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Hon. Chan Hak-kan
Chairman, The Panel on Environmental Affairs
Email :

By Email

Dear Mr. Chan,

WWF's submission to Public Consultation on the impacts of the development of nuclear energy for local power generation

In response to the invitation for submissions to the public consultation on the impacts of the development of nuclear energy for local power generation against the climate strategy and action agenda, we are pleased to prepare the following comments and suggestions for your consideration.

Summary

- WWF is pleased to see that the Hong Kong Government has proposed a carbon reduction target for the city. However, we believe the range is excessively large in real terms, and encourage the Government to reduce the range and focus on the most ambitious end of the target range to ensure that Hong Kong effectively drives to a low carbon future.
- With regard to the approach used to achieve the carbon reduction target, WWF believes that such a heavy focus on a nuclear “quick fix” would be a major missed opportunity to transition to a genuine low-carbon economy. We feel it is contradictory to the spirit of developing Hong Kong into a Low Carbon Economy as promulgated in the Chief Executive’s Policy Address in 2008. Almost 70% of carbon reduction stated in the proposal comes from changing the fuel mix, reducing the imperative to seriously engage different sectors and communities in Hong Kong in energy efficiency and low carbon lifestyle initiatives.

- WWF and Ove Arup & Partners Hong Kong jointly produced a carbon reduction Roadmap 2020 for Hong Kong (Appendix I). The study shows that Hong Kong has the ability to achieve at least 61% reduction in carbon intensity by 2020 (2005 base level) without increasing the nuclear power in the energy mix (or equivalent to 25% reduction in absolute carbon emissions by 2020 - 1990 base level).
- WWF is disappointed that the Government has demonstrated no policy determination to decrease our overall energy needs through the setting of an aggregate absolute energy reduction target. Hong Kong should follow other developed cities in carrying out large-scale energy saving and conservation programmes instead of increasing the energy supply from nuclear power, which indirectly encourages wastage. The Hong Kong government should set a vigorous reduction target of 25% for Demand Side Management (DSM). The target can be achieved by legislation and different energy efficiency measures contributed by electricity utilities, improvements in energy efficiency in building, appliances, transport and others.
- All sectors should be engaged to carry out DSM energy conservation measures in order to achieve our carbon reduction target. The Hong Kong Government can achieve its carbon reduction target through increasing natural gas supply and the implementation of measures such as green building practices, low carbon appliances, behavioral change and crucially, a reform in the electricity tariff system and Scheme of Control. Such measures will also help Hong Kong create a large number of economic and employment opportunities.
- Additionally, Hong Kong's carbon Footprint associated with embodied carbon is not covered at all in the Climate Change Strategy and Action Agenda, but should be. The Hong Kong Government should start to address the high proportion of the carbon Footprint emitted elsewhere to supply imports to Hong Kong, by educating the community on this new area of concern, and leading change through the introduction of procurement policies for Government favouring goods and natural resources with relatively lower embodied carbon.
- With regards to vulnerability and adaptation, a more informed understanding of climate-related risks than estimates of net global risks is important. Given that the adaptation and hedging is best done at a local or regional level where descriptions of risk can more accurately reflect characteristics that are path dependent and site specific, local and regional studies on the climate impact towards biodiversity should be carried out promptly. Funding needs to be made available to initiate wide-scale research in a number of key areas.

Specific comments and suggestions

1) Emissions Target

- Over the past two years, WWF has proposed that the Hong Kong Government follow the International reduction target for developed cities such as Hong Kong suggested by the Inter-Governmental panel on climate change (IPCC) i.e. 25% reduction by 2020 (based on 1990 level). The Hong Kong Government, however, has adopted carbon intensity instead of absolute carbon emission as the indicator for reduction. WWF points out that the proposed emissions reduction target (50% - 60% carbon intensity reduction target) by the Government is excessively broad (the actual emission reduction would be 19%-33%, 2005 base level). The reduction target range is large in real terms (one fifth vs one third reduction), making it difficult for the public to gauge the underlying determination of the Government. WWF is concerned that if the lower reduction target (19% reduction) is adopted, some of the available measures to improve energy efficiency will never be implemented. WWF believes the range is excessively large in real terms, and encourages the Government to reduce the range and focus on the most ambitious end of the target range to ensure that Hong Kong effectively drives to a low carbon future. Hong Kong should go for a reduction target for 60% or above in terms of carbon intensity by 2020. WWF also proposes a longer term of commitment by reducing at least 76% by 2030 and 90% by 2050 in Hong Kong. (Details please refer to the Appendix I: WWF-Arup Carbon Reduction Roadmap)

2) Reasons to oppose increasing reliance on nuclear power

Climate change is the biggest challenge that all species on the Earth are facing, including humans, polar bears, green turtles and in fact the entire biosphere. Increasing the nuclear power supply is not a sustainable way to reduce carbon emissions and the potential risks and hazard caused by nuclear reactors remain of major concern.

No need to increase

- Hong Kong can achieve the carbon reduction target without importing more nuclear energy. The Roadmap in the Annex covers the Demand Side measures that can be taken in order to achieve a more aggressive emissions target. Following WWF's Roadmap will achieve a 37% reduction in carbon emissions using 2005 as base year. The high side of carbon reduction target of 61% can be achieved without additional nuclear power.

