

22 May 2007

Members of the Panel on Environmental Affairs

Hong Kong Legislative Council

Jackson Road

Hong Kong

Dear Members,

**Re: Submission on Greenhouse Gas Emission and its effect on Global Warming
- Meeting on Monday, 28 May 2007 at 2:30 pm**

Thank you for the invitation to present views on measures to reduce greenhouse gas emission, we would like to submit the following views:

I. Background

1. Climate change has a number of distinct characteristics which are different from other forms of pollution: its causes and consequences are global, its impacts will persist for a very long time; and the related uncertainties and risks are going to be large and crucial to life as we know it.
2. There is growing international efforts to negotiate post-Kyoto reductions of GHG emissions from 2012 in order to keep the rise of GHG levels to an agreed level and then to bring them down.
3. There is increasing international focus on how to 'decarbonise' and for economies to become 'low-carbon' in order to stay competitive. GHG emissions are likely to be priced into economic activities in the future, which is expected to encourage people away from carbon-intensive goods and services because they will be more expensive.
4. For a city economy such as Hong Kong to substantially cut GHGs, there must be a comprehensive and continuing effort to improve energy efficiency across a number of sectors. This involves:

1

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- Maximising efficiency gains in power generation, transportation, and buildings; and
 - Using the energy regulatory system (SoC) to further incentivise and reward efficiency.
5. To achieve these ends, having a management vision within both the public and private sectors is essential. Political and business leaders must focus on making the necessary management change and apply technology (low and high tech) to change modes of operation to achieve efficiency gains.
 6. Governments need to look at optimising both command-and-control methods to reduce emissions, as well as consider how market mechanisms (such as tax and emissions trading) can help.
 7. Considerable worldwide effort is and will continue to go into finding mechanisms to price GHGs. The international financial sector is becoming more and more active in using the 'flexible mechanisms' under the Kyoto Protocol.¹
 8. Hong Kong as a finance centre should explore developing a trading platform for carbon and other emissions, which the Hong Kong Exchanges and Clearing Limited is doing.
 9. As for CDM, there are already companies actively doing such business out of Hong Kong. They use Hong Kong as a platform for regional CDM business.

II. HKSAR Government's Position

10. The HKSAR Government's position is that:
 - Hong Kong's Kyoto commitments are tied to that of China's and there is no commitment to limit or reduce GHGs;²
 - Hong Kong's GHG emissions per capita at around 6.4 tons (in 2004) represent a reduction of 7% as compared to 1990, implying that Hong Kong is already ahead of other jurisdictions;³
 - Hong Kong's electricity consumption per person is relatively low;⁴
 - Government policy is for Hong Kong to be more energy efficiency through (a) encouragement to keep air conditioning at 25.5 degree C, (b) mandatory labeling and (c) public education; and⁵
 - The Government is conducting scientific research relating to climate change.⁶

III. Going Forward

11. Hong Kong should adopt a more aggressive climate change position because Hong Kong has the capacity to go further. London, for example, has committed itself to reducing its CO₂ emissions by 20%, relative to 1990 level, by 2010.⁷ The financial services sector in London is also making major efforts to become a carbon financing centre.
12. The first step is for Hong Kong to create its own climate change policy. Perhaps with the reorganisation of ministerial portfolios in July 2007 with Environment and Energy being put under one roof that will present opportunities for the HKSAR Government to consider a forward-looking climate change policy. But this will only happen with a decision from the top to do so. Moreover, the renegotiation of the Schemes of Control provides a most important opportunity for Hong Kong to provide the right incentives to the utilities to help customers to achieve higher cost savings while enabling the utilities to profit from efficiency gain.
13. Hong Kong should take note of the national goals to reduce energy cost for per unit GDP by 20% by 2010, and to derive 15% of its energy from renewables by 2020. Hong Kong can see how it can play a leading role in achieving the maximum gains between 2007 and 2010.
14. Hong Kong should particularly look to ways to encourage Hong Kong owned and managed business in the Pearl River Delta to reduce their GHG emissions. This will have the benefit of putting them into a more competitive position when GHG missions are priced and energy costs rise. In the near term it will also improve regional air quality.

