute for the Environment, Hong Kong University of Science and Technology; Department of Community and Family Medicine, Chinese University of Hong Kong; and Civic Exchange, June 2006, www.civic-exchange.org/publications/2006/VisibilityandHealthE.pdf

22 To improve regional air quality, the agreement provides the emissions of SO₂, NO_x, RSP and VOC to be reduced by 40%, 20%, 55% and 55% respectively on a best effort basis by 2010 using 1997 as the base year. For a critique of the Regional Emissions Reduction Targets, see Civic Exchange's *White Paper on Air Quality Management Issues in the Pearl River Delta Region*, November 2004, www.civic-exchange.org/publications/2004/airpollutionwhitepaper.prd. Appendices II and III of this report are summary charts based on the various control measures Hong Kong and Guangdong agreed to implement that the HKEPD provided to LegCo's Panel on Environmental Affairs, *Progress of Measures to Improve Air Quality, Including Those Taken By The Two Power Companies to Meet The Government's Emission Reduction Targets by 2010*, 23 January 2006.

D. Reducing Local and Regional Air Pollution (continued)

I: Power Generation

31. Our current plans require the two electric utilities²³ to accelerate the timing of various emissions reduction projects,²⁴ require the use of low sulphur coal,²⁵ and encourage the use of natural gas.²⁶ We have also imposed total emission caps on the Castle Peak Power Station and Black Point Power Station.²⁷

32. Our new approach will seek to:

- Articulate a clear and longer-term fuel mix policy to achieve energy security and the other stated goals in our new energy policy (paragraphs 12-13) [Implement 2007];²⁸
- Ensure the security of supply of Liquefied Natural Gas (LNG) for Hong Kong in the foreseeable future by approving the building of an LNG receiving terminal as quickly as practicable [Take decision 2007];²⁹ and
- Extend emissions caps to the Lamma Power Station in Hong Kong in 2006,³⁰ tighten emissions caps further in the foreseeable future,³¹ and increase penalties for any power station not meeting the caps under the Air Pollution Control Ordinance.³²

23 CLP Power operates the coal-fired Castle Peak Power Station, the gas-fired Black Point Power Station, and the back-up, diesel oil-fired Penny's Bay Power Station. HEC operates the Lamma Power Station using coal for generation. Extension plans at Lamma will provide new gas units with the first one coming on stream in 2006. These new units will be powered by LNG.

24 CLP Power is retrofitting the coal-fired Castle Peak Power Station with flue gas desulphurization (FGD) and catalytic reduction equipment with phased completion dates from 2009 to 2010. HEC is installing FGD with phased completion date in April 2010.

25 Since the sulphur content of coal varies according to sources and batches, the annual average sulphur content of coal used for power generation in Hong Kong would also vary, normally within the range of 0.4% to 0.7%. The HKEPD-issued Specified Process Licences issued to each power plant under the Air Pollution Control Ordinance specify the coal used for power generation must not exceed 1% sulphur content. In 2005, the percentage of electricity generated by local power plants using low sulphur coal was 69% according to official information.

26 Since 1997, the HKSAR Government will not approve new generating capacity using coal. New generating capacities will have to use natural gas, which is the cleanest fossil fuel.

27 Prior to the imposition of emission caps, power plants were only required to meet certain pollution concentration limits in emissions. From August 2005, the HKEPD aims to progressively tighten the emissions caps upon the renewal of the plants' Specified Process Licences issued under the Air Pollution Control Ordinance. Caps were imposed on CLP Power's Castle Peak Power Station from 1 August 2005 and the Black Point Power Station from 1 January 2006. According to the HKSARG, in the past 12 months, CLP Power's SO₂ and particulate emissions have come down by 12% and 18% respectively, Sarah Liao, "Together, we can improve air quality", *South China Morning Post*, 9 August 2006, p. A13.

28 The HKSARG should put forward its view of what may be the optimal fuel mix for Hong Kong (since Hong Kong imports all its energy resources) rather than just to stop approving new coal-fired generating capacity.

29 CLP Power's Black Point Power Station is currently taking natural gas by pipeline from the Yacheng field in the South China Sea but this field is expected to be depleted around the turn of the decade and CLP Power will need to secure a new source of gas. It has completed an Environmental Impact Assessment for the construction and operation of an LNG receiving terminal at either South Soko Island or Black Point so that LNG can be imported.

30 HEC is twice as polluting as CLP per kilowatt of electricity sold. When its Specified Process Licence is renewed in September 2006, an emissions cap will also be imposed.

31 Emission caps should be set lower than historical emissions. A Specified Process Licence is usually issued under the Air Pollution Control Ordinance for 2 years. Thus, emission caps can be reviewed every 2 years and considerations can be given to whether caps should be further tightened. Green groups complained the caps were set too high, making it easy for the power plant to meet them. CLP Power argued that the Ordinance requires when HKEPD is deciding whether to grant or refuse a licence, it shall have regard to the capability of the plant to provide and maintain the 'best practicable means' for the prevention of emission.

32 The Air Pollution Control Ordinance provides for a fine of HK\$100,000 for the first offence and HK\$200,000 for a second/subsequent offence. Green groups believe these financial penalties are set too low. However, the power companies point out the penalties are in fact tough when taking into account s47(A) of the Ordinance which provides the power company's director, manager and secretary or other person concerned with management are also personally liable – a successful prosecution could result in a fine of between HK\$100,000-\$500,000 and 6-12 months imprisonment.

D. Reducing Local and Regional Air Pollution (continued)

33. Having brandished a bigger 'stick', we are now proposing to offer a larger and sweeter 'carrot' under the new Schemes of Control by allowing the utilities to reap attractive profits from helping users to reduce energy consumption by being more efficient in using energy (paragraphs 13-15),³³ as well as in generating power from renewable sources.³⁴

II: Emissions Trading

34. As has already been announced that together with the Guangdong Provincial Government, we have agreed on an implementation framework for an Emissions Trading Pilot Scheme for Thermal Power Plants in the Pearl River Delta Region.³⁵

35. Before I go into details, let me make a few points about emissions trading. Emissions trading is often described as a market-based scheme to achieve environmental improvement but its political and administrative dimensions are frequently overlooked. Emissions trading schemes should be seen for what they are. They are environmental policy instruments. Setting pollution reduction targets, like those that Hong Kong and Guangdong set in 2002, and setting emissions caps for power plants as we started to do here in 2005, are a part of environmental regulation, as is emissions trading.

36. Therefore, to be successful, the design of an emissions trading scheme must achieve stated environmental goals. We must never forget the primary goal must be to have every power plant in the Hong Kong-Guangdong region supply power reliably and meet emissions caps at the same time. When that is achieved, then it will be time to implement emissions trading to further squeeze emissions reduction.

37. Moreover, we should not expect emissions trading to work miracles. Indeed, the idea works best within an environmental regulatory system that is already reasonably mature, where trading emissions can squeeze more reductions at the margin. Even then, there can be hiccups, as is the case with the European Union's emissions trading scheme.³⁶ Substantial emissions reduction for us will still come from other regulatory methods to reduce emissions from source.

33 In the *Stage II Consultation Paper on Future Development of the Electricity Market in Hong Kong* (30/12/05), the Economic Development and Labour Bureau proposed the utilities' permitted rate of return on all fixed assets be linked to their achievement of the emission caps with penalties and bonus. Civic Exchange's proposal is fundamentally different as it proposes to enable the utilities to make money based on not just how much electricity they sell but how much they help to reduce consumption through demand side management and energy efficiency. See footnotes 4 and 7 for full references.

34 Currently, both HEC and CLP have targets of generating 1%-2% from wind power.

35 HKSAR Government press release, *Ninth Plenary of HK/Guangdong Co-operation Joint Conference*, 2 August 2006, www.info.gov.hk/gia/general/200608/02/P200608020264.htm although few details about the scheme have been released to date except that the extent of trading will be determined by emissions caps, trading will be reached privately between the participating power plants and monitored by regulatory bodies. Thus, there seems to be no public transparency to the arrangements, Cheung Chi-fai, "Emissions pilot scheme set to start", *South China Morning Post*, 3 August 2006, p. A3.

36 Bloomberg News, "EU trading of pollution credits fails on goals", *International Herald Tribune*, 25 July 2006, p.11.

D. Reducing Local and Regional Air Pollution (continued)

38. As such, at this stage, the Hong Kong-Guangdong scheme is exploratory, limited to power plants and voluntary in nature. This will enable it to be properly designed because emissions trading takes place within a complex political-legal-technical infrastructure and we need to get it right. The experimental stage is expected to last at least two years. As such, it makes sense for our pilot scheme to be exploratory in nature so that problems can be ironed out before we consider implementing the developed scheme in full and extending it eventually beyond power plants.

39. A voluntary, exploratory scheme at this time will more likely entice all the power plants in the region to participate. We need the opportunity to work with them to finalise the design of an effective system that meets our stated environmental goals. In other words, we will invite the power plants to provide input into the operation of the scheme at the exploratory stage. It is in the interest of every power plant to participate during the exploratory stage because the national long-term goal is to create compulsory emissions trading schemes in various regions.³⁷

40. In designing the exploratory scheme, we will bear in mind that emissions trading schemes only truly work to reduce pollution if:

- Emissions are properly policed against quotas (also referred to as permits or allowances);
- The quotas granted at the outset are substantially less than the current aggregate emissions levels of all participants; and
- The penalties for breach of quota limits are more than the cost of reduction.

41. Thus, we will need to develop:

- A common approach to measuring emissions and develop an emissions inventory that can reflect changes in emissions as a result of fast-paced economic changes,³⁸ as well as an accurate method to track all emissions and reductions by each participant;
- A method to identify emission sources covered by the scheme;
- A clear group of participants;
- A transparent market in trading quotas to ensure fairness and public oversight;
- An administrative agency to monitor, regulate and enforce the system; and
- A method for how to set emissions quotas, how to price them, what levels of fines may be imposed for those who exceed their quotas, and whether income from the quotas can be used to fund the regulatory agency.

