

Clean Air – Clear Choices

June 2007 | Invitation and Response Document



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1 Foreword

Over the past two decades, there has been growing international recognition that future development should be sustainable. Sustainable development must focus on the conservation of natural resources and eco-systems. To be socially sustainable, there must be equitable access to services for all citizens. These require profound changes at all levels of society, whether in governance, life styles, or civic commitment, as well as concerted action by all in defining and implementing sustainability objectives. The well-known Agenda 21, adopted at the United Nations Earth Summit in Rio in 1992, prescribes a participatory approach as desirable in ensuring socially responsible economic development that would also protect the environment for the benefit of future generations.

Since 2003, the Council for Sustainable Development has been a passionate advocate of sustainable growth. It has strived hard to put together a sustainable development strategy for Hong Kong. The Council has also become known for setting a standard of community involvement in the policy-making process. By offering the community opportunities to participate in discussions on how to make Hong Kong a better home for this and future generations, the Council's engagement process has provided a very valuable learning experience for all of us. During these efforts, we not only focused on environmental issues such as solid waste management, but also addressed concerns regarding urban living space, population growth and development. We are much encouraged by the community's response to these engagement exercises as well as increasing public awareness and understanding of the importance of such issues in enhancing the quality of our lives.

In the current round of public engagement, we will be focusing on an issue of major concern – air quality. It affects everyone and plays an important part in determining the quality of our living environment. While air quality in Hong Kong has become an emotive issue for many, we should not let these emotions mask the need for real and meaningful dialogues to identify the most viable choices for Hong Kong. The Council wishes to provide the necessary platform for these dialogues and consensus building to take place, based on which the Government will formulate the sustainable way forward for air quality issues afterwards.

I encourage you to read this Invitation and Response Document and the enclosed pamphlet in order to establish a common understanding of the issues at stake. I also urge you to take part in the series of engagement events that follow its launch. In addition, you can express your views by filling in the questionnaire attached to the pamphlet or through our dedicated website.

Let us all work together for the well-being of our future generations, which is built upon every effort you and I contribute to the sustainable development of our home city.

Rafael S.Y. HUI

Chairman, Council for Sustainable Development

2 Preface

Why do we need an engagement process?

- 2.1 Air is everywhere; we breathe it, and it receives an enormous amount of pollution, avoidable and unavoidable, which is directly the result of things that we do. The quality of air is a matter of intense public interest, not least because it touches everything that we do, and its abuse and degradation can severely restrict us and have damaging health effects.
- 2.2 Who are the custodians of the air in Hong Kong, in the Pearl River Delta region, and elsewhere? The **Government and the Legislature** are traditionally entrusted with this important duty. The public expects the Government to come up with innovative and forward-looking ideas that ensure the air is kept as clean as possible without damaging our health but at the same time not unduly shackling the economic growth that we all rely on to strive for a better future.
- 2.3 This is reasonable. But also **the public can and should provide the Government and the Legislature with the tools on which to base some of their ideas**. These will include the thoughts of the community and specific groups, or “stakeholders” – such as the transport sector, the power utilities, and the many business organisations. All of these may have sometimes conflicting and at other times complementary interests. How far they are willing to go, and what they are limited by in trying to realise the balance between aspirations and realities are key inputs of this process.
- 2.4 These points of view are important in the process of **Government policy making**, legislation drafting, and strategy enforcement – a long process, to be sure, but one that must be inclusive, accurate, well-informed, and that all sides can come away from feeling that there has been a meeting of collective minds and respect for differing viewpoints.
- 2.5 This dynamic process is an education of sorts, for the Government and politicians, for the community, for stakeholder groups: the Government learns how far the public feels it can cope with specific issues, technical, practical and at a more abstract level in the pursuit of cleaning our air and ensuring it stays that way; Hong Kong learns what **constraints** there are on the Government, it gains a sense of what the Government may need, as well as the thoughts and measures that it has already put in place, and its ideas to pursue. Importantly, politicians also get a sense of the public’s willingness to support certain policies for a healthy population as well as economic prosperity. The stakeholders explore the practical side of air-quality measures in the broader regard of clean air for all, leaving aside vested interests whilst understanding there are only choices and no absolutes.

The issue of air pollution and the implications for public health in Hong Kong are wide-ranging. The Council for Sustainable Development acknowledges this and has looked at Hong Kong’s air quality since the issue was raised at the Council’s stakeholder forum in 2005.

This Invitation and Response (IR) document is the result of the Council’s deliberations on Hong Kong’s air quality and is based on the Council’s previous report, *Clean Air and Blue Skies – the Choice is Ours*¹. This IR document is key to the stakeholder-engagement process that follows.

This IR document deliberately focuses on **local issues** and opens a discussion with you on **three key topics** (see Section 5, “Public Policy: Discussion Points”):

1. How can we manage the sources and behaviour that cause pollution on **days of high API readings** and what actions should we take when they impose unacceptable health risks;
2. How can we better use our roads and transport systems to reduce roadside air pollution through **road-pricing mechanisms**;
3. How can we change electricity consumption patterns that contribute to air pollution by adopting **demand side management** practices (which involve saving energy and using it efficiently)?

As stated above, the issue of air pollution is complex and dependent on cross-sectoral policies. Selecting these three topics is not to suggest that the Council is overlooking many other important areas and these topics are part of an overall strategy to tackle air pollution in Hong Kong. Indeed, the Council is maintaining a close dialogue with the Hong Kong Government and its report, *Clean Air and Blue Skies – the Choice is Ours*, strikes at the heart of several of the problems with clear recommendations for the Government to follow. In this regard, the Council has also invited the Government to respond to these recommendations by providing an update on policy initiatives in this document (see Section 4: “The Government: Challenges and Efforts”).

But, it is clear that we must first address the air-quality issues in our immediate vicinity that we can improve through changes in key policy areas. Hence, the Council has selected these three topics for **deeper public debate**, since the policy response could have widespread implications for how we live and, importantly, for our health. We must begin somewhere, and this is our starting point so that the views of stakeholders can be heard to provide decision-makers in the Legislature and the Government with appropriate feedback to shape policy.

The **Council for Sustainable Development** is an established, **open channel** and the public is also welcome to submit its views on the issues contained in the 2006 air quality report. These may be submitted through the Sustainable Development Unit of the HKSAR Government.²

¹ http://www.susdev.org.hk/en/report_list.htm

² The Council for Sustainable Development, c/o the Sustainable Development Unit, M/F, Murray Building, Garden Road, Central

What is the basis for this engagement process on air quality?

- 2.6 The Council's Report, *Clean Air and Blue Skies – the Choice is Ours*, (http://www.susdev.org.hk/en/report_list.htm) produced in 2006 covers both the broad scope of air pollution and specific and real issues pertaining to major stakeholders, the achievements in mitigating air pollution at the time of reporting, and suggests next steps that Government and industry might take to tackle Hong Kong's air problems. It was prepared after a forum organised by the Council in July 2005 at which stakeholders considered the air quality in Hong Kong to be one of the most imminent sustainability issues that needed to be addressed. The Council decided to take forward the priority area of **better air quality** as one of its coming engagement processes. A study group involving Council members and other local experts provided the report. During its preparation various inputs were sought from key stakeholders across the community and drew on a great deal of existing information.
- 2.7 In its 2006 report the Council stated there were **clear options** available to Hong Kong if it were to protect public health and see blue skies again. It set out a comprehensive set of suggested measures, both bold and incremental, together with guideline costings, on mitigation. It advised next steps regarding institutional issues, Government moves, the electricity generating sector, the transport sector, and the industrial sector. It made 14 recommendations for the Government to consider and implement speedily, acknowledging that Government was already working on them to varying degrees. The three topics that are the focus of this public engagement were among the recommendations that the Council believed the Government is not already involved in pursuing in terms of policy and where there is a need to engage the community owing to their territory-wide implications.