¹ The three mechanisms are Emissions Trading, Clean Development Mechanism (between developing and developed economies), and Joint Implementation (between developed economies and coming into effect in 2008).

² According to the Kyoto Protocol, China (including the Hong Kong) is not required to commit to limiting or reducing GHGs, but has to submit national communications in accordance with UN-specified requirements. Hong Kong has to provide information to the Central Government on its (a) GHGs inventories; (b) mitigation and adaptation measures; (c) activities to promote relevant technologies; (d) scientific research; and (e) activities to raise public awareness. China needs to submit its national communication within four years after obtaining the first payment of funds for compiling such communication from the relevant organization of the UN. Hong Kong is expected to submit the relevant information to the Central Government around 2010 and the government will prepare the information in the coming two years.

³ Paragraph 65, Policy Address, 2006.

⁴ According to the data provided by Asia-Pacific Economic Co-operation and used by the government, the average electricity consumption in Hong Kong was 5,600 units per person, which was lower than the figures of about 12,000 units in USA, 16,000 units in Canada, 7,600 units in Japan and 7,400 units in Singapore.

⁵ Mandatory labeling for refrigerators, air conditioners and coolers, and compact fluorescent lamps (70% of domestic electricity consumption). After the introduction of the mandatory scheme, the government estimated that Hong Kong could save about 150 million units of electricity consumption and reduce CO2 emission by 105,000 tones per annum.

⁶ HKO has been studying the relationship between climate change and meteorological factors, rainfall and changes in the sea level as well as the future trends; EMSD has explored the possibility of using renewable energy in Hong Kong; and EPD has studied possible measures to control GHGs and has made summary assessments in several areas such as the impact of climate change on energy consumption in Hong Kong.

⁷ The Mayor of London has set up the London Climate Change Agency (LCCA) to be a key driving force in accelerating reductions. The LCCA has been set-up in partnership with private sector firms to design, finance, build and operate low and zero-carbon capacity. This will be a combination of combined cooling, heat and power, energy efficiency, renewables and other innovative technology in new developments and retrofit projects.

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Dear Members,

**Re: Additional Submission on Greenhouse Gas Emission and its effect on
Global Warming**

Energy Efficiency

The energy sector of the global economy is highly inefficient. Power plants, generators and buildings waste huge amounts of heat; vehicles dissipate much of their fuel energy; and consumer appliances waste large quantities of power.

Improving energy efficiency is the fastest and least-costly way to create less pollution and a climate-safe energy system. It has so far not been adopted aggressively by governments and business due to many fundamental misunderstandings about what 'energy efficiency' means.

I: Understanding Efficiency

'Efficiency' means different things to different people, and the different perspectives have hindered policy-makers and business from fully appreciating the potentials of energy efficiency.¹

'Efficiency' in the context of energy efficiency needs to be understood from the perspective of physical output/input, but its full benefits goes well beyond accounting for direct costs savings (e.g. fuel cost). The problem is other savings remain invisible – namely, capital costs (large amounts of energy are lost at every stage of production to delivery), pollution (waste), climate change and energy security.

¹ Some think of it in terms of the physical output/input ratio while others think of it as the monetary output/input ratio. The former is an engineer's perspective. The latter is an economist's perspective. Some also look at efficiency as the economic optimal of a market transaction process, which is another economic approach. From the economist's perspective, there is often also an assumption made that efficiency gains must have already been captured, which if examined from the physical output/input perspective, is mostly untrue, see *Natural Capitalism* by Paul Hawken, Amory Lovins and Hunter Lovins.

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Energy efficiency (i.e. doing more with less) is often confused with energy conservation (and this is often misinterpreted to mean curtailment). Moreover, achieving energy efficiency involves technological improvements, behavioural change and policy tools (by affecting price) to induce/reward changes all of which need to be configured, which raises the level of complexity for decision-makers in government and business.