42. Each one of these components represents a major challenge. Currently, we do not yet have a unified set of emissions standards and a common method for estimating emissions between Hong Kong and Guangdong and this must also be factored in. Nevertheless, despite the difficulties, our exploration is an ambitious one and important for the long-term environmental regulation of our region.

³⁷ Sarah Liao said State Environmental Protection Agency approved 7 points within Mainland China to allow emissions trading as pilot cases, on top of allowing two more points – Hong Kong and Macau – to carry out pilot schemes, see Wendy Lim and Emma Graham-Harrison, “Guangdong, Hong Kong Mull Emissions Trading Scheme”, *Reuters*, 3 August 2006.

³⁸ The HKSAR Government is expected to release a regional emissions inventory based on 2003 data.

D. Reducing Local and Regional Air Pollution (continued)

III: Vehicular Transportation

Overall Issues

43. Our other major air pollution problem is transport-generated emissions. Hong Kong has 1,955 km of roads and over 540,000 licensed vehicles, which represents very high road traffic density – indeed, probably the highest in the world.³⁹ Moreover, our densely built-up areas and high reliance on diesel vehicles in Hong Kong are unique. Some 25% of our vehicles have diesel engines and they account for 50% of all vehicle kilometres travelled each year.⁴⁰ The hilly topography adds to the effect of the many high-rise buildings in the urban centres, restricting the flow of air and inhibiting dispersion of air pollution – what is known as the ‘street canyon effect’. This leads to a build-up of pollutant concentrations in the urban area at street level that degrades the quality of life of many and also presents a grave threat to public health.⁴¹

44. Weather conditions also have very significant effects on the concentration of air pollution, much more so than can be explained by the day-to-day changes in emissions. Hong Kong’s position on the coast of the large Asian landmass, its rugged terrain and uneven coastlines mean that we are subject to prevailing summer and winter monsoons with strong land-sea breezes that can cause the local wind to deviate significantly from the prevailing situation. Pollution can be trapped locally. Usually the worst air pollution situation in Hong Kong occurs when it is on the edge of a typhoon, where humidity is low, wind is light and dispersion is weak. Similar situations also occur during the transition between the two monsoons in March–April or August–September.

45. Our new policy builds on what the HKSARG is already doing but we need to be much more aggressive. Even though Hong Kong had a vehicular emissions reduction programme since 1999, which has reduced about 80% of the particulates and 40% of the NO_x emitted by motor vehicles in the urban area, and reduced particulates and NO_x levels by 14% and 17% respectively in 2005 as compared with the 1999 levels at roadside, this is simply still not yet good enough because gains have been eroded over time through growth in road traffic, and our roadside pollution remains extremely poor by world standards.⁴²

46. To help achieve continuing emissions reduction from transport sources, we need to design an effective and overarching strategy for introducing cleaner fuels and vehicles. My proposals in this Air Management Plan (main text below) should be considered in conjunction with a set of Cleaner Vehicles and Fuels Action Plans. As there are many issues involved, the subject is complicated and complex but as I said there is no one solution. We need a programme of solutions that is continuously adjusted to keep pace with technological changes. There are five Action Plans [Prepare 2007]:

- The Action Plan for Introducing New Technologies (Appendix V);
- The Action Plan for Reforming Regulation and Planning (Appendix VI);
- The Action Plan for New Incentives (Appendix VII);
- The Action Plan for Infrastructure and Research and Development (Appendix VIII); and
- The Action Plan for Education and Training (Appendix IX).⁴³

39 *Highways (Hong Kong: The Facts)*, May 2006. There are roughly 276 vehicles for each kilometer of road.

40 The HKEPD website www.epd.gov/hk

41 Street level pollutants have a large and predictable damaging effect on blood vessels and lung function. Pollutant profiles show how the populations in different parts of Hong Kong suffer big impacts from short-term variations in pollutants, especially with SO₂ and particulates. These marked variations tend to go unnoticed when they are smoothed out in the average annual figures.

42 The HKEPD figures showing these improvements in fact omitted counting the Mongkok roadside station, which would have lowered the figures. Furthermore, the extrapolated slopes for NO_x and RSP (PM₁₀) are not showing a distinct downward trend.

43 These proposals are adapted from Lisa Hopkinson and Suzanne Skinner, *Cleaner Vehicles and Fuels: The Way Forward*, Civic Exchange, August 2001, www.civic-exchange.org/publications/2001/cleanervehiclesfuels.zip

D. Reducing Local and Regional Air Pollution (continued)

47. Currently, we exempt the first registration tax for electric vehicles because they are less polluting. I propose to change this by making exemptions from first registration tax on the basis of the level of emissions, including with carbon emissions. This change will indicate the HKSARG is neutral on the type of technology and focuses incentives on the actual emissions. Furthermore, we will also use the level of emissions to set the level of the annual licence fee with cleaner engines paying less [Implement 2007 Budget].⁴⁴

48. In addition, future gains in emissions reduction will also require planning-based measures, such as transport demand management and rail expansion. We need to press ahead with smart transport management policies, which are likely to be controversial but they are our best way to clean-up within a short time. I propose the following new measures:

- **Implement Road Pricing** [Implement by 2009]: We will complete the electronic road pricing study in 2007.⁴⁵ We will then consult the public on a charging scheme that can be rolled out by 2008-2009.
- **Declare Hong Kong a Low Emission Zone** [Implement 2010]: We will get pre-Euro (pre-1992) and Euro I (pre-1996) vehicles off the road as soon as we can, and when that is done, we will start to encourage the replacement of Euro II vehicles. Our idea is to explore declaring Hong Kong a Low Emission Zone, which I will speak more about in a moment (paragraphs 57-58). This plan is designed to deal with our comparatively old franchise bus fleet and diesel-powered commercial goods vehicular fleet. Together with a new electronic road pricing scheme, we will be able to track vehicle movement easily.

Engine	Particulate Matter	Carbon Monoxide	Hydro-carbons	Nitrogen oxides
Euro I	0.36	4.5	1.1	8
Euro II	0.15	4	1.1	7
Euro III	0.1	2.1	0.66	5
Euro IV	0.02	1.5	0.46	3.5

Table 2: Exhaust emissions gram per kw/h

- **Improve Planning and Urban Design** [Implement Immediately]: We also have ideas to reduce energy intensity in our city, as well as the 'street canyon effect'. For all new development and re-development areas (such as Central Reclamation, West Kowloon, Kai Tak, Kwun Tong etc), we will carry out both energy studies and air ventilation assessments to see how we can use planning and urban design tools to minimise long-term energy usage, optimise energy efficiency, as well as to ensure buildings are placed and designed to maximise air flow so pollution will not be trapped so easily. We need the help of the District Councils to help understand how these measures can improve the quality of life for them and help Hong Kong as a whole to fight air pollution.

⁴⁴ Electric vehicles will make the grade. As for hybrids, this will depend on the exact type. While hybrids are generally more efficient than petrol or diesel vehicles, a smaller Euro IV petrol car may be cleaner and more efficient than a large hybrid sports car. Germany has an Ecotest system ranking cars in terms of both polluting emissions and carbon emissions. The UK has a register of vehicle models that are exempt from road charges. These are mainly alternative fuel or small vehicles, but there is no blanket exemption for a particular technology.

⁴⁵ The HKSAR Government has been updating the transport model developed some years ago with latest data to assess the impact of different charging scenarios on relieving traffic congestion.

D. Reducing Local and Regional Air Pollution (continued)

49. Legislate to stop idling engines [Implement 2007-2008]: One issue that is less controversial is to legislate against idling engines, which has already been well-discussed publicly. As to who will police it, apart from it being a part of the normal duties of traffic police, I believe our citizens will make excellent monitors, just as they have done with the Smoky Vehicle Schemes. The Smoky Vehicle Spotters programme can be extended to include spotting idling engines, as well as further tightened the length of continuous smoke from 5 seconds to 2 seconds.⁴⁶

Specific Measures

(1) Franchise Buses

50. Our new energy and air pollution control policies will focus on working with the franchise bus companies to make our bus fleet more energy efficient and therefore less polluting.

51. There are two problems we need to deal with:

52. **An old bus fleet:** Our first problem is that Hong Kong has a relatively old diesel-powered bus fleet. As of 2005, Hong Kong has about 5,475 franchised buses, of which 785 buses are Pre-Euro and 1,338 are Euro I, which even if they use the cleanest ultra low sulphur diesel, remain highly polluting because of the old engine technology.⁴⁷

53. Our past policies included working with the bus companies to install diesel catalysts on older buses to reduce particulates.⁴⁸ The bus companies are retrofitting all Euro II and Euro III buses with continuous regeneration traps (high efficiency traps), which can improve the level of particulates.⁴⁹ We are also working with the bus companies to run Euro II or cleaner buses on busy roads.⁵⁰ While these measures are useful, our new goal is to get the Pre-Euro and Euro I buses off the road as quickly as possible in order to reduce all pollutants to the lower levels current technology provides. I will come back to how we will incentivise change in a moment.

	KMB	CityBus	New World First Bus	Total
Pre-Euro	678	54	53	785
Euro I	939	308	91	1,338
Euro II	1,488	380	479	2,347
Euro III	920	10	75	1,005
Total	4,025	752	698	5,475

Table 3: Number of franchise bus types

46 HKEPD operates the Smoky Vehicle Emission Control Programme that requires smoky vehicles spotted by accredited spotters (citizens can sign up) to undergo a smoke test. Failure to pass the test results in the licence being cancelled. The Police mount roadside smoke-testing operations. Fixed penalty tickets are issued to those who fail the test at HK\$1,000.