What is the purpose of this IR Document?

- 2.8 The role of this **Invitation and Response** (IR) document is to serve as the key platform to bring the three issues identified by the Council to the wider community for deliberation based on the Council's 2006 report. This involvement of stakeholders throughout the community is at the heart of this engagement process.
- 2.9 In keeping the public apprised of the progress on plans and action to improve air quality, the Council in its 2006 report made recommendations and requested the Government to respond.
- 2.10 The Government, for its part, has outlined its vision on air, on how it will continue to shape its policies and strategies on tackling specific emissions and sources of pollution, and how it plans further action at a dedicated website: www.susdev.org.hk/en/govtvision.htm.

- 2.11 In relation to the Council's 2006 report, it also outlines at the same website what it feels are the challenges in striking the right balance between providing the resources and environment for Hong Kong to drive for individual and collective prosperity, while taking care of the public's well-being.
- 2.12 As an indication that the Government has been listening to community concerns over the years, and acting on them, this website also contains a roster of Government measures on tackling air pollution. Institutional issues, measures taken in regard to the transport, industry and power-generating sectors speak specifically to the comprehensive recommendations presented to the Government in the Council's 2006 report.
- 2.13 Readers are invited to visit this website and respond to any of the issues therein by writing to the Council.
- 2.14 The Council identified in its 2006 report four areas that require further public consultation; three of these are the subject of this engagement process. The fourth area, banning idling vehicles, the Government is dealing with in a separate exercise. To facilitate the discussions, and to help guide stakeholders in the thinking and articulation of their views, the Council set up a Support Group in January 2007 to identify a range of key policy related questions around the three topics.
- 2.15 These are fully covered in Section 5, "**Public Policy: Discussion Points**". Briefly, they look at how to manage the sources and behaviour that cause pollution on **days of high air pollution** and the actions needed on days when conditions pose unacceptable health risks, and they study implementing two measures that change energy use behaviour, and therefore affect air quality – **demand side management**, and **road-pricing mechanisms** – and how these might be articulated for a range of stakeholders.
- 2.16 Each topic is presented with enough detail and discussion, case studies, and the context for Hong Kong to provide the basis for a meaningful consultation with a diverse range of community stakeholders. In this way, for high-air pollution days, for example, you will find the principles of air pollution alerts, a case study (Toronto), the context for Hong Kong, including discussion topics on how high-air-pollution days might be defined, the nature of alerts and alert systems, what may be the actions and responsibilities in the event of an alert, and a short list of critical, policy-level considerations for stakeholders.

How will the engagement process work?

- 2.17 The information gathered through the stakeholder views on the policy considerations outlined in Section 5 will help shape the **Council's recommendations** to the Government, and thereby future policies. This document plays a major advisory role to the Government and the Legislature on the next steps in improving Hong Kong's air for the long term and it brings in interested and informed parties from a wide range of sectors including business, community and the health sector. Even though it does not provide stakeholders a direct role in Government decision-making, it can inform the decision-making process that leads to policy.
- 2.18 The **discussion points** in Section 5, "Public Policy: Discussion Points", are critical in this process together with Section 3, "Aspirations and Realities", and Section 4, "The Government: Challenges and Efforts", as they inform the community and stakeholder discussion on related business and health issues, raising key, and sometimes tough, questions about air quality policy. These questions are to be used to prompt discussion during the various events, forums and other channels of this public engagement.
- 2.19 The details of this process, where and what you, members of the community, can do to take part are in **Section 6: "Getting Your Views on Record"**. It remains now for this important exchange to take place; to allow each stakeholder to learn from the other and, ultimately, for the meeting of needs, desires, vision and possibilities to work together for the health of our community, so we may all breathe easier.

3 Aspirations and Realities

INTRODUCTION

- 3.1 Hong Kong wakes to the prospect of air of different quality each morning. How "good" or "poor" the air is on any given day is influenced by a combination of natural and man-made elements and complicated by regional factors.
- 3.2 Pollution of the air results from everyday activities that meet the needs – many of them essential, such as electricity and transport – of the people of Hong Kong.
- 3.3 The balance of who or where contributes what to Hong Kong's skies can distract from the critical exercise of getting something done to improve the air. The meaningful progression of the debate on air quality is one of the principal missions of Hong Kong's Council for Sustainable Development. To this end, the Council in 2006 produced a report, *Clean Air and Blue Skies – the Choice is Ours*, in which, among other things, it recommended to the Hong Kong Government action on many areas its research found of most pressing concern with Hong Kong's air.

Hong Kong's Air Quality Problems

- 3.4 Air pollution is unlike other environmental issues. Whereas deliberate and direct action can be taken for others – recycling for waste, treatment for water, for example – air presents unique difficulties. **It is pervasive and has no respect for boundaries:** man-made ones are no exception. While no one would choose to drink contaminated water, there appears to be no choice when it comes to breathing polluted air.
- 3.5 The deterioration of Hong Kong's air has crept up over the years and now it demands urgent and appropriate action. Not only is it smearing the city's reputation overseas as a place to visit, work and enjoy, but most importantly it is affecting the health of the population. Studies by academics at the University of Hong Kong have provided research on the linkage between health costs and increased pollutant loads in the atmosphere, which underline the seriousness of the problem.



- 3.6 But what constitutes bad air? The measurement of concentrations of specific pollutants like sulphur dioxide (SO₂), nitrogen oxides (NO_x), respirable suspended particulates (RSP) and volatile organic compounds (VOC) informs the public on what the levels of pollution are in the atmosphere to which thresholds can be assigned. The thresholds in Hong Kong are covered by air quality objectives (AQO) which are similar to those used elsewhere, although some argue that because separate thresholds in other countries are higher, we have set air quality conditions that we consider acceptable but which would be rejected elsewhere.
- 3.7 Most pollutants in Hong Kong's air come from **burning fossil fuels** to produce electricity and to keep our transport moving. They come from stationary sources, like power plants, and mobile sources, like vehicles, ships and aircraft. Coal, oil and gas are the most common fuels used to generate electricity. For transport, Hong Kong most commonly uses oil-based fuels: petrol, diesel, and liquefied petroleum gas (LPG). Pollutants that come from their combustion and can be measured are SO₂, NO_x and RSP.
- 3.8 There are other, **non-fossil fuel-based pollutants** that have found their way to the skies over Hong Kong. Among the most significant are volatile organic compounds (VOC), because these are key elements in the formation of photochemical smog. These compounds evaporate as fugitive emissions when man-made substances such as solvents and chemicals are used in applications like paints, printing inks and household cleaners as well as when vehicles are being refuelled. The VOC remain suspended and latent until they react with NO_x under sunlight to form photochemical ozone, a precursor to smog.

The Regional Context

- 3.9 While Hong Kong pollutes the air through its own actions, pollution produced and blown in from the Pearl River Delta has made the damage worse. The influence of the **world's factory** on Hong Kong's environment is unavoidable. Directly controlling the damage in Hong Kong is made more complicated, especially with the range of pollutant sources. This is exacerbated by a physical climatic phenomenon that circulates and mixes pollutants generated both in Hong Kong and the PRD, making it difficult to distinguish between pollutants and their sources at any given place and any given time.
- 3.10 Yet, Hong Kong's own business interests in the PRD are substantial. They have been contributing to the pollution of the region's air, and this is making the improvement of Hong Kong's air more difficult. **Environmental costs** were not and have not been factored in with the economic benefits of relocating to lower operating costs and abundant, cheap labour over the boundary. Now a role for these

businesses emerges, and they can contribute to cleaning up the air by implementing cleaner production methods, energy efficiency and sourcing clean power for their operations.