It is therefore easier for policy-makers and business to focus on providing supply (including renewables), which is visible (e.g. plants and equipment) than efficiency (savings are invisible). Moreover, energy statistics are compiled to show output and consumption. There is usually no statistics on the end-uses/services provided, which results in efficiency potentials being overlooked.²

The reasons identified above contribute to the reason why pursuing aggressive energy efficiency policy has been neglected all around the world.

II: 'Efficiency' Potentials

As most of the energy being used is currently being wasted, there are enormous energy efficiency potentials to tap.³ The most obvious potential opportunities include:

- (i) Power generation (conventional) – efficiency gains can be achieved all along the energy conversion chain.⁴
- (ii) Buildings (homes, offices, factories) – technical improvements in energy efficiency can be applied to new buildings or when a building is retrofitted or renovated.
- (iii) Transportation – efficiency gains can be achieved through redesigning vehicles that are light in weight and fuel efficiency.
- (iv) Demand-side management (DSM) – by load management and when energy is delivered.

² Overlooked efficiency opportunities include such things as distribution losses, useless services like leaving equipment on continuously, heating/cooling simultaneously etc. Other benefits such as greater energy security, climate benefits etc are not usually counted.

³ The American Council for an Energy Efficient Economy estimated the adoption of efficiency measures in industrial improvement, light-vehicle standards, cogeneration, building codes and central air conditioning alone would be equivalent to the total primary energy used in Australia, Mexico, Spain, Austria and Ireland in 2000. The Rocky Mountain Institute's *Winning the Oil Endgame*, sponsored by the Pentagon (2004) shows enormous energy savings potentials. The Stern Review on the Economics of Climate Change (2006) recognises energy efficiency to have major potentials.

⁴ There are potential efficiency gains from plant losses, transmission and distribution, as well as motor, pump, throttle and pipe losses.

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III: Energy Efficiency and Culture

Another important aspect of achieving high energy efficiency relates to what habits and culture public policy encourage. Thus, the setting of indoor temperature and intensity of lighting, and whether a society gets used to a car culture or a public transport culture makes a great difference.

IV: Energy Intensities – Developed vs. Developing Economies

There are enormous potentials to improve energy efficiency in developing economies. Developing countries' primary energy/GDP intensities average ~3x those of industrialised countries. Corrected for purchasing power, China's energy intensity is ~3x that of the US, ~5x that of the EU and ~9x that of Japan. Fast-growing economies like China have the greatest opportunity to aggressively pursue energy efficiency.⁵

Moreover, developing economies can produce energy efficiency products (e.g. light bulbs and other lighting products, air-conditioners, pumps, solar panels etc) at lower costs and thus shorten investment repayment dramatically.

V: Policy Recommendations

Increasing energy efficiency is thus the largest, least expensive, most benign and often the quickest way to provide energy services. The following are do-able initiatives for governments to take action and will have substantial impact:

1. **Review energy and building codes, and fuel efficiency standards** – to optimise energy efficiency.
2. **Use procurement as an efficiency driver** – governments can spur efficiency by using its buying power to incentivise energy efficiency.
3. **Apply 'feebates' to promote efficiency** – regulators can charge fees on inefficient models (of vehicles, aeroplanes etc) and return the revenue collected as rebates to buyers of efficient models.
4. **Restructure regulatory arrangements to reward utilities for efficiency** – not for selling more energy so they have an incentive to provide energy more efficiently to customers and at the same time reduce customers' bills – i.e. regulators can allow utilities to keep some of the savings from reducing customers' bills (the 'negawatt' – saved watt – engineered-service-delivery model).⁶

⁵ China's 11th 5-Year Plan has a major focus on energy efficiency. See briefing paper for the September G8+5 Climate Change Dialogue.

⁶ Utilities will then help customers to implement retrofitting to capture savings, as was shown in California in the early 1990s.

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