47 London has about 8,040 buses – approximately 60% of them meet Euro III standards, with the rest being of Euro II standards, and 39 meeting Euro IV as of end April 2006. The Euro II and III buses are all fitted with particulate filters to reduce particulates further to meet Euro IV standards for particulates.

48 Since 2001, 90% of the pre-Euro buses were retrofitted and the rest (10%) were replaced with Euro III buses by end-2002, see LegCo Paper “Background brief on Retrofitting of particulate reduction devices on pre-Euro diesel vehicles”, CB(1)769/01-02(02), on 14 January 2002. <http://www.legco.gov.hk/yr01-02/english/panels/tp/papers/eatp0115cb1-769-1e.pdf>

49 In renewing the franchise agreements for KMB and City Bus the renewals required the bus companies to fit CRTs to all their Euro II and III buses.

50 From August 2006, all buses running on Yee Wo Street and over 80% of the buses operating on Hennessy Road, Queensway and Des Voeux Road, as well as Nathan Road, are Euro II or above, see LegCo Paper CB(1)14/05-06(01) 2005-06 Policy Agenda: Transport-related Initiatives of the Environment, Transport and Works Bureau, 13 October 2005.

D. Reducing Local and Regional Air Pollution (continued)

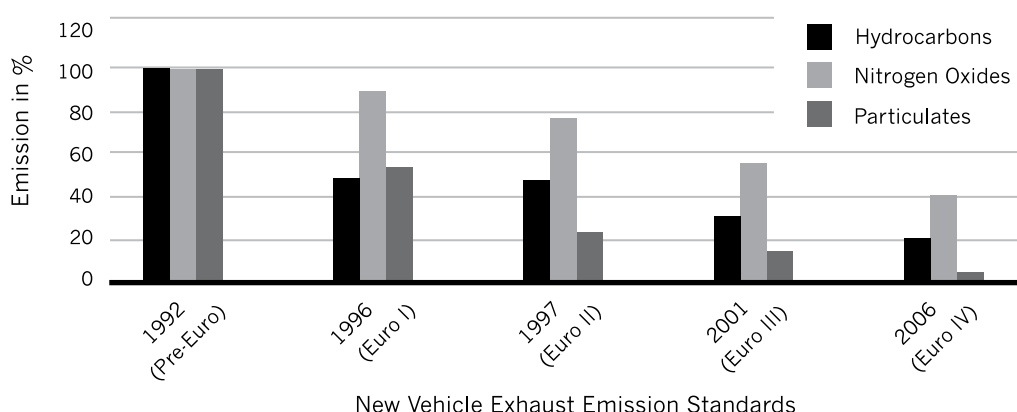
54. The ‘empty buses’ and ‘freezing bus’ phenomena: Our second problem is what the public calls the ‘empty buses’ and the ‘freezing bus’ phenomena. The public has complained for a long time that there are an inordinate number of buses carrying very few passengers in the heart of our urban centres, which are already highly congested. The ‘empty buses’ problem arises because the marginal cost for the bus operators to run additional buses on the road is very low even though there are few customers. The ‘freezing bus’ problem arises essentially for the same reason – it is cheap for the bus companies to keep temperatures low without considering public health and energy impacts.⁵¹

55. Impose emissions caps on bus companies [Implement 2008]: My proposed solution is to impose emissions caps on bus operators just like we are doing with power plants under the Air Pollution Control Ordinance. This will incentivise bus operators to remove and/or replace old buses sooner as the emission levels for each bus company will be capped and they will need to find ways to meet the caps or face large fines. This will also increase their marginal cost for running additional buses and should reduce the ‘empty buses’ problem. This measure will also force the bus companies to consider the wider consequences of running ‘freezing buses’ thus encouraging them to up the temperature.

(2) Commercial Goods Diesel Vehicles

56. Hong Kong also has an old diesel commercial goods vehicular fleet. Their total number is substantial – almost 120,000 – indeed, many more than franchise buses.⁵² Our previous strategy was to get commercial goods diesel vehicle owners to fit low cost particulate traps or the more expensive catalytic converters to pre-Euro vehicles. Since December 2003, all pre-Euro light diesel vehicles (under 3.5 tons) must by law have installed either one or the other to reduce emissions.⁵³ Since April 2006, all pre-Euro medium and heavy diesel vehicles (over 3.5 tons) must by law be retrofitted with catalytic converters, and the mandatory regulation will shortly also be extended to long idling pre-Euro heavy diesel vehicles (such as concrete mixers, vehicles with working cranes etc).⁵⁴

Comparison of Vehicle Exhaust Emission Standards Large Diesel Vehicles (>3.5 Tonnes)



⁵¹ Albert Wong, “Bus air-con gives medics the chills”, *The Standard*, 18 August 2006, p.M3.

⁵² As at June 2006, there are 598,988 registered motor vehicles in Hong Kong. Out of this, there are 119,500 light, medium and heavy goods vehicles running with diesel engines. It represents some 85% of Hong Kong’s entire diesel vehicular fleet.

⁵³ The government provided HK\$50.88 million in 2000 as a one-off grant to assist owners of light diesel vehicles to retrofit vehicles with cheap mechanical filtration particulate traps with 30% efficiency that required regular cleaning, where apparently 40,000 vehicles (including diesel taxis) qualified, see LegCo Paper CB(1) 769/01-02(01), 14 January 2002.

⁵⁴ The government provided HK\$600 million in 2002 to retrofit medium and heavy vehicles with catalysts with 35% efficiency, and HK\$70 million in 2004 for long-idling vehicles, see LegCo Paper CB(1) 1885/03-04(03), 24 May 2004, and reply to LegCo Question no. 11, 6 April 2005.

D. Reducing Local and Regional Air Pollution (continued)

57. However, we must press ahead to now incentivise transport operators to replace these pre-Euro and even Euro I vehicles as quickly as possible, as they remain a greater threat to public health. We are prepared to subsidise vehicle owners when they buy a new vehicle, as we have done in the past with subsidising particulate traps and when taxi and light bus owners switched to LPG or electric vehicles.⁵⁵

58. Low Emissions Zone Proposal: We will put forward a consultation paper shortly to turn the whole of Hong Kong into a Low Emissions Zone. The policy goal here is to implement the 'polluter pays principle' to reduce road transport emissions by accelerating the introduction of cleaner vehicles and reducing the number of more polluting vehicles within the zone.

59. Under the proposals, from 2010, vehicles will have to meet at least Euro II standards or pay a substantial daily charge to drive within Hong Kong in addition to a penalty.⁵⁶ This policy will have the greatest impact on the oldest commercial diesel vehicles including franchise buses. If the remaining newer vehicles were fitted with high quality particulate filters, they could reduce particulate emissions further to meet Euro IV standards. We will see how to incentivise them to do so sooner rather than later. By 2012, our goal is to only have Euro III or better vehicles on our roads.

(3) Light Buses (mini buses)

60. In August 2002, we started to encourage the early replacement of public light buses to LPG or electric ones by offering a one-off grant of HK\$60,000 or HK\$80,000 for each diesel public light bus that was replaced with an LPG or electric one respectively. By today, over 55% of the registered public light buses are LPG and over 80% of newly registered public light buses are LPG ones. We will continue to push ahead with replacing these vehicles.

(4) Taxis:

61. Today, all our 18,000 taxis are LPG ones.⁵⁷ Our goal is to work with the trade to ensure these vehicles are well-maintained and replaced at the appropriate time. Education and training is therefore important.

55 There had been concern in the past about the amount of subsidy. In 2002, the Gateway Cities Clean Air Program in Southeast Los Angeles County offered an average subsidy of between US\$20,000-\$25,000 against the cost of a new truck that typically costs about US\$35,000.

56 London put forward a consultation paper in January 2006 to turn the whole of Greater London into a Low Emissions Zone from 2008 where trucks, lorries, coaches and buses have to meet Euro III standards or face heavy charges. The proposed charges ranged between £100 and £200 for the daily charge and between £500 and £1,000 for the penalty. A revised paper is now in circulation for a 2nd round of consultation, see *Transport and Air Quality Strategy Revisions: London Low Emission Zone*, Transport for London, July 2006, www.tfl.gov.uk

57 In 2000, the government provided a subsidy of HK\$40,000 for each replacement of a diesel taxi to switch to LPG.

D. Reducing Local and Regional Air Pollution (continued)

(5) Vehicular Fuels

62. In 2000, Hong Kong was the first city in Asia to introduce ultra low sulphur diesel (ULSD – sulphur 50 ppm or 0.005%) and it is the only motor diesel fuel available today. To ensure its wide usage, we have continued to give a concessionary duty even though it is a more expensive fuel. Since January 2005, we have also tightened the sulphur content in unleaded petrol from 0.015% to 0.005%.

63. Apart from making it easier for Hong Kong to adopt cleaner fuels (such as ethanol, bio-diesel, see Appendices V to IX), the HKSARG will continue to crack down hard on the illicit 'de-treated oil' business.⁵⁸ Unfortunately, due to the price differential between ULSD and illicit diesel, drivers continue to be tempted by using poor quality fuels despite knowing full well the illicit fuel is much more polluting.⁵⁹

64. Another aspect of our problem is that commercial goods vehicles that run between Hong Kong and the Pearl River Delta often load-up on cheaper and low quality fuels (0.2% sulphur) in their tank before returning to Hong Kong. Indeed, they are legally allowed to bring back a tank that is 75% full. We need discourage drivers from loading-up their tanks on the other side of the border by providing fuel depots on the Hong Kong side of the border and consider some kind of rebate scheme for fuel purchased at the border [By 2008].