Focus on the Issues and the Rationale

- 3.11 Whilst it is important to tackle the regional air quality issues, whether through Government channels or business practices, Hong Kong's first focus must be on **local problems**, starting by taking all the necessary precautionary measures and implementing the necessary policies.
- 3.12 Hong Kong must address air quality issues in Hong Kong first, since the emissions in our immediate vicinity are the ones that affect us directly, not least in our population's health as well as any related economic burdens, which can be quite significant in terms of health costs, reduced productivity and loss of investment opportunities.
- 3.13 Moreover, the insistence that the greater and initial responsibility lies elsewhere rests on **false logic**, as can be borne out by the dynamic nature of conditions from day to day. Similarly, arguments about which sector is more responsible than any other or which may be most affected by actions to rectify the situation are not to be tolerated, especially if this mires the discussion and results in no action.
- 3.14 Nevertheless, Hong Kong as a community must be seen by the world to have spared no effort to improve its air. We can take heart from the 1990 example when a restriction was introduced that required all power plants and road vehicles to use fuel oil with a sulphur content of not more than 0.5 per cent by weight. In the 12 months that followed, medical evidence showed that there was a substantial reduction in seasonal deaths particularly related to respiratory and cardiovascular causes. No one can actually predict with unfailing accuracy, if we take actions today, whether we will have the same benefits over the coming several years – but it would be difficult to argue that they will fail to bring any benefit at all.
- 3.15 Even if conditions do not improve dramatically, we must ask how much worse might they be through failure to be decisive now? The damage to Hong Kong and its citizens is now significant and it is **best to address it now** to avoid the escalating costs when trying to fix the problems in the future. To achieve meaningful health benefits, the actual "population at risk" constitutes not just the sick, frail, elderly and susceptible young (e.g. asthma cases) but members of the entire population who may suffer long-term effects if exposed to constant and persistently high levels of air pollution.

- 3.16 Thus, first focus must be on local issues, what can be controlled: there can be little doubt of the benefits for pedestrians that will come with cleaner-operating vehicles, or for the atmosphere in general, should the generation of electricity or our efforts to become more energy efficient result in fewer and less-damaging emissions.

The Council's Report

- 3.17 The Council's work on improving Hong Kong's air has been ongoing since 2005, when it held its first forum on this most important and pressing area of concern in July. The forum, at which stakeholders considered the air quality in Hong Kong one of the most imminent sustainability issues to address, yielded the Council's report of 2006, *Clean Air and Blue Skies – the Choice is Ours* – covering the issues both broad and specific, measures being taken and planned, and recommendations to the Government – and the decision to push forward with this current engagement process as a priority.
- 3.18 Areas such as marine emissions are not part of this current engagement process. These are the subject of previous and ongoing discussions, some involving commercially sensitive negotiations that are in progress, and some political, regional and international negotiations. For example, marine emissions will require agreement between the Mainland, Hong Kong and other ports in the region to begin the dialogue on a coastal emissions regime. The maritime industry is working on this problem on a global scale and the Hong Kong Government is closely monitoring overseas development and is prepared to introduce relevant marine emission-control measures where and when applicable.
- 3.19 The Government has provided a limited response to the Council's 2006 Report, its advice and recommendations in the next section. It gives specific details at the dedicated website, www.susdev.org.hk/en/govtvision.htm.

4 The Government: Challenges and Efforts

As an integral part of the engagement process on air quality, the Council for Sustainable Development submitted its 2006 report, *Clean Air and Blue Skies – the Choice is Ours*, to the Government, emphasising the importance of a response to the recommendations contained therein so as to keep the community abreast of developments.

The Government has replied below and in more detail at a website developed especially for this public engagement. It can be found at: www.susdev.org.hk/en/govtvision.htm.

More than Just Air

- 4.1 The Government has worked on improving air quality consistently over many years, and with increased intensity since the 1990s when the restriction on sulphur content in fuel oil was introduced resulting in significant health benefits.
- 4.2 It has been necessary for the Government's approach to be broad and international as well as attend to specific local issues; to consider the relationship of air quality with other issues, environmental and non-environmental. This ranges from considering air pollution and the improvement of air quality in the region, in particular the PRD region, to measuring specific pollutants generated and understanding how best to mitigate these emissions.
- 4.3 The Government follows and assesses overseas trends and considers the concerns and standards of internationally renowned bodies such as the World Health Organisation (WHO) and the US Environmental Protection Agency, and their appropriate application in Hong Kong. The Government also closely examines the various air pollutants in Hong Kong and their impact on local life.
- 4.4 On local issues, the Government has introduced major initiatives that aim to lower the levels of roadside emissions and require the use of cleaner fuel in the generation of power. It is also working on each of the 14 recommendations made by the Council for Sustainable Development in its report, *Clean Air and Blue Skies – the Choice is Ours*; a detailed response is at the website, www.susdev.org.hk/en/govtvision.htm.
- 4.5 Of course, the Government is committed to doing more for air quality, with its knock-on effects on health, the economy, the environment and quality of life. These are also vital indicators in making decisions to develop Hong Kong into the kind of place that we all want to live and work in – and of which we can all be proud, which is the direction in which the Government's policies are meant to take us.
- 4.6 At present, there are initiatives that the Government is working on in co-operation with local, regional, and international bodies that are the way forward.



Balancing Air Quality with Growth

- 4.7 Government must ensure that policies specific to air are in harmony with overall policy objectives, direction, and tone and that the appropriate institutions are in place. This is one of the challenges that face all of us. It is a challenge that the Government must be willing to take up, and in doing so, the Government must work in co-operation with the people of Hong Kong.
- 4.8 With concern about the air running high, the Government believes it is important to inform the community it serves of how it has been – and is – working to relieve these concerns.
- 4.9 The spirit of the Government’s commitment to clean air – and a clean environment – while still providing the right conditions for business and the community at large to prosper is strongly reflected in policies already in effect and under study.
- 4.10 In particular, a number of health and related benefits of improving air quality identified by the Department of Health include:

Direct Benefits

- Lower incidence of acute and chronic illnesses related to air pollution, such as asthma attacks, chronic and acute bronchitis etc.
- Reduced health care costs as a result of decreasing:
 - Number of emergency room visits
 - Primary health care required (e.g. care for asthma cases)
 - Number of hospitalisation cases
- Reduced out-of-pocket costs from patients requiring medical treatment.

Indirect Benefits

- Improved economic productivity due to better health and prolonged life expectancy.
 - Decreased sickness absence or work day loss and reduced time for medical care.
 - Reduced expenses for avoiding adverse effects of air pollution (e.g. moving home or job).
- 4.11 The public engagement on Better Air Quality is an important source in our decision-making and policy formation process, and will be used to map out our strategy on air quality management that will set robust targets for the short and the long term. In particular, the three key issues that had not been discussed thoroughly within the community before, but would make a difference in air quality, are the subject of discussion of this process.
- 4.12 There are some who question the robustness of the Government’s selection of Air Quality Objectives (AQO). It is the policy of the Government to continually review the AQO, calibrated against the most up-to-date information, and apply the understanding gained from such research to four vital fields to ensure the best air possible for Hong Kong: **institutional improvements; and engaging the power, transport, and industry sectors.**
- 4.13 A study to be commissioned by the Government in 2007 will review Hong Kong AQOs by taking into account the new guidelines of the WHO and the latest studies in Europe and the United States. A major objective of the study is to develop a long term air quality strategy for Hong Kong.

Institutional Issues

- 4.14 Institutionally, the Government will invest in building on and strengthening already proven official bodies to continue the proven guardianship of Hong Kong’s and the immediate region’s air:
- With effect from 1 July 2007, closely related policies on environmental protection, sustainable development and energy will be put under the same bureau (i.e. the Environment Bureau). The new Environment Bureau will oversee, among other things, the development of air pollution control policies and their enforcement.
 - The Air Pollution Control Ordinance, the cornerstone of Government policy on air, is to be amended to project beyond 2010 emissions reduction targets. Crucially, the ordinance acts in the best interests of protecting public health and also translates into vital considerations for environmental conservation.