⁵⁸ De-treated oil is in essence diesel with higher emissions used for marine and industrial usages, which is red in colour because it has been 'marked' by a colouring to distinguish it from motor diesel. A 'de-treating' process takes the red colour out so make it harder to distinguish from motor diesel, see *Control of Illicit Oil*, Customs and Excise Department, March 2003, www.customs.gov.hk/eng/notice_diesel_e.html and *Customs to launch anti-illicit fuel campaign*, 29/3/05, www.customs.gov.hk/eng/new_release_20050329_anti_illicit_fuel_e.html.

⁵⁹ The Customs and Excise Department handled 1,515 cases concerning illicit fuel and seized 1.173 million litres of fuel with a total value of HK\$11.6 million and arrested 960 people in 2005.

D. Reducing Local and Regional Air Pollution (continued)

IV. Rail Expansion

65. Although Hong Kong has a rail-led transport policy, I must admit we are building roads faster than we are building railways. Compared to cities such as London, New York, Tokyo and Paris, our rail network is very much thinner. The reason has to do with the way railways are financed. In many other cities, the building of rail-lines is seen as an essential public service and governments subsidise them directly. In Hong Kong, we have provided indirect subsidies through giving land to the rail companies to build commercial and residential properties, which they could then sell or rent out to pay for the costs of building and operating the railways. I see no reason why the HKSARG cannot directly subsidise the capital cost of building or extending rail-lines because rail services is more environmentally-friendly than road transport. When the full external costs and benefits are taken into account, the direct subsidies can be fully justified to cover capital costs.⁶⁰

66. As such, we should expedite the building of the South Island Line, the North Island Line, the Shatin-Central Line, and the Northern Link.⁶¹ With the imminent merger of the Kowloon Canton Railway Corporation and the MTR Corporation,⁶² I have asked the Secretary for Environment, Transport and Works and the Secretary for Financial Services and the Treasury to work with rail managers to draw-up a plan within a year for public release so as to get on with extending Hong Kong's rail network, as well as to ensure proper designs for rail-road interchanges to facilitate smooth transfer for passengers.

60 Bill Barron, Simon Ka-wing Ng, Christine Loh and Richard Gilbert, "Road versus Rail – Financing Mass Transit", Chapter 3 in *Sustainable Transport in Hong Kong: Directions and Opportunities*, Civic Exchange and The Asia Foundation, June 2002, www.civic-exchange.org/publications/03publication/ST_HK-book.pdf

61 Bill Barron, Simon Ng, Betty S F Ho and Clarence Chan, *West Island Line/South Island Line: Direct External Benefits*, The Centre of Urban Planning & Environmental Management, University of Hong Kong; Civic Exchange; and PlanArch Consultants Ltd, March 2004; and Bill Barron, Simon Ng, Betty Ho, Simon Ogus and Andrew Taylor, *Selected Employment Benefits: West Island Line/South Island Line*, Civic Exchange; The Centre of Urban Planning & Environmental Management, University of Hong Kong; and PlanArch Consultants Ltd, May 2004, www.civic-exchange.org/publications/2004/WIL%20SIL%20Employment%20Report_English%20Full.pdf

62 Civic Exchange has emphasized the merger should enable the HKSARG to implement a rail-led transport policy more effectively, *Merging Hong Kong's Railway: The Public Interest Perspective*, December 2004, www.civic-exchange.org/publications/2004/railmerger%20-%20E.pdf

D. Reducing Local and Regional Air Pollution (continued)

V. Shipping and Port Operations

67. In absolute volumes, marine activities contribute less to our air pollution than power plants or vehicles. However, marine emissions in Hong Kong are increasing from year to year and the emissions are emitted close to ground level and near densely populated areas in Kowloon. Moreover, ocean-going vessels are legally able to use high sulphur bunker fuels with sulphur content up to 4.5%, which also has high elemental carbon and vanadium contents that are harmful to human health.⁶³ We have a duty to act now because marine emissions represent a significant public health treat to a large number of our residents.

68. In the short-term [2008-2009], the HKSARG will work with industry stakeholders to implement voluntary programmes to reduce emissions. These could include:

Using lower sulphur fuels on vessels' propulsion and auxiliary engines within Victoria Harbour;

Reducing the speed of vessels within the harbour;

Using the latest technologies in emission abatement (such as catalytic reactors, scrubbing, slide valves and fuel additives);

Tapping shore-side power on ships while they are docked at port rather than continue to burn bunker fuel;

Using emission control technology on port handling equipment and considering other measures to reduce land-based emissions at port and around port areas.

69. For those companies prepared to take part in these programmes, we are prepared to consider discounts in port fees and tariffs, financial grants for retrofitting vessels and engines, priority berthing and commendation awards.

70. Hong Kong will also shortly [2006-2007] ratify Annex VI of the International Convention for the Prevention of Marine Pollution for Ships, more commonly referred to as the MARPOL Convention. Annex VI came into force in May 2005 and governs prevention of air pollution from ships. Ratification is a pre-condition for Hong Kong to apply for our port to be a Sulphur Emission Control Area (SECA) with more stringent controls on sulphur emissions. We can then require ships coming to Hong Kong to use fuels not exceeding 1.5% in sulphur.⁶⁴

71. In the longer-term, the HKSARG will put together a Green Port Policy for public consultation in 2007 (paragraphs 77-79).

63 For a full discussion of the subject, see Caitlin Gall and Marcos van Rafelghem, *Marine Emission Reduction Options for Hong Kong and the Pearl River Delta Region*, Civic Exchange, March 2006, www.civic-exchange.org/publications/2006/marineemission-e.pdf. California's Air Resources Board works closely with the California Business, Transportation & Housing Agency (BT&H) and the California Environmental Protection Agency (Cal/EPA) to bring all industry stakeholders together to discuss and address issues regarding improving the movement of goods and reducing its environmental impacts in California. Its website contains rich information on how ports and logistics operators can reduce emissions, see www.arb.ca.gov/gmp/gmp.htm

64 For a detail discussion about the MARPOL Convention and SECAs, see Caitlin Gall and Marcos van Rafelghem, *Marine Emission Reduction Options for Hong Kong and the Pearl River Delta Region*, Civic Exchange, March 2006, pp. 17-21, www.civic-exchange.org/publications/2006/marineemission-e.pdf

D. Reducing Local and Regional Air Pollution (continued)

VI: Airport Operations

72. I am also going to ask the Airport Authority to study how the operation of the Hong Kong International Airport can observe the highest sustainability principles so that it can also do its part in energy efficiency and emissions reduction.

Fighting Regional Air Pollution and Collaboration with Guangdong

73. The HKSARG already has a collaborative framework with Guangdong to reduce air pollution (paragraph 27 and Appendix IV). Our new ideas are as follows:

74. Focus on manufacturing: As the Guangdong authorities continue to put pressure on the manufacturing sector in the Pearl River Delta to clean-up and comply with national environmental regulations,⁶⁵ the HKSARG will collaborate with Guangdong to actively and systematically encourage the Hong Kong-based manufacturers to become more energy sensitive, as well as to meet regulations across the border. I believe there are potential opportunities to make a real difference here. The HKSARG should focus on how we can play a role in gathering the technical know-how from local and international experts to help our manufacturers do energy audits of their enterprises. We stand ready to provide financial assistance to expedite the transit of Hong Kong businesses to become much more energy efficient.

75. We will begin our work by putting early emphasis on Hong Kong manufacturers in Shenzhen and Dongguan because emissions from there have the greatest impact on us before reaching out to those operating elsewhere in the Pearl River Delta [2006-2007].

76. We have been discussing within the HKSARG how we should encourage corporate transparency and responsibility in the environmental area. We are considering mechanisms such as requiring compulsory environmental and sustainability reporting for Hong Kong-registered companies that manufacture in Guangdong. This way, we can improve the transparency of their environmental performance thereby helping to influence a faster evolution of our businesses to achieve sustainability. I wish to share this idea with you and gather public reactions to it [2007-2008].⁶⁶

77. Focus on shipping, port operation and logistics: We will likewise actively and systematically encourage ship owners, ship liners, port operators and the logistics sector to look at ways to clean-up. The various measures I already discussed to reduce emissions from medium and heavy diesel vehicles will help, as most of them are involved in cross-border runs (paragraphs 46 and 56-59).

78. In the longer-term, the collective aim of the HKSARG and the Guangdong and Shenzhen authorities is to implement a Green Port Policy for all the ports in the region. As the Hong Kong shipping, port operation and logistics sectors have invested heavily in the Shenzhen ports, synergies exist and regional collaboration should be possible.

79. At an even more ambitious level, the HKSARG and the Guangdong authorities are exploring with the Central People's Government for China to also ratify Annex VI of the MARPOL Convention so that we can declare the entire waters of Hong Kong, Macau and the Pearl River Delta a Sulphur Emission Control Area (SECA) at an appropriate time when we have our regional Green Port Policy in place. This will be an important move for the South China region to achieve sustainable development in the longer-term.

65 Anita Lam, "Guangdong takes new steps to cut pollution", *South China Morning Post*, 1 August 2006, P. A3, reports the authorities had closed 1,500 factories in three years and subsidised power plants to upgrade.

66 This idea was proposed by the British General Chamber of Commerce's *Hong Kong Policy Priorities 2006-2007*, 14 August 2006, www.britcham.com/asp/ArticleDetail.asp?ArticleID=307

D. Reducing Local and Regional Air Pollution (continued)

80. Focus on using cleaner fuels in Shenzhen and Dongguan: The cleaner the fuels we use, the lower the emissions. If we can find an early way to encourage manufacturers in Shenzhen and Dongguan to use cleaner fuels to run their private generators, this will produce an immediate beneficial impact for Hong Kong.⁶⁷

81. I will work with the mayors of Shenzhen and Dongguan to explore how manufacturers producing for export within their jurisdictions can access cleaner fuels – perhaps even ULSD – to run their private generators. This may require more fuels to be imported. Such arrangements will no doubt be complicated to establish but it is worth exploring to see if we can benefit from a quick win.