- International and cross-boundary co-operation will continue to play a vital role in the continuing mission that recognises air pollution and its effects as pervasive: this will be embodied in work through the Joint Working Group on Sustainable Development and Environmental Protection, the Pan-Pearl River Delta Regional Environmental Co-operation, and the Co-operation Arrangement between Mainland and HKSAR on Tackling Air Pollution, as well as related international treaties and conventions.

Power Sector

4.15 It is the Government's policy to effect improvements in emissions by tying financial returns to the power companies' environmental and emissions performance. The current approach is to lower air emission caps progressively through legislation and the companies' licensing terms. The Government acknowledges the rise in SO₂ emissions and a general fall in other key air pollutant emissions, but still understands that more needs to be done. It intends these approaches:

- To link the permitted rate of return for the power companies to the achievement of emission caps in their licences for the post-2008 electricity market.
- Through fossil-fuel quality control and use in power generation:
 - By prescribing the maximum sulphur content in coal (1 per cent for now); requiring power companies to adopt best practicable pollution controls (such as maximising the use of natural gas and installing emissions-reduction devices).
 - By banning the construction of new coal-fired generating units: recognising a future of cleaner power generation and thus emissions.
- Embarking with Guangdong on an "Emissions Trading Pilot Scheme for Thermal Power Plants" in the Pearl River Delta Region, the region's first. Its aim is to add emissions trading to power plants' means to cut emissions cost-effectively.

4.16 The Government is committed to the development of renewable energy in Hong Kong with a view to improving our air quality and reducing our greenhouse gas emission. In the First Sustainable Development Strategy for Hong Kong promulgated by the Government in May 2005, after considering the local social, economic and environmental conditions, the target of having 1-2 per cent of Hong Kong's total electricity supply met by renewable energy by 2012 was set. The Government has proposed in the Stage II Consultation Paper on Future Development of the Electricity Market in Hong Kong that arrangements would be made in the future regulatory regime to promote the development of renewable energy (such as providing financial incentives to the power companies in the form of a relatively higher rate of return for renewable energy infrastructure).

- 4.17 As a major strand of its energy initiatives, the Government continues to mobilise the public to take personal action to achieve energy efficiency.
- 4.18 The Government also takes the lead by setting internal targets to reduce power consumption by **6 percent between 2003 and 2007**. To date, the Government's electricity consumption is down 5.6 per cent. It intends a **further 1.5 per cent reduction from January 2006**, as stated in the 2005/06 Policy Address.
- 4.19 The Government has implemented a range of demand-side management initiatives, from voluntary energy efficiency labeling schemes, building energy codes to a pilot scheme on the wider use of water-cooled air-conditioning system.

Transport

4.20 With an eye on cleaner and more energy efficient passenger transport, the Government's policy is to afford priority to railways. It will continue to pursue the planning of railway projects. It will promote rail as Hong Kong's passenger transport backbone to be supplemented with feeder services using other public transport modes. Integrating transport and land-use planning, such as locating intensive developments and employment centres within walking distance of rail stations, will help maximise rail use, reduce reliance on road-based transport, and lessen the impact on environment.



4.21 Further, providing well-coordinated and quality public transport interchanges at railway stations will help feed passengers to the railways and maximise the efficiency of the transport system as a whole. To this end, three railway projects are under construction: the Sheung Shui to Lok Ma Chau Spur Line; the Kowloon Southern Link; and the Tseung Kwan O South Station.

4.22 The Government's policy is to control vehicle emissions by continuing to ban low-grade, high-polluting fuels and promote clean engine technology. It requires motor vehicle fuels on the

local market to comply with the most stringent practicable standards. Leaded petrol is banned, and the latest statutory standards for petrol and diesel in Hong Kong are both Euro IV, in line with the EU, and will continue to be tightened.

5 Public Policy: Discussion Points

- 4.23 The Government has also cut 30 per cent from the first registration tax, subject to a \$50,000 cap per vehicle, to encourage the use of environment-friendly cars (including hybrids) with low emissions and high-efficiency engines. To encourage the use of clean, electric vehicles, the Government has extended the first registration tax exemption to 31 March 2009.

Industry

- 4.24 The Government's policy is to pursue pollution control through both voluntary and mandatory measures:
- It firmly believes that the whole community should combat air pollution. Every small step taken by each individual helps.
 - It has mandated limits on VOC contents in paints, printing inks and consumer goods. Manufacturers and importers must, since 1 April 2007, strictly abide by these new phase-in standards, which are among the world's most stringent. Consumers are also urged to reduce the use of VOC-containing products and replace them with less-polluting substitutes.
- 4.25 Cross-boundary co-operation will continue to play a vital role in industrial environmental protection issues. These include technical development and exchanges.
- Hong Kong and Guangdong have since 2003 developed a regional air-quality-monitoring network.
 - Aggressive air pollution targets were agreed in 2002 to reduce regional emissions of four air pollutants by **20-55 per cent using by 2010**, using 1997 as the base year.
- 4.26 On company behaviour, the Government will continue to promote higher environmental performance for Hong Kong companies operating in the Mainland. All such companies, whether based locally or in Hong Kong, would need to comply with the local environmental legislation, which are expected to be tightened further over time.



5.1 High Air Pollution Days

Introduction

- 5.1.1 As urban centres develop, it is common to find that ambient air quality deteriorates due to man-made activities that include the burning of fossil fuels for transport and electricity generation and uses of chemicals that emit chemical-based and solvent vapours (VOC).
- 5.1.2 main types of air pollutants encountered are:
- Sulphur dioxide (SO₂)
 - Nitrogen oxides (NO_x)
 - Carbon monoxide (CO)
 - Particulate matter
 - Volatile organic compounds (VOC)
 - Ozone
- 5.1.3 Concentration levels of air pollutants are often used to denote whether the air quality being measured should be classified as "good" or "bad". An indicator number is assigned and compared with recognised international standards (usually based on detected impacts to health) to ascertain whether the air quality level is acceptable or unacceptable to the general public.

Principles of Air Pollution Alerts

- 5.1.4 In most cases, rather than looking at just one specific pollutant, measurements for a range of pollutants are taken from which a single value can be derived. This is the basis for the setting of an "air pollution index".
- 5.1.5 In some countries, on the other hand, it has been found that the concentration of one outstanding pollutant, for instance ground-level ozone, can be used as the sole indicator because this is a distinguishable contributor to health damage.
- 5.1.6 Communities therefore can either take a generic index or a single-pollutant index as a measure of how severe the air pollution is for a particular day or a specific location. Specific index values can be set as alerts, which may forecast an approaching day of high pollution. These "high air pollution alerts", or HAP day alerts, trigger action that may be "passive", such as an alert to the general public, or "active", which may be a Government-imposed order to reduce pollution-creating activities, or voluntary action by businesses, like stopping transport or having employees work from home.



5.1.7 In general, communities react passively; Hong Kong gives a daily sounding of API readings. Much of the purpose of this is educational, making members of

the public aware of local levels of air pollution. These soundings come with guidelines on what the public can do both to protect itself, particularly vulnerable groups such as children, the elderly and individuals with respiratory ailments, and advice on certain outdoor activities. The intention is that **positive habits** that develop to cope with HAP days – reducing the use of vehicles and switching off of unnecessary electrical equipment are two examples – will become daily habits and second nature.

5.1.8 Visibility – or more accurately the lack of visibility – is also used some times as an indicator of air quality. Low visibility can be attributed to certain pollutants, such as particulates and NO_x, meteorological conditions, such as water vapour in the atmosphere, or a combination of these.

5.1.9 Reduced-visibility phenomena caused by high levels of air pollution are called haze or more commonly **smog**. Direct scientific measurements of smog are difficult. Concentrations are impossible to quantify since smog is actually a mixture of several different pollutants. Instead, ozone, one of the main components of smog, has been used as an indicator in some countries; in Hong Kong lack of visibility can be taken as a measure of smog intensity when the moisture content is not high.