82. Improve regional air quality management: Hong Kong and Guangdong has our joint Pearl River Delta Regional Air Quality Management Plan (2002) to build upon. We have a joint regional air monitoring network in place, which started reporting on 30 November 2005 that can be accessed via the Internet.⁶⁸ We have also agreed to report every 6 months on the monitoring results of the major pollutants.⁶⁹

83. In 2007, the public will be able to access real-time from the internet air quality data of each pollutant from each monitoring station. This will enable the scientific community to provide advice to Hong Kong and Guangdong on better air quality management, as well as put our region on a firm footing to creating a transparent regulatory system that is needed for emissions trading in the future.⁷⁰

84. Hong Kong, Macau and Guangdong will continue to collaborate on joint air quality research, as well as focus on building-up and expanding the human resource potentials and capacities for a regional air monitoring authority that can be implemented in phases from 2010.⁷¹

85. Our efforts so far in this area have already provided the leading national example for better regional air quality management. Our further efforts represent a significant scientific and regulatory innovation for China as a whole, the long-term benefits for which will be significant in promoting sustainable development.

67 For a full discussion, see Bill Barron, Simon Ng Ka Wing and Ben Lin Chubin, *Owning up to Responsibility for Manufacturing Contributions to the Pearl River Delta's Poor Air Quality*, Institute for the Environment, Hong Kong University of Science and Technology and Civic Exchange, March 2006, www.civic-exchange.org/publications/2006/prdenergy.pdf

68 PRD Regional Air Quality Index, access via www.epd.gov.hk

69 It was announced on 2 August 2006 that both sides would announce their first half-yearly report on monitoring results, HKSARG Press Release, *Ninth Plenary of HK-Guangdong Co-operation Joint Conference held today*, 2 August 2006, www.info.gov.hk/gia/general/200608/02/P200608020264.htm

70 In Civic Exchange's *White Paper on Air Quality Management Issues in the Pearl River Delta Region*, November 2004, we called for progress reports of the reduction targets, the setting-up of a regional air monitoring network and build regional capacity for improving air quality management www.civic-exchange.org/publications/2004/airpollutionwhitepaper.prd

71 Ibid.

E. Facilitating Industries to Reduce Emissions

86. I will personally oversee the design of a programme to be implemented in 2007 where the HKSARG will invite, engage and facilitate various sectors to come together to discuss how they can reduce energy consumption, increase energy efficiency, and reduce air pollution. Some of these discussions we can have within Hong Kong, while others we need to work with stakeholders from or operating across the border.

87. I have already identified a number of sectors which are critical to the success of our new Air Management Plan – these include: power generation, transport, manufacturing, port and airport operation and logistics,⁷² infrastructure design and construction, as well as building design, construction and management.

88. Beyond specific industry sectors, we must also work with the community since energy consumption, improving energy efficiency and reducing air pollution affects everyone.⁷³ We will also have a programme of public education and engagement concerning these matters to be rolled out in 2007 and 2008.

F. Joining National and International Efforts

National Energy Goals

89. Improving energy efficiency is now a key national goal that cuts across economic, environmental and social policies. Therefore, as part of the Chief Executive's Economic Summit to consider the national 11th Five Year Plan,⁷⁴ I am giving particular emphasis to the issue of energy to ensure that we in the HKSARG, as well as the private sector, are fully aware of the national policies relating to energy. Moreover, I hope that our own efforts to devise a new Energy Policy will contribute to the national effort.

90. I will explore with the Central People's Government whether it may be possible for the HKSARG to join the Chinese Delegation to attend international climate change meetings so that we can learn more quickly about how Hong Kong can take advantage of our position as a finance centre to take the lead in developing and financing renewable energy and Clean Development Mechanism projects in China,⁷⁵ especially focusing on implementing these projects in South China. At the same time, I would expect the Hong Kong Exchanges and Clearing Limited to be also doing its homework on what role it can play.

⁷² Hong Kong's logistics industry came together to discuss how to find solutions to common problems using the Creative Initiative's method of gathering ideas ahead of a series of facilitated deliberative gatherings. Therefore, the sector already has the experience of coming together and thus could be brought together again to explore how they can operate at a higher level of energy efficiency and environmental impact.

⁷³ Hong Kong has had many town hall-style gatherings on many issues. There is sufficient local capacity to provide continuous improvements to design and facilitate such gatherings to enhance deliberation and dialogue. Civic Exchange sees the design and facilitation of large and small gatherings as a core competence in management, whether in the public or private sector, and refers to these skills as *sustainability tools*, see our publications by Christine Loh, *An Introduction to Sustainability Tools: using effective public dialogue to improve government-civil sector relations*, March 2002, www.civic-exchange.org/publications/2002/Sustainability%20Tools.pdf; *Promoting Sustainability Tools: Connecting Thinking and Dialogue Skills*, January 2003, www.civic-exchange.org/publications/2003/Promoting%20Sustainability%20Tools.pdf; and *Applying Sustainability Tools: Exploring Constitutional Development (2003-2004)*, January 2005, www.civic-exchange.org/publications/2005/Applying%20Sustainability%20Tools.pdf

⁷⁴ Closed-door meeting on 11 September 2006.

⁷⁵ Such as meetings related to the United Nations Framework Convention on Climate Change (Kyoto Protocol).

F. Joining National and International Efforts (continued)

National Air Quality Projects

91. There are also national air quality research projects that the HKSARG and the private sector in Hong Kong can immediately help fund, and where our scientists can participate. Indeed, our scientists (including those at the Environmental Protection Department) are well-known nationally, as they have recognised expertise. One such project concerns the famous Mogao Grottoes at Dunhuang. It is important for Hong Kong to help fund and conduct sampling and carry out analyses of air quality in the caves with a view of assessing the relationship between air pollution and damage to antiquities. We all have an interest for these caves to be properly preserved. They are not only of national historical and cultural importance but Dunhuang is a World Heritage site.⁷⁶

International Participation

92. At the international level, Hong Kong will join the International Council for Local Environmental Initiatives (ICLEI) within the next 6 months so that we can be part of a wider network of cities from around the world to help reduce air emissions, including carbon dioxide.⁷⁷

93. Moreover, I have noted with interest the creation in October 2005 of the Large Cities Climate Leadership Group chaired by London's Mayor, Ken Livingston, to reduce carbon emissions. I also note that on 1 August, the Group signed a memorandum of understanding with the William J Clinton Foundation to join the Clinton Climate Initiative. The consortium of cities will use their collective influence to leverage their purchasing power to buy energy-saving products more cheaply, offer expert technical assistance to cities trying to reduce their carbon emissions, and speed up the development and deployment of "green" technologies and products.⁷⁸ Hong Kong is making enquiries to join this effort.

94. I also note that Britain and California have agreed to explore the possibility for a new trans-Atlantic market in carbon emissions and other greenhouse gases. They will explore the viability of an emissions trading scheme, where the idea is to set overall caps for carbon and reward businesses that find a profitable way to minimise carbon emissions, so encouraging greener technologies.⁷⁹ I have asked our officials to keep a watching brief on developments. As Hong Kong, Macau and Guangdong progress in developing our emissions reduction programme, it may well be that our region can tap the expertise of others and perhaps even be a part of the Britain-California-South China emissions trading system. There are obviously many things still to work out but we should join with others to expedite the transformation of our region and also the world to fight climate change and to achieve sustainable development.

⁷⁶ Dunhuang was an important town on the Silk Road. Located 25 km away are the Mogao Grottoes (Caves of One Thousand Buddha) with murals and sculptures made between the 4th and the 14th centuries. There are almost 500 caves, decorated with 45,000 sq meters of frescoes and over 2,000 painted statues. In 1900, a cave containing 50,000 religious and historical manuscripts was found at Dunhuang. In 1987, the Mogao Grottoes were listed as a World Heritage Site by UNESCO. These caves need protection from air pollution and sampling and analyses need to be done to determine how the caves can best be protected.

⁷⁷ ICLEI's Eco-Efficient Cities and Cities for Climate Change campaigns encourage and provide technical support to municipal members to devise policies enhancing livability of urban areas and cut carbon emissions. ICLEI now has a case bank with examples of air quality, energy efficiency and eco-mobility projects worldwide. See www.icei.org

⁷⁸ There are 22 member cities (including London, Los Angeles, New York, San Francisco, Chicago, Philadelphia, Mexico City, Delhi, Cairo, Seoul), see *Clinton rallies support for global warming initiative*, 15 August 2006, www.today.ucla.edu/2006/060815news_clinton.html. The alliance between the Clinton Foundation and the Large Cities Climate Leadership Group is being funded by a US\$3-million grant from actress Barbra Streisand, Rupert Murdoch, and Anson M. Beard Jr., an investor in New York. One report also said Beijing was involved, Michael Blood, Associated Press, "Clinton in climate alliance", *The Standard*, 3 August 2006, p.A11.

⁷⁹ George Jones, "Blair cuts out Bush in deal with Schwarzenegger to set up carbon trading scheme", *Telegraph*, 1 August 2006.

Air Management Plan Timeline

	2006	2007	2008	2009	2010	2011	2012
Sharpen Policy Tools		New Energy Policy : Energy efficiency through public procurement (2007 onwards); Revise Schemes of Control (2007-2008); Appoint new ministerial post (2007); Promote District Level Energy Efficiency Campaign (2007 onwards)					
		Air Quality : Tighten AQOs (2007) Recalibrate API (2007) Start Air Pollution Alerts (2007)					
A Comprehensive Approach (Local Air Pollution)		Power Generation : Impose Lamma Power Station emissions cap (2006); Announce fuel mix policy (2006-2007); Secure LNG supply (2007); Explore emissions trading					
		Vehicular Transport : Devise strategy for cleaner vehicles and fuels (2007); Practice better planning and urban design (2007-2008); Legislate to stop idling engines (2007-2008); Tax and license according to emissions (2007); Promote biodiesel and ethanol (2007); Discounts to cross-border vehicles that refuel at border (2008); Start electronic road pricing (2008-2009); Impose emission caps on bus companies (2008-2009); Replace Pre-Euro and Euro I buses (2010); Pre-Euro and Euro I vehicles off the road (2010); Create Low Emissions Zone (2010); Only Euro III or better vehicles on the road (2012)					
		Expedite Railway/Subway Expansion : South Island Line, North Island Line, Shatin-Central Line; the Northern Link (2007 onwards)					
		Shipping and Port Operations : Reduce vessel speed in harbour (2006); Use lower sulphur fuels (2007) Promote latest technologies in emission abatement (2007 onwards); Shore-side power for ships at dock (2007) Tariff concessions, financial support and other incentives (2007-2008); Ratify Annex VI MARPOL Convention (2006-2007) so HK may be declared a Sulphur Emissions Control Area in the future					
A Comprehensive Approach (Regional Air Pollution)		Manufacturing : Promote use of cleaner fuels for private generators in Shenzhen and Dongguan.					
		Ports, Shipping and Logistics : Devise Regional Green Port Policy (2008-2009) Request Central People's Government ratify Annex VI of MARPOL so PRD waters may be declared a Sulphur Emissions Control Area (2009-2010)					
		Air Quality Management : Provide real time air quality data (2007); Fund joint HK-Macau-PRD air quality research and collaboration, Create Regional Air Resources Board (2012)					
Pro-actively Facilitate Industries to Reduce Emissions		Facilitate Industry Sectors to become Energy Efficient and Reduce Emissions (2007-2008) : Power generation; Transport; Manufacturing Port and Airport operation and logistics; Design and construction					
National and International Efforts	Participate in National and International Efforts (2006 onwards) : Safeguard national treasures (e.g. Magao Grottoes, Dunhuang) Join International Council for Local Environmental Initiatives (ICLEI) Join Large Cities Climate Leadership Group						

Comparison of International Air Quality Standards

Pollutant	Averaging Time	WHO (2000)	WHO (2006)	United States	California	European Union	Hong Kong	China
(Concentration in $\mu\text{g}/\text{m}^3$)								
Sulphur Dioxide (SO₂)	10 mins	500	500	-	-	-	-	-
	1 hour	-	-	-	655	350	800	500
	24 hours	125	20	365	105	125	350	150
	annual	50	(a)	80	-	20	80	60
Nitrogen Dioxide (NO₂)	1 hour	200	200	-	470	200 (b)	300	240
	24 hours	-	-	-	-	-	150	120
	annual	40	40	100	-	40 (b)	80	80
PM₁₀	24 hours	-	50	150	50	50	180	150
	annual	-	20	50	20	40	55	100
PM_{2.5}	24 hours	-	25	65	-	-	-	-
	annual	-	10	15	12	-	-	-
Ozone (O₃)	1 hour	-	-	-	180	-	240	200
	8 hours	120	100	157	137	-	-	-

Notes:

(a) no need for an annual guideline as compliance with the 24-hour level will assure low levels for the annual average.

(b) to be met by 1 January 2010.

Sources: WHO; USEPA; CARB; HKEPD; EU

Enhanced Air Pollution Control Measures of the HKSARG

Measures	Implementation Programme	Progress (Up to 2005)
Encourage the replacement of diesel light buses (PLB) with cleaner fuel ones.	Since 2002, the HKSARG has offered incentives to PLB owners to encourage replacement of diesel light buses with liquefied petroleum gas (LPG) or electric ones.	An incentive scheme has been introduced since August 2002. Up to October 2005, there were 2,361 public LPG light buses, 117 private LPG light buses and 1 electric light bus. Over 80% of the newly registered PLB run on LPG. The incentive scheme ended at the end of 2005.
Require the retrofitting of particulate removal devices on pre-Euro diesel vehicles.	Require the retrofitting of particulate removal devices on pre-Euro diesel vehicles.	<p>Financial assistance was provided in phases from December 2002 to December 2004 to over 34,000 non-long-idling pre-Euro heavy diesel vehicles retrofitting with catalytic converters. The HKSARG is proposing legislation to require the installation of approved emissions reduction devices on these vehicles.</p> <p>A programme for the installation of particulate removal devices for about 3,300 long-idling pre-Euro heavy diesel vehicles (including lorries with cranes mounted, concrete mixers, pressure tankers and gully emptiers) started June 2005. Upon completion of the programme by end December 2005, the HKSARG intends to introduce legislation to require the installation of approved emissions reduction devices for these vehicles.</p> <p>Besides, all pre-Euro franchised buses have been installed with catalytic converters to reduce the emission of particulates.</p>
Enhance the vapour recovery systems in petrol filling stations.	Legislation requiring the recovery of petrol vapour emitted during vehicle refuelling at petrol filling stations was introduced in 2003/04.	The Regulation came into effect on 31 March 2005.

Enhanced Air Pollution Control Measures of the HKSARG

.Measures	Implementation Programme	Progress (Up to 2005)
Tighten motor fuel standards	Motor fuel standards will be tightened to Euro IV by 2005 (motor diesel standard has already been tightened to Euro IV since 2002).	Euro IV motor fuel standards came into effect on 1 January 2005.
Tighten tailpipe emission standards	To adopt Euro IV standards for tailpipe emissions from 2006.	Euro IV standards introduced on 1 January 2006 for tailpipe emissions.
	To be in line with EU in adopting Euro V standards for tailpipe emissions.	Euro IV standards introduced on 1 January 2006 for tailpipe emissions.
Reduce VOC emissions from the printing process, paints and consumer products.	<p>Phase I: To introduce legislation in 2004 or 2005 to require labelling of VOC-containing products.</p> <hr/> <p>Phase II: To introduce legislation in phases to reduce the use of products with high VOC contents and to impose emission standards for the printing process.</p>	During public consultation held in September 2004 and subsequent discussions with stakeholders, members of the trade generally agreed advance Phase II and impose limits on the VOC content of VOC products, and to set appropriate levels and technical details at an earlier date. Law drafting work has commenced and the legislative process is expected to complete in mid 2006. All VOC-containing products under control will be subject to the statutory limits in phases with effect from 2007

Enhanced Air Pollution Control Measures of the HKSARG

Measures	Implementation Programme	Progress (Up to 2005)
Reduce emissions from power stations.	Effective and flexible mechanisms (which may include emissions trading) will be set up to control the total emissions of SO ₂ , NO _x and RSP from power stations to achieve respective reduction targets by 2010.	The emissions reduction options set out in the financial plans of the two power companies were approved by the Government in June 2005. CLP Power Hong Kong Limited will provide desulphurization and de-NO _x systems for four of its coal-fired generating units each of 677MW. Hong Kong Electric Co. Ltd. Will provide low-NO _x burners and desulphurization systems for two of its coal-fired generating units each of 350MW. In order to achieve the 2010 emissions reduction targets, HKSARG will continue discussions with the two power companies on other options, including the speeding up of emissions reduction projects and participation in emissions trading etc. Furthermore, CLP will increase the use of ultra low sulphur coal and seek to increase natural gas supply through the development of liquefied natural gas facilities.
	Introduce caps on total emissions from power plants.	An emission cap has been included in the licence for CLP's Castle Peak Power Station starting from 1 August 2005. EPD will continue to introduce emission caps on power plants upon licence renewal with a view to gradually reducing emissions to the level set for 2010.

Enhanced Control Measures of the Guangdong Provincial Government

Measures	Implementation Programme	Progress (Up to 2005)
Use cleaner energy.	To reduce gradually the energy consumption per 10,000 Yuan GDP. To establish by 2010 a diversified energy production and supply system that is safe, stable, economical, efficient and clean.	Work in progress.
	To construct liquefied natural gas (LNG) trunk pipeline and carry out the associated works. To complete Phase I in 2005 that will have a capacity of 3 million tonnes/year and finish construction of a number of LNG power plants.	Phase 1 works are expected to be completed in 2006 and the four LNG power plants at Daya Bay in Huizhou, Shenzhen East, Qianwan in Shenzhen and Zhujiang in Guangzhou are under construction as scheduled.
	To improve by 2005 the 500KV dual circuit annular core transmission grid to ensure transmission of electricity from western provinces.	The 5 AC 3 DC main transmission channels from western provinces have been completed.
Control the sulphur content of fuel.	To control the use of high sulphur fuel (sulphur content of coal and fuel oil should be below 0.8% in the acid rain control zone by 2005).	Being implemented.

Enhanced Control Measures of the Guangdong Provincial Government

Measures	Implementation Programme	Progress (Up to 2005)
Reduce emissions from coal-fired and oil-fired power stations.	To phase out small-scale thermal power generating units. Power plants with a capacity of over 300MW to account for over 70% of the total installed capacity in the region in 2005, which is 35% higher than that in 2000.	Expected to be completed in 2007 due to electricity demand well exceeding estimation.
	To install flue gas desulphurization systems at the power plants in Shajiao, Huangpu, Taishan and Zhuhai by 2005.	Flue gas desulphurization systems installed in Shajiao Power Plant A (Unit 5), Shenzhen Xibu Power Plant (Units 4, 5 and 6), Guangzhou Hengyun Power Plant, Guangzhou Ruiming Power Plant, Guangzhou Power Plant, Yuancun Thermal Power Plant Boiler 2, Guangzhou Papermaking self-use thermal plant and Taishan Power Plant Units 1 and 2. Flue gas desulphurization systems are being retrofitted to all other generation units.
	To require all oil-fired and coal-fired generation units of capacity above 125MW to be equipped with flue gas desulphurization systems by 2007.	
	To require all coal-fired and oil-fired power plants to adopt low-NO _x combustion technologies in case of alteration or expansion.	