Case Study

Toronto

5.1.10 Like many urban centres in North America, Toronto occasionally experiences poor air quality episodes during the summer months. By nature of its geographic location, Toronto is exposed to air pollution being blown in over the Great Lakes from industrial locations, notably those in the US.

5.1.11 The State of Ontario, of which Toronto is a part, operates a statewide air-monitoring network comprising 38 stations across the state. When this system detects that there is a 50 per cent chance that a smog day is coming within the next three days, the Ontario Ministry of the Environment issues a “smog watch”. When a smog alert is expected within the next 24 hours, the ministry issues a “**smog advisory**”.

5.1.12 In 1998, the Toronto City Council adopted a Corporate Smog Alert Response Plan that calls for “smog alert³” days to be announced during periods of likely poor air quality. The aim of the plan is to reduce air pollution by modifying municipal activities and to minimise the health impact of smog by encouraging the public to take appropriate precautions. On a high-smog day, people are also advised to consider ways to adjust their activities for the day. They may car-pool, use mass transit rail, and work from home. They are advised to avoid strenuous outdoor physical activities, and to protect those most affected by bad air, children, the elderly and asthmatics. Those with breathing and heart problems are requested to pay special attention to increased symptoms.

5.1.13 Toronto’s plan further outlines special actions that Government departments will take on smog alert days. These include reducing the use of non-essential gasoline and diesel-powered vehicles, oil-based paints, solvents and cleaners as well as postponing the use of gasoline-powered equipment and delaying the refuelling of vehicles until nightfall. Government staff in general are advised to take public transit or walk to work, and to wear casual clothes. Some non-essential services are temporarily reduced or suspended during, provided that public health and safety are not jeopardised. However, no emergency or essential services are altered. In addition to prescribing the activities for Government departments on smog alert days, the plan has been developed to look at long-term measures, like: programmes to reduce employee trips; the development of “green” Government transport fleets; modifying municipal gasoline equipment; and introducing legislation to encourage use of natural-gas vehicles.

5.1.14 The Toronto City Council is continually reviewing its alert system and there has been a proposal since 2000 to add particulate matter, PM_{2.5}, to this list of measured pollutants.

5.1.15 It is worth noting that many of the actions recommended by Toronto and other cities for HAP days, such as conserving energy, taking public transport, reducing the use of VOC-containing products, and keeping vehicles in good repair, are year-round environmentally friendly practices, not just for high-pollution days.

³NOTE : the “smog advisory” issued by the Ontario Ministry of the Environment is the equivalent to the City of Toronto’s “smog alert”

Context for Hong Kong

5.1.16 Like many other cities, Hong Kong's API serves to advise the public to take "passive" precautions in high pollution. To adopt a more active HAP-day alert, we must consider certain factors:

Definitions

5.1.17 The definition of HAP days – do we use the current Air Pollution Index benchmark, which covers several pollutants, or should this be adjusted to one **traceable pollutant**, or can visibility be used? Visibility, however, may not be related to specific forms of air pollution that could be prevalent even on clear air days. Conversely, lack of visibility could also be due only to water vapour in the air.

5.1.18 The definition of safe levels – for instance, the use of typhoon signals is very simple and easily understood. During such times insurers will refuse to insure people doing activities that go against Government warnings. How do we find an equivalent system for air quality?

Systems and Alerts

5.1.19 The alert has to have a **predictive element** so that the public is preferably told in advance of – not after – the onset of high levels of air pollution. How far in advance is it possible to alert the public? There are technical limitations in being able to forecast, for instance, plumes of air pollution which form very quickly. We should consider what needs to be done should there be a false alert.

5.1.20 The existing API may be used to complement an alert system – how best might it be? We could consider a simple system to denote pollution-alert days best, such as a **colour-coding scheme**, where green means the air quality is "good", amber means "some action must be taken", and red denotes "urgent action must be taken".

5.1.21 There could be different alerts for different types of impending pollution – is it worth considering one for haze or visibility, and another for measured air pollution levels?

5.1.22 It is important to ensure that the public appreciates the **urgency** in taking action on HAP days. It overcomes the sense of helplessness among members of the public when high API readings are announced, that they have no option but to carry on with normal daily activities. What are the specific measures that we should take during HAP days? Should these measures be taken only on HAP days or also on normal days?

Actions and Responsibilities

5.1.23 Toronto advises **changes in behaviour** on smog-alert days – we may consider making similar modifications, in particular with transport, by either walking instead of using vehicles, using public transport, turning off idling engines, reducing air-conditioning and electricity consumption, or even avoiding the need to travel by working from home (i.e. telecommuting), although the practical issue of how certain professions that have to work outdoors e.g. construction workers and police would have to be considered.

5.1.24 Modifications in transport activities may further be tied to road pricing to discourage the use of private vehicles.

5.1.25 There is also scope to think about modifying our power and energy consumption activities. Examples include adjusting air-conditioner settings, wearing casual clothes and switching off unnecessary electrical and diesel-powered equipment.

5.1.26 The effect of HAP days on **businesses** – these tend to be insidious (like long-term health impacts on employees or inability to attract overseas staff to Hong Kong), rather than short term and direct.

5.1.27 How to engage businesses – some businesses have signed up to the voluntary Clean Air Charter, but are unclear on what actions they should take and could possibly do when there is an alert. Be that as it may, many thousands more have yet to sign up.

5.1.28 Major corporations play an **important role** in the community and are the focus of many people's daily lives. What, then, should major corporations do on HAP-alert days? Companies could consider whether they have a moral obligation to protect employees who are particularly susceptible to air pollution, maybe allowing them to work from home instead of having to travel to and from work.

5.1.29 Use of the media to **communicate** clear and informed messages to the public.

5.1.30 Another sector critical to an important group in our community is the education sector. What responsibilities lie with the education sector on HAP-alert days?

5.1.31 These responsibilities may extend to sending out educational messages about HAP-alert days and the harmful effects of air pollution to human health to schools and tertiary institutions.

5.1.32 There may be other ways, perhaps more suitable, to warn the young against over-exposure to air pollution on HAP-alert days.

5.1.33 The same may be considered for people with **medical needs** – what should they do on HAP-alert days?

5.1.34 We should also ensure that vulnerable groups, such as those with respiratory illnesses and the elderly, are adequately protected.

5.1.35 What individual responsibilities should we take? Examples include turning off unnecessary electrical equipment and minimising the use of household chemicals (to avoid emission of solvent vapours).

Questions for Stakeholders

5.1.36 To discuss this subject, stakeholders are invited to consider the following questions:

- What would be the best system to use to alert Hong Kong when air pollution is severe enough to affect health?
- What policies should we consider concerning outdoor events organised on high air pollution alert days?
- How far should the Government go in imposing mandatory responses to high air pollution alerts?
- What would be the best way to use the alert system to educate the public about the need to change its behaviour and contribute to reducing pollution?

5.2 Road Pricing

Introduction

5.2.1 Hong Kong's integrated network of roads and rail gives it some of the finest land public transport systems in the world. Each day, we rely on taxis, mass transit rail, public buses and trams to carry people to and from work and on their daily business. Private vehicles provide further options for passengers and freight. These highly **efficient systems** ensure that we have a wide range and a high frequency of choices available for us. Transport in Hong Kong is further favoured by the short distances and the convenience of being able to alight or embark next to or near chosen points of travel.

5.2.2 To maintain this advantage, we must manage our road systems effectively and ensure that traffic flows are as smooth and free of congestion as possible. Should we achieve this, a key benefit that will arise – apart from the time saved from having to wait in traffic – is the improved **air quality at roadside**. Roadside air pollution created by vehicles and other sources is made worse by flanking high-rise buildings that create the so-called “corridor effect” and hinder the dispersal of air pollutants, causing the high API readings in areas like Mongkok, Central and Causeway Bay.

5.2.3 Restricting vehicles from entering and causing congestion in these areas will ease this problem. **Road pricing** is one option for Hong Kong to consider in managing traffic flow, and this can be a valuable factor in planning for our future transport needs. Many cities are beginning to adopt these. New York, for instance, announced a plan in April 2007 to introduce a form of road pricing.

5.2.4 At the same time, there is heated debate in Hong Kong about the pressure on land and the need for harbour reclamation to build more roads and highways.



Principles of Road Pricing

5.2.5 Road pricing is defined as an **economic tool** used to charge motorists for using roads. In most cases, this is in the form of a toll paid at a booth to give access to a stretch of road or a thoroughfare such as a bridge or a tunnel. The money accrued from this exercise is used to pay for the upkeep and administration of the road or thoroughfare, with a little extra retained. The recipients of this revenue can be either governments or private companies (working through partnership with the former). The cross-harbour tunnel charges are a current example of road pricing in Hong Kong.

5.2.6 Road pricing is also recognised as a means of reducing **traffic congestion**. Based on a user-pays principle, it works by setting a price for the use of the road in a designated area. Motorists can then choose if it makes economic sense for them to pay a charge to bring their vehicles into the restricted area as part of the cost of doing business or leisure. If the price is set at an appropriate level, many motorists would choose not to bring their vehicles in, thus reducing congestion. In general, road pricing is an alternative method of restricting traffic without having to resort to imposing outright traffic bans.

5.2.7 The considerations for implementing road pricing therefore must include:

- The level of pricing;
- A way to record and charge users should they still wish to use their vehicles;
- Penalties if motorists do not follow the rules;
- Alternative methods of transport (e.g. public transport); and
- Alternative routes.

5.2.8 The last point is pertinent, especially in Hong Kong's case: road pricing is not necessarily meant to just reduce but also to redistribute overall traffic and, in the long term, reduce the demand for the construction of more roads and highways.

5.2.9 However, in regard to improving air quality, easing traffic congestion will undoubtedly decrease the emission of vehicle-related air pollutants in the designated areas, with possible health benefits for workers and inhabitants. In general, should motorists revert to other means of cleaner transport, like mass transit rail, electric trams, bicycles, or even choose to walk, the quality of the environment should improve around the restricted roads. It can further be seen that employing road pricing as part of an **integrated transport policy** will promote the development of other forms of public transport – rail and buses – and advise people to consider other environmentally-friendly modes of transport, like park-and-ride and walking.

5.2.10 Road pricing can also be used to differentiate between environmentally superior vehicles, like those that run on Euro IV engines or hybrid vehicles, encouraging motorists to buy and use them.

5.2.11 We look at two case studies of road pricing, in Singapore and London.

Singapore

5.2.12 Singapore has used road pricing since 1975. Its initial manual systems were replaced in 1998 with an electronic road pricing (ERP) system covering the city's main commercial area, the Central Business District (which was known as the "restricted zone"), and the island's expressways. The ERP is operated by the Land Transport Authority (LTA) and is based on a short-range detection mechanism. Vehicles fitted with a stored-value card are registered as they pass short-range radio detectors mounted on fixed gantry points leading into the restricted zone. Depending on the time and location, an amount is deducted, varying from S\$0.25 to S\$3.00. No toll is charged during off-peak hours.

5.2.13 Since implementing the ERP the LTA has found **road traffic has decreased** with fewer vehicles within the restricted zone while the system is in operation. More car-

pooling, increases of traffic-flow speeds in the restricted zone and easing of peak vehicular traffic into non-peak periods further indicate a more efficient usage of roads. Despite a growth in traffic volumes over the years, the average speeds on expressways and major roads have remained unchanged.

London

5.2.14 The London congestion charge is a fee placed on motorists driving within the Central London area. This zone is within the London Inner Ring Road and includes the City of London and the West End, the financial district and the commercial and entertainment district. The congestion charging system was established in 2003 and is operated by Transport for London (TfL), a functional body of the Greater London Authority set up to implement the Mayor of London's Transport Strategy. London's system differs from conventional road pricing systems in that it is based on an **Automatic Number Plate Recognition** scheme that randomly detects vehicles entering and leaving the zone through a network of 230 CCTV cameras located at different points on the zone boundary. Although the system is random, the TfL reports that most vehicles are recorded.

5.2.15 The charging system operates between 7am and 6.30pm, Mondays to Fridays. Motorists pay to enter the zone beforehand, linking the charge to a vehicle licence-plate number. This number can be captured by CCTV cameras; fines are issued within 48 hours to motorists whose number does not tally with a paid fee. The charge for entering the restricted area is £8; the fine for those found to have entered without paying averages £100. Roughly 100,000 fines are issued each month. Business fleets can be registered with TfL; each vehicle is charged £7 if detected by cameras.

5.2.16 The scheme is not revenue neutral: it aims to generate income for TfL to cover the operating costs of the system and other services too. Buses, taxis, emergency service vehicles, motorcycles, bicycles and alternative-fuel vehicles are exempted.

Context for Hong Kong

5.2.17 Hong Kong has some features that any road-pricing scheme must take into account. These include:

Areas of Application

5.2.18 We have well-defined congested areas such as Central, Causeway Bay, Wanchai, Mongkok, and Tsim Sha Tsui. To which congested areas would road pricing best be applied? What is the most appropriate **charging structure** – should it be based on time of day, with exempt periods (like night to divert goods deliveries from busy daytime periods), or road usage, or areas entered?

- 5.2.19 Hong Kong has a high number of franchised buses, public light buses and taxis, all with competing fare structures, all of which use roads within well-defined congested areas: should these be charged, as well as private vehicles?
- 5.2.20 Many shop networks operate within congested areas and rely on efficient supply chains based on **timely commercial deliveries**: how are these deliveries to be accommodated in any road-pricing scheme?
- 5.2.21 There are bound to be passengers with specific needs entering designated zones, such as patients visiting doctors' clinics, but also emergency services vehicles. What exemptions should be considered for designated areas?

Variable Pricing

- 5.2.22 This is related to the considerations of whom to charge and what fee structures are applicable. Can variable pricing be used to encourage more drivers to install filtering exhaust systems or to buy environmentally friendly vehicles with Euro IV engines or better whilst **penalising** drivers of older, polluting models?

Actions and Responsibilities: Transport Alternatives

- 5.2.23 Alternative routes redistribute traffic from designated zones. How important to a successful road-pricing strategy are **alternative routes**, and where might Hong Kong need to improve its infrastructure so that road pricing can be implemented?
- 5.2.24 Must free by-passes be built for road pricing to be adopted?
- 5.2.25 Hong Kong also has good interchange facilities to switch from private to public transport (park-and-ride) that can be better used. It has an **efficient mass transit rail system** increasingly covering more areas.
- 5.2.26 Hong Kong also has rich experience in how forms of passenger walkways, like the Mid-Levels Escalator, have not only eased the passenger burden on transport systems but also given rise to flourishing commercial activities due to increased pedestrian traffic, as has the **pedestrianisation** of parts of congested Hong Kong like Causeway Bay.

Promoting Road Pricing

- 5.2.27 Retailers have found the greater flow of pedestrians in areas where traffic has been restricted has given rise to more business opportunities. Can the benefits of such situations be used to advantage in encouraging road pricing? What incentives and benefits would encourage the acceptance of road pricing?
- 5.2.28 However, does road pricing raise issues of **privacy**, and if so how should those involving surveillance be reconciled?

- 5.2.29 Lastly, road pricing has been shown conclusively in other countries to reduce traffic. However has air quality actually improved? Studies in London have shown a decrease in NOx and particulates in the charging zones associated with the increases in vehicle speeds, which is as important as the change in vehicle numbers.