Enhanced Control Measures of the Guangdong Provincial Government

Measures	Implementation Programme	Progress (Up to 2005)
Control emissions from industrial boilers and industrial processes.	To phase out coal-fired boilers with a capacity of less than 2 tonnes/hour in the urban areas of cities. By 2005, to stop using such coal-fired boilers in build-up areas of key cities. To require all large and medium-sized industrial boilers to install desulphurization systems or adopt clean combustion technologies to reduce emissions.	Have generally phased out and stopped the operation of coal-fired boilers of less than 2 tonnes/hour in the urban areas of cities in the region.
	To continue phasing out various production technologies and installations that have caused serious pollution by emitting sulphur dioxide, smoke and particulates.	Work in progress.
	To actively study the technologies for controlling emission of nitrogen oxides from stationary sources such as power plant boilers, industrial boilers and restaurant boiling water furnaces.	
Reduce the emission of VOC from paints.	To replace by 2003 paints using VOCs like xylene and solvents.	Work completed.

Enhanced Control Measures of the Guangdong Provincial Government

Measures	Implementation Programme	Progress (Up to 2005)
Reduce tailpipe emissions from motor vehicles.	To commence the construction of a regional rapid light-rail system by 2005. To construct expressways in major cities, such as the district expressway in Southern Guangzhou and the Shenzhen-Shenping Express Trunk Road.	The "Planning of the Transport Routes for Inter-City High Speed Railway Network in the PRD Region (2005-2020)" was endorsed by the State Council in March 2005 and incorporated into the State's medium to long term railway network planning. The Pearl River Delta High Speed Transportation Network Project has started.
	To develop green transport by implementing clean vehicle action programmes in major cities of the region. To encourage the use of clean fuels, develop electric vehicles and actively promote the use of advanced clean fuel motor vehicles.	<p><u>Shenzhen</u></p> <ul style="list-style-type: none"> • Formulated the "Medium to Long Term Planning for the Development of Clean Vehicles in Shenzhen". Drew up and implemented the 2003-2008 general work programme for the use of clean fuel in public transport vehicles. 2000 public buses will be replaced by Euro III vehicles by end 2005. • All public transport vehicles must use diesel with sulphur content of less than 500 ppm. • Introduction of motor diesel with sulphur content of less than 500 ppm. • Preparations for promoting installation of vapour recovery systems at petrol filling stations being pursued. <p><u>Guangzhou</u></p> <ul style="list-style-type: none"> • Motorcycles are prohibited from using certain road sections in the urban areas. Introduction of motor diesel with sulphur content of less than 500 ppm. • Active promotion of LPG public transport and hired vehicles. As at 30 May 2005, there were 3,547 LPG public transport vehicles and 8,100 LPG hired vehicles.

Enhanced Control Measures of the Guangdong Provincial Government

Measures	Implementation Programme	Progress (Up to 2005)
Reduce tailpipe emissions from motor vehicles.	To require all new motor vehicles to fully meet emission standards. To step up annual inspection and on-road spot checks of in-use vehicles. To strengthen the control of in-use vehicles to ensure that over 90% of motor vehicles in the cities within the region will meet tailpipe emission standards by 2005.	<p>National II emission standards have already been adopted since 1 July 2005, and will strive to adopt national III standards by end 2006.</p> <p><u>Shenzhen</u></p> <ul style="list-style-type: none"> All newly registered public transport vehicles are required to comply with the National III emission standards. Established the reporting and joint investigation system for smoky vehicles. Implemented the I/M system. Adopted a labelling system on the environmental categorization of motor vehicles. <p><u>Guangzhou</u></p> <ul style="list-style-type: none"> Initiated control actions against smoky motor vehicles.

Action Plan for Introducing New Clean Vehicles and Fuels Technologies in Hong Kong

Short-term Actions				
Action	What	When	Who Must Act	Ideas on How
Encourage vehicle dealers to import alternative technology vehicles.	Create incentives for bringing cleaner vehicles into Hong Kong.	ASAP	TD, FSTB, Customs & Excise Department, vehicle dealers and manufacturers.	<p>Expedite type approvals and/or waive costs for procuring type approvals for low emissions vehicles.</p> <p>Waive custom duties, if any, and import fees for low emissions vehicles.</p>
Encourage scrapping of older vehicles which tend to emit more pollutants.	Create incentives to scrapping older vehicles and disincentives (or outright prohibition) to retaining them.	ASAP	TD, HKEPD, LegCo.	<p>Ban all vehicles of a certain age or that are unable to achieve established emissions levels.</p> <p>Pay incentive premiums for people to retire diesel vehicles at 8-10 years, like those presently applied to petrol vehicles.</p> <p>Increase annual license fee for older vehicles.</p>
Introduce biofuels and make them widely available.	Set standards for biodiesel, create and implement a plan for biodiesel distribution. Encourage importation of biodiesel and local production of biodiesel from waste vegetable oils and animal fats.	ASAP	ETWB, TD, HKEPD, FSD, biofuel proponents, oil companies.	<p>Set quality standards.</p> <p>Relax Fire Safety Ordinance classification for biofuels and allow distribution from mechanics garages like motor oil.</p> <p>Waive duties associated with importing biodiesel.</p> <p>Provide incentives for local biodiesel production, especially using waste oils.</p>

Action Plan for Introducing New Clean Vehicles and Fuels Technologies in Hong Kong

Short-term Actions				
Action	What	When	Who Must Act	Ideas on How
Encourage heavy goods vehicle (HGV) fleets to use biodiesel and/or ULSD.	HGVs power requirements limit the use of alternative fuels other than diesel or biodiesel. Study applicability and implement switch.	ASAP	HKEPD, TD, HGV owners associations.	Continue and expand demonstration programme for HGVs with both biodiesel and ULSD.
	Work with Guangdong to encourage adoption of standards and fuels.			Prevent the use of high sulphur mainland diesel by law. Establish a petrol station at border selling ULSD or biodiesel that is cheaper than mainland diesel.
Encourage fleet operators to implement high quality diesel retrofit technologies.	Set comprehensive emissions standards for existing diesel vehicles.	ASAP	TD, HKEPD, fleet operators.	Continue to improve testing centres, operated or licensed by the HKSARG.
	Subsidise diesel retrofit technologies from several manufacturers.			Create incentives and subsidies for purchase of diesel retrofit technologies.
Apply clean petrol technologies to all vehicles.	Encourage use of ethanol additives for improvements	ASAP	TD, HKEPD, oil companies, biofuel promoters.	Test ethanol for ozone-producing potential.

Action Plan for Introducing New Clean Vehicles and Fuels Technologies in Hong Kong

Intermediate Actions				
Action	What	When	Who Must Act	Ideas on How
Encourage importation and market for alternative fuels.	Plan and develop alternative fuel/energy sources, and create distribution networks. Enter into long term contracts to procure reliable "clean" fuel sources.	Over next 2 years.	EDLB, Security Bureau, ETWB, HPLB, TD, HKEPD, oil and energy companies, vehicle manufacturers.	Conduct comprehensive study of cleaner fuels, especially electric, natural gas. Study current distribution networks and estimate cost of conversion and/or new distribution sources. Contract for supply and distribution of cleaner fuels.
Discourage private passenger cars.	Increase price of owning and operating private cars, which add to pollution and traffic congestion.	Over next 5 years.	ETWB, TD, Customs & Excise Department, IRD, HKEPD.	Raise taxes on private vehicles. Tie level of tax to level of vehicle emissions. Increase parking prices. Increase price of fuels, especially most polluting ones.

Action Plan for Introducing New Clean Vehicles and Fuels Technologies in Hong Kong

Long-term Actions				
Action	What	When	Who Must Act	Ideas on How
Plan for early introduction of fuel cell vehicles operating on hydrogen.	Plan for infrastructure that can support hydrogen fuel cell vehicles.	Planning starts today.	TD, Planning Department, HKEPD, Towngas, CLP.	<p>Establish energy policy including policy on common carrier system for natural gas.</p> <p>Plan natural gas carrier system for eventual conversion to hydrogen either by establishing conversion units at filling stations or as part of larger hydrogen energy distribution system.</p>

Action Plan for Clean Vehicles and Fuels Regulation and Planning

Action	What	When	Who Must Act	Ideas on How
Create new ministerial post for energy; revamp the Energy Advisory Committee; and ensure coordination between new minister and all parts of the HKSARG.	Plan for future energy needs and manage demand and supply on a large scale by establishing an energy policy and coordinating with other relevant government agencies to plan and build an infrastructure for introduction of alternative fuels and vehicles.	Appoint new minister on by July 2007.	Chief Executive to appoint new minister and ensure there is a clearly articulate energy policy by end-2007.	The new minister to coordinate all relevant bureaux and departments.
Relax specifications for alternative vehicles.	Allow fast track approvals ASAP for types of cleaner vehicle models. Waive the costs of applying for approval for zero emission vehicles, and reduce costs for low and ultra low emission vehicles.	ASAP	TD	TD to issue policy establishing preferences for cleaner vehicle models based on transparent performance criteria. Inform vehicle manufacturers throughout world and local distributors of the preference.
Broaden government specifications for public vehicles (buses, taxis, minibuses).	Allow more models and manufacturers to compete for public vehicle contracts. Discourage monopoly by a single supplier that can raise price for new vehicles (as occurred with LPG taxis).	ASAP	TD, taxi associations, PLB and minivan associations, franchised bus companies, vehicle dealers and manufacturers.	Learn what vehicles are available worldwide. Directly allow certain models or create specifications broad enough to accommodate more than one model and manufacturer.