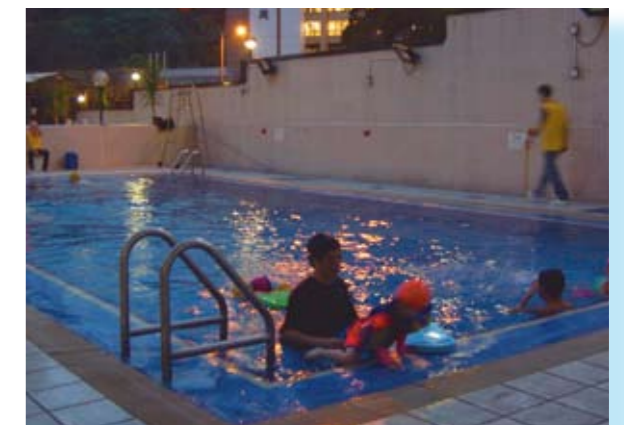
Questions for Stakeholders

- 5.2.30 In discussing this subject stakeholders are invited to consider the following questions:
- Should we use road pricing to reduce roadside air pollution as part of an overall policy to reduce transport-related air pollution?
 - How should the road pricing fee policies be designed based on the characteristics and polluting behaviour of the vehicle and the time and place of use in order to be most effective in terms of reducing roadside air pollution?
 - How can we link road pricing to policies that encourage less polluting means of transport like hybrid vehicles or avoid pollution generation altogether through walking or cycling?

5.3 Demand Side Management

Introduction

- 5.3.1 Hong Kong enjoys a **safe and reliable** electricity supply that has been in operation for many years. This power supply has helped transform Hong Kong's economy into the modern success it is today.
- 5.3.2 However, since electricity generation is dominated by the burning of fossil fuels and the resultant emission of various air pollutants, we must find ways of managing our energy and consumption. Careful and use of electricity will ensure that we have supplies to service future needs as well as current ones – and importantly, we will end up saving money through reduced electricity bills.
- 5.3.3 Managing the supply and demand of electricity is a critical factor in reducing the environmental impacts by reducing unnecessary consumption of fossil fuels, and thus avoiding generating air pollutants.
- 5.3.4 **Demand side management (DSM)** is a widely used method of managing electricity consumption. It is a means of encouraging energy efficiency and promoting energy savings.



Principles of Demand Side Management

- 5.3.5 DSM is broadly defined as the implementation of measures to influence the timing or level of consumers' electricity demand to optimise the use of power generation facilities. DSM can be accomplished by either reducing peak electricity demand, or by reducing users' energy consumption.
- 5.3.6 Shifting electricity demand from peak to off-peak periods allows more efficient use of load and significant savings by avoiding the need to build new power stations and related transmission lines. In Hong Kong, CLP Power Hong Kong Ltd (CLP Power) offers cheaper off-peak electricity in its supply region. Although Hong Kong has only a few industrial consumers, who generally have greater flexibility in adjusting their operations to take advantage of cheaper off-peak electricity, there should be scope for further shifting electricity demand to off-peak periods. This may be pursued through introducing **peak-load pricing** for commercial consumers and looking at peak demands over the course of a year to carry out the necessary energy planning.
- 5.3.7 However, the real and direct benefits arise when users implement DSM through reducing their energy needs either by **energy efficiency** or through **energy conservation**. Properly executed, DSM energy efficiency and conservation schemes can provide incentives for electricity utilities and consumers to form partnerships that will reduce the overall demand for electricity, yielding economic and environmental advantages. From a government's perspective, including DSM in energy policies ensures that electricity can be used efficiently and a reliable supply properly planned for.

Case Study

- 5.3.8 Growing concern about **climate change** and the human contribution to greenhouse gases has prompted governments to launch energy efficiency plans in recent years. Chile, Venezuela, Cuba and most recently the European Union and Australia have put in place plans to reduce carbon emissions through various measures, among them better energy efficiency and the use of renewable energy sources. Below, we look at the EU's and Australia's plans.

The European Union

- 5.3.9 Twenty-seven European countries have agreed to specific targets to cut greenhouse gas emissions by 20 per cent from 1990 levels and to generate a fifth of all energy from renewable resources. Under the agreement struck on 9 March 2007 these targets are to be achieved by the year 2020.
- 5.3.10 The European Union has also set the ball rolling on studying whether to mandate energy efficient bulbs for all homes and street lights, and ban traditional bulbs

by 2009. It has been calculated that by abandoning old-fashioned light-bulbs, the EU will generate 20 million fewer tonnes of carbon emissions a year, and each household will use 60 per cent less electricity.

- 5.3.11 With the broad strokes agreed, it has been left to the European Commission to draw up detailed plans on how to implement the package. This includes "**horse-trading**" among the member states over how to share the burden to realise the goals.
- 5.3.12 The compact includes a pledge – and a challenge to other countries – for the EU to go beyond the 20 per cent cut to 30 per cent if an agreement can be made with the United States and what have been described in the press as "other key countries".
- 5.3.13 All member states also agreed that at least 10 per cent of their transport needs will be powered by bio-fuels by 2020.
- 5.3.14 The pact stipulates that 20 per cent of all energy consumed in the Union must be from renewable sources such as wind and solar power. But within that overall target is flexibility on how much each member country contributes.

Australia

- 5.3.15 Australia has **mandated** the use of energy efficient light bulbs, and will phase out incandescent light globes by 2012. Under the plan, which was announced on 20 February 2007, it is expected the country's annual greenhouse gas emissions will fall by 4 million tonnes by the target date.
- 5.3.16 Lighting represents 12 per cent of greenhouse gas emissions from Australia's households and 25 per cent from its commercial sector.
- 5.3.17 The switch from incandescent bulbs is expected to cut household electricity bills by up to 66 per cent, through the more efficient conversion of electricity to light in new globes – old bulbs wasted 90 per cent in heat; new bulbs use 20 per cent of the electricity to produce the same light, and can last four to ten times longer.
- 5.3.18 Australia's Federal Government is to work with state and territory Governments to gradually enforce the new lighting standards, while considering special needs, such as medical lighting and oven lights.
- 5.3.19 It also plans to work with bulb makers, including those in China.

Context for Hong Kong

- 5.3.20 In May 2000, the Government signed agreements with CLP Power and Hongkong Electric Co Ltd (HEC) to implement DSM programmes, in pursuing its policy to promote DSM efficiencies and conservation. During the three-year scheme, \$106 million in **financial support** was given to help commercial electricity users implement DSM measures.

5.3.21 Separately, the Government has implemented other initiatives to promote DSM, based on energy efficiency and conservation. It:

- has established Building Energy Codes for building design;
- has identified Energy Management Opportunities Pilot Projects through energy audits to retrofit buildings;
- operates the Voluntary Energy Efficiency Labelling Schemes for household appliances and office equipment; and
- has created an Energy End-use Database to facilitate the formulation of energy policy.

5.3.22 For their part, CLP Power and HEC provide customer advisory services to promote energy efficiency and conservation.

5.3.23 However, to further encourage DSM we should focus on how to engage **domestic and commercial consumers** to conserve and use energy more efficiently. Experience internationally has raised particular considerations regarding implementing DSM in Hong Kong and engaging key stakeholders. These are:

Actions and Responsibilities: Applying DSM

5.3.24 Most energy is consumed in residential and commercial premises: how, then, can DSM be used to promote the wider application of **building-related** energy savings?

5.3.25 How can DSM leverage on other market mechanisms, like the use of **green labelling** for buildings with superior energy performance, and is there an appeal for such buildings on the property market?



Actions and Responsibilities: Setting and Achieving DSM targets:

5.3.26 Considering the advantages of setting a DSM target: what would be an **acceptable** or a **reasonable** target? How do you think DSM measures like energy efficiency and conservation can be applied effectively to improve air quality?

5.3.27 How might energy users be motivated to achieve DSM targets?

5.3.28 What **rewards** would be appropriate for achieving DSM targets?

5.3.29 The independent **verification** of DSM results is crucial. How best can results best be verified? Who would verify the achievement of such targets?

Actions and Responsibilities: Promotion of DSM

5.3.30 There is a role that the **major energy users** might play in promoting DSM. In particular, in what ways might corporations and property companies, the railway operators, the airport, and public services like hospitals and schools lead by example?

5.3.31 Where can they realise significant economic benefits while practising DSM?

5.3.32 These users may work with the utilities to find **innovative ways** of saving energy and at the same time share benefits: they may consider using performance contracts, which enable all parties to initially invest in energy efficiency measures but later divide up the returns arising from cost savings. What else can be applied?

5.3.33 In buildings, the integration of sound **design and construction** practices into their planning, as well as their operation and processes can benefit the environment and contribute to energy efficiency.

5.3.34 Within the buildings, there is a need to shift individual users away from **wasteful habits** like overcooling or excessive lighting in homes and offices, whilst still maintaining acceptable levels of comfort.

5.3.35 Among the energy producers, how might the **gas and electricity utilities** play key roles in promoting DSM amongst the wider public, even with the institutional and technical constraints within which they operate?

5.3.36 Where might we find suitable methods and incentives for the utilities to promote DSM?

5.3.37 How might the utilities be encouraged to co-operate with their customers to implement such initiatives, and share the rewards?

5.3.38 Can **preferential adjustments** be made to tariff levels for energy savers as is the current case for off-peak electricity?

Questions for Stakeholders

5.3.39 In discussing this subject stakeholders are invited to consider the following questions:

- a) Do you support new policies to promote demand side management that will address the direct link between energy consumption behaviour and air pollution caused by electricity generation?
- b) What new policies would you support to achieve DSM energy targets and which ones should be made mandatory?
- c) What new incentives and/or policies should Hong Kong adopt to encourage energy efficiency and reduce peak energy demand?

6 Getting Your Views on Record

What do we do next?

- 6.1 This document is mainly concerned with the issues of air quality and its possible impact on Hong Kong's sustainable development. The choices we make in this area will determine how we will build a better community for ourselves and for future generations.
- 6.2 When you respond to this document, we very much hope that you will bear this point in mind.
- 6.3 We welcome feedback on the issues presented here, in particular on the specific questions posed in the previous section. The SDU has also prepared pamphlets that summarise the issues and provide question-and-answer sections for feedback. We look forward to receiving further information, suggestions or questions that you might have relating to the consultation topics. You are also welcome to respond to the issues raised in the Council's 2006 report on air quality. Your views will help to shape the advice that the Council for Sustainable Development will give to the Government with regard to tackling the air quality challenges for Hong Kong.

What are the channels for response?

- 6.4 In the coming months, the Council will work with partner organisations from various sectors to implement a programme of events aimed at encouraging people in the community to comment on the issues presented in this document. We will reach out to a wide group of stakeholders and concerned citizens, including district-based organisations, students, business and civil sector groups.
- 6.5 As well as co-ordinating public events, we have an open and interactive channel of communication through the Council's website at www.susdev.org.hk. Through this website, we will provide a regular update on events, host an interactive "chat-room" on the engagement process and provide a regular electronic bulletin on related issues.
- 6.6 We would also be glad to receive comments by post, through the office of the Council Secretariat by **15 October 2007** at: -

The Sustainable Development Unit

M/Floor, Murray Building
Garden Road
Central.

Email: comments@susdev.org.hk

Can your views make a difference?

- 6.7 In responding to this document, whether through participation in public hearings, and workshops, on-line discussion or by sending in your written comments, you will be contributing to the sustainable future of our city. One of the most important parts of the process of building any strategy for sustainability is the partnership between all sectors of society in debating the issues and working towards a consensus on the way forward. In this respect, the choices that you make when commenting on the issues raised here will make a real difference.
- 6.8 This engagement process represents a new way of involving the community in shaping Government policies. We hope that it will provide a platform for a wide range of ideas and suggestions from all sectors of our society. The success of this initiative depends largely on the response that we get to this document. We urge stakeholders to join the discussion on the choices that we need to make to ensure a sustainable Hong Kong for the benefit of this and future generations.

Annex

Terms of Reference and Membership of the Council for Sustainable Development

Terms of Reference -

- To advise the Government on the priority areas it should address in promoting sustainable development;
- To advise on the preparation of a sustainable development strategy for Hong Kong that will integrate economic, social and environmental perspectives;
- To facilitate community participation in the promotion of sustainable development in Hong Kong through various means, including the award of grants from the Sustainable Development Fund; and
- To promote public awareness and understanding of the principles of sustainable development.

Membership -

Chairman: **Chief Secretary for Administration**

Vice-chairman: **Dr. Edgar Cheng, G.B.S., J.P.**

Members: **Dr. Lily Chiang**

The Honourable Choy So-yuk, J.P.

Mr. Barrie Cook

Ms. Christine Fang, J.P.

Mr. Hans Michael Jebsen, B.B.S.

Mr. Thomas Kwok, J.P.

Mr. Michael Lai, M.H., J.P.

Professor Lam Kin-che, S.B.S., J.P.

Ir. Otto Poon, B.B.S.

Mr. Tai Hay-lap, B.B.S., J.P.

Professor Tsui Lap-chee, J.P.

Secretary for Economic Development and Labour

Secretary for the Environment, Transport and Works

Secretary for Health, Welfare and Food

Secretary for Housing, Planning and Lands

Terms of Reference and Membership of the Strategy Sub-committee

Terms of Reference -

- a. To assist the Council for Sustainable Development with the formulation of a Sustainable Development Strategy for Hong Kong;
- b. To engage stakeholders and the community and implement a consultation programme as agreed by the Council for Sustainable Development with a view to ensuring that the Sustainable Development Strategy is inclusive and widely accepted by the community; and
- c. To report regularly to the Council for Sustainable Development on progress with the formulation of the Sustainable Development Strategy.

Membership -

Chairman: **Ir. Otto Poon, B.B.S.**

Members: **Dr. Lily Chiang**

The Honourable Choy So-yuk, J.P.

Mr. Hans Michael Jebsen, B.B.S.

Professor Lam Kin-che, S.B.S., J.P.

Ms. Carmen Chan, J.P. *

Dr. Chan Wai-kwan, J.P. *

Dr. Anissa Chan, M.H. *

Mr. Chua Hoi-wai *

Ms. Anne Copeland-Chiu *

Dr. Susan Fan *

Mr. Albert Lai *

Dr. Alexis Lau *

Mr. Chandran Nair *

Dr. Ng Cho-nam, B.B.S. *

Dr. Andrew Thomson *

Mr. Ali Tuet *

Ms. Luciana Wong *

Professor WONG Siu-lun, B.B.S., J.P. *

* Co-opted Members

Terms of Reference and Membership of the Support Group on Better Air Quality

Terms of Reference -

- a. To compile an Invitation and Response document, with reference to the information gathered by the Study Group on Better Air Quality and appropriate reference to local and international experiences.
- b. To design and implement the public involvement stage of the engagement process for public discussion of the Invitation and Response document and related issues.
- c. To present the Invitation and Response document to the public and facilitate interactive discussion by stakeholders, with a view to building consensus.
- d. To receive and collate responses from stakeholders, with a view to making recommendations to the Strategy Sub-committee and Council for Sustainable Development.

Membership -

Convenor: **Mr Chandran Nair**

Members: **Ir Otto Poon, B.B.S.**

Dr Chan Wai-kwan, J.P.

Dr Alexis Lau

Mr Stephen Fong

Dr Ng Cho-nam, B.B.S.

Mr Yeung Ka-sing, S.B.S., J.P.

Mr Tse Long

Dr Alfred Tam

Mr Billy Leung

Dr Chan Yan-chong

Mr Lam Kin-lai

Representative from Economic Development and Labour Bureau

Representative from Environment, Transport and Works Bureau

Representative from Environmental Protection Department

Representative from Economic Analysis and Business

Facilitation Unit, Financial Secretary's Office