Action Plan for Clean Vehicles and Fuels Regulation and Planning

Action	What	When	Who Must Act	Ideas on How
Set goals for large fleet operators to have a fixed percentage of cleaner vehicles.	Develop stringent legislation applying to government and private sectors that will force scrapping of polluting vehicles by a future date certain.	Now	ETWB, HKEPD, TD, LegCo, private fleet operators.	Draft legislation, set definitions of "large fleet" operator and consult those affected.
Develop comprehensive traffic management.	Design a comprehensive plan to reduce congestion, including ERP, dedicated pedestrian areas, utilizing IT to minimize trips and optimize routes.	Now and into the future.	ETWB, TD, HPLB, Planning Department, HKEPD.	Study options for traffic management. Release ERP study for public review and discussion of its adequacy. Adopt scheme and implement plan.
Ban or restrict idling engines.	Develop legislation to control, ASAP with provisions for stationary vehicles such as cement trucks.	ASAP	HKEPD, LegCo.	Draft legislation for consideration. Work with police to ensure enforcement. Encourage public to report violators.

Action Plan for Incentives for Cleaner Vehicles and Fuels

Action	What	When	Who Must Act	Ideas on How
Develop performance based incentives for cleaner vehicles.	Base incentives on emissions rather than fuel, age or type of vehicle.	ASAP	Various bureaux including ETWB, FSTB; and LegCo.	<p>Examine systems developed in other countries and methods of accurate emissions tests.</p> <p>Develop comprehensive regular testing programme for petrol and diesel vehicles.</p>
Encourage franchised bus operators to switch to cleaner buses.	Create incentives to expedite purchase of cleaner buses and use of cleaner fuels (Note: franchised buses currently pay no fuel duty)	ASAP	ETWB, HKEPD, FSTB, and LegCo.	<p>Set emissions standards that allow franchised bus operators to choose cleanest technology.</p> <p>Consider creating declaring Hong Kong a Low Emission Zone.</p>
Encourage switch to cleaner passenger vehicles, vans, lorries.	Allow waivers or reductions in the First Registration tax, annual license fees and fuel duties based on emissions levels of vehicles.	ASAP	ETWB, HKEPD, FSTB, and LegCo.	<p>Assess import costs of alternative vehicles and devise schedule of new taxes to make competitive with conventional vehicles.</p> <p>Impose additional pollution tax on new conventional vehicles that fail to meet performance standards.</p> <p>Set a comprehensive schedule of tax or duty concessions tied to vehicle emissions levels.</p>
Encourage the scrapping of old medium and heavy goods vehicles.	Subsidize the purchase of cleaner models of medium and heavy goods vehicles.	ASAP	ETWB, HKEPD, TD, FSTB, and LegCo.	Assess costs and devise schedule of new taxes, duties and subsidies.

Action Plan for Infrastructure and Research & Development for Cleaner Vehicles and Fuels

Action	What	When	Who Must Act	Ideas on How
Encourage vehicle producers to provide training and support to independent repair shops.	Require vehicle suppliers to provide copies of detailed maintenance manuals to independent repair shops.	ASAP	ETWB, TD, HKEPD, LegCo, vehicle suppliers/manufacturers.	<p>Draft legislation to compel vehicle suppliers to release maintenance information pertaining to emissions reduction as a precondition to operating in Hong Kong.</p> <p>Provide funding to support efforts to develop a comprehensive public database of maintenance manuals.</p>
HKSARG takes decision on common carrier system for Natural Gas (NG) supply.	Commit to a common carrier system for gas supply to forward the development of NG-powered alternative vehicles.	ASAP	ETWB, EMSD, HEC, CLP, Towngas, LegCo, vehicle manufacturers and dealers.	Release results of consultation and current status/policy. Take proposal to LegCo.
Identify and develop sites for NG distribution points.	Establish the necessary infrastructure for NG distribution.	ASAP	ETWB, EDLB, EMSD, HEC, CLP, Towngas, landfill operators, vehicle manufacturers, LegCo.	<p>Search for suitable sites for NG distribution.</p> <p>Encourage uptake of NG through possible waivers on land premiums or fuel duties.</p> <p>Consider switching government fleets to NG as demonstration vehicles and to create enough volume to warrant investment.</p>
Identify ways the utilities' supplies of NG, and landfill gas can be used in NG vehicles.	Lift Scheme of Control restrictions on use of NG for vehicles.	ASAP	EDLB, ETWB EMSD, HEC, CLP, Towngas, LegCo, landfill operators, vehicle manufacturers and dealers, transport operators.	Reach agreement between HKSARG and utilities to natural gas for vehicles.

Action Plan for Infrastructure and Research & Development for Cleaner Vehicles and Fuels

Action	What	When	Who Must Act	Ideas on How
Set up NG delivery system at suitable locations.	Plan for conversion to NG vehicles as intermediate stage.	1-10 years.	EDLB, HKEPD, ETWB, TD, EMSD, CLP, vehicle manufacturers and dealers, transport operators.	Undertake comprehensive study of likely refuelling stations for NG. Identify fleets most likely to convert.
Develop NG quality standards.	Establish standards for NG use in vehicles both in Hong Kong and the Mainland.	1-2 years.	EMSD, HKEPD, FSTB, CLP, HEC, Towngas, landfill operators, Guangdong authorities, LegCo.	Develop proposals and consult public. Propose and adopt standards following consultation.
Develop gas regulations and standards, especially safety.	Establish comprehensive standards exist for NG vehicles and distribution systems.	1-2 years.	EMSD, HKEPD, FSD, LegCo.	Propose and adopt standards and regulations following consultation.
Research and Development				
Create a research and testing centre for cleaner vehicles and fuels.	Create a research and testing centre for cleaner vehicles and fuels.	1-5 years.	ETWB, TD, HKEPD, EMSD, FSTB, Vocational training bodies, consultants.	Develop systematic testing facilities for the development of cleaner vehicles and fuels, including state of the art testing equipment and sufficient funding for comprehensive studies.
Study and develop recharging systems for electric vehicles.	Develop the infrastructure needed to encourage electric vehicles.	1-5 years.	Utilities, universities, Vocational training bodies, HPLB, TD, HKEPD, transport operators, large fleet operators.	Conduct study of potential uptake of battery electric vehicles and recharging/ infrastructure needs. Install recharging stations at strategic points.

Action Plan for Cleaner Vehicles and Fuels Education and Training

Action	What	When	Who Must Act	Ideas on How
Establish mechanic certification and/or refresher courses including training on emissions reduction.	Develop programme to qualify mechanics and to offer continuing professional development courses in alternative technologies and fuels.	Now and in future.	Existing HKSARG Working Group on Vehicle Maintenance Services, vocational training bodies, vehicle dealers and manufacturers, mechanic associations, shop owners, consumer protection groups.	Work with vehicle manufacturers, dealers and vocational training institutes to set standards and ensure adequacy. Create testing programmes for certification. Launch a public information campaign to raise consumer awareness of mechanic certification and to raise public profile of certified mechanics.
Educate the public on importance of "green" driving measures and vehicle maintenance to reduce emissions.	Educate and test new drivers and commercial drivers on "green" driving techniques. Develop outreach to existing drivers including public education advertisements.	ASAP	TD, driving schools, consumer groups, HK Automobile Association.	Make "green" driving part of driver's education programs and of driver's license renewal for commercial and private vehicle drivers. Launch a widespread publicity campaign that includes signage on buses and taxis, at petrol stations and along roads.
Launch a public information campaign on cleaner vehicles and fuels.	Promote public awareness of cleaner technologies and encourage public preference for them.	ASAP	HKSARG, HK Automobile Association, bus companies, oil companies and petrol stations, taxi companies, advertising agencies, vehicle distributors.	Put signage at petrol stations, on buses, taxis and along roads. Distribute information pamphlets at government offices and vehicle distributors.

Action Plan for Cleaner Vehicles and Fuels Education and Training

Action	What	When	Who Must Act	Ideas on How
Demonstrate the benefits of alternative vehicles and fuels.	Promote public awareness of cleaner vehicles and public acceptance of them.	Now and ongoing.	Government Land Transport Agency, vehicle dealers and manufacturers, alternative fuel promoters.	Switch government fleet to cleaner vehicles (except essential services) now available. Advertise the cleaner vehicle fleets; make them recognizable. Bring prototype cleaner vehicle like fuel cell buses to Hong Kong.
Use GPS and other new technologies to avoid traffic congestion.	Encourage private fleets (tour buses, hotel buses, etc.) to purchase GPS and utilize in trip planning	ASAP	Private sector, academic institutions, TD.	Develop incentives for purchase of GPS. Encourage adoption of other traffic control/planning technologies.
Establish a forum dedicated to group facilitation, mediation and consensus-building.	Facilitate discussion of policies and issues with all stakeholders in order to achieve consensus on policy or issue resolution.	Ongoing.	Non-profit NGOs, HK-SARG, facilitation and mediation experts.	Raise public and private funds to hire trained facilitators and mediators and establish a forum that would train mediators in both government agencies and private sector and that could act as a clearing-house for requests for mediation or facilitation from public or private sector.

Action Plan for Cleaner Vehicles and Fuels Education and Training

Action	What	When	Who Must Act	Ideas on How
Establish journalist training courses and briefing sessions.	Encourage journalists to cover “green issues” to promote public education.	Now and ongoing.	HKEPD, green groups, GIS.	Provide background education for journalists as part of newsworthy stories (demonstration fleet introduction, adoption of new policies, etc.). Encourage journalists to report on environmental problems associated with old vehicle technologies.

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