Safety and environmental issues

- An increase in purchasing nuclear energy will result in having more reactors in the vicinity of Hong Kong. The incident of a defective fuel rod at the Daya Bay Nuclear Plant earlier this year has highlighted that the public are still not nearly familiar enough with contingency plans for responding to any possible case of radioactive leakage.
- Uranium mining is a polluting process that devastates large areas. The remaining wastes, which contain large amounts of radioactivity remain at the mines. These wastes if stored in a very poor condition will result in the contamination of surface and groundwater.
- Two basic types of nuclear waste, i.e. high-level nuclear waste, such as the used fuel rods and low-level radioactive waste, such as staff' clothing and glove pose a potential threats to environment and humans if they are not probably handled and stored.
- High-level nuclear waste (spent fuel) is literally about one million times more radioactive than when the fuel rods were loaded into the reactor. This waste without shielding can kill human within minutes and will be hazardous for millions of years. No technology currently exists to keep it isolated for this long period of time.
- Natural uranium contains 99% U^{238} and about 0.7% U^{235} . To be used as a fuel for reactor, large amounts of U^{238} must be removed to increase the proportion of U^{235} with a 4% - 5% concentration in the uranium enrichment process. This gaseous diffusion process requires large amounts of electricity to obtain the enriched uranium and in the past has also released the ozone depleting CFC greenhouse gas with higher Global Warming Potential), had contributed to climate change.
- While Hong Kong has a small and crowded land-area, it should take responsibility for dealing with the waste it generates. The current proposal, while opaque on the location of new nuclear reactors to supply Hong Kong, is largely transferring the social and environmental risks associated with nuclear power generation to our neighbor Guangdong in a way that appears to avoid such responsibility.
- From an international perspective, WWF does not see the emergence of a serious nuclear renaissance in Europe. The nuclear industry has responded to past accidents, but improvements in the latest generations of nuclear facilities are barely proven. The 3rd generation nuclear system using European Pressurized Water Reactor (EPR) – Olikuoto-3 now being built in

Finland has experienced three years' delay in construction, over-budgeting of 50% together with 3,000 construction errors.¹

- According to the U.S. Department of Energy, the 4th generation of nuclear power plants will not be commercialized until 2030, and it may not be until 2040, that the first nuclear plant based on this technology will be built and fully tested. The current nuclear facility at Daya Bay is 2nd generation technology, which was developed in the 1970s.

High cost

- WWF estimates that if the proportion of nuclear power increases to 50% in the energy mix from 2015, Hong Kong will need to spend at least HKD 16 – 17 billion purchasing nuclear energy every year.

Low efficiency and flexibility

- According to the experience from other countries, investment in energy efficiency and renewable energy will save cost and time in comparison with developing new nuclear power. It usually takes 5 to 10 years to build a nuclear plant and delays are common. In the case of Hong Kong, it will take at least 8 years to complete merely the cabling for electricity transfer. There are many other better technology and energy options for consideration.

Not without impacts to the environment

- WWF does not support the use of nuclear power to reduce greenhouse gas emissions. The entire nuclear fuel cycle, including the processing of nuclear raw materials from nuclear mining and milling, and the construction of nuclear power stations consumes a vast amount of fossil fuels compared to building other power plants. In addition, the decommissioned nuclear site cannot be used for other purposes due to the contamination by radioactive waste and violates the principle of sustainable development.

Threats to wildlife and human

- Reactors require huge amounts of cooling water, which can be as much as tens of millions of gallons per day. The massive intake of water into the nuclear reactor will cause physical trauma and mortality to delicate fish and

¹ The World Nuclear Industry Status Report 2009, With Particular Emphasis on Economic Issues, German Federal Ministry of Environment, Nature Conservation and Reactor Safety, August 2009

invertebrate larvae and eggs sucked into the cooling system, and likely including those of commercial important species.

- Wastewater is discharged at higher temperature than the intake water. This may adversely affect marine life in the vicinity of the discharge.
- The event of an accident resulting in cracked rods of nuclear plant could release radioactive iodine into the water that surrounds and cools the fuel rods. This may then circulate with the cooling water throughout the system, ending up in the airborne, liquid, and solid wastes from the reactor, and potentially make its way into local ecosystems and food.

Public says “No” to additional nuclear

- Over 33,000 signatures have been collected through the joint petition of three green groups, WWF, HK Friends of the Earth and Greenpeace within 3 months. According to the content of ‘One person, One Letter’ campaign organized by WWF, over 7,000 signatures collected within 2 months from the public, who supported reducing the overall energy consumption of Hong Kong as first and as the priority, rather than importing additional nuclear power in order to avoid the risks associated with additional nuclear power plants and unnecessary tariff increases.

3) Promotion of Natural Gas and Renewable Energy to replace coal

Natural Gas Supply

- Natural gas can act as a natural bridge fuel between the dominant fossil fuels of today and the renewable fuels of tomorrow.
- According to International Energy Agency (IEA)’s forecast, the global natural gas reserves can last for at least 250 years. The natural gas reserve in the U.S. can fulfill the needs for the coming 100 years according to Energy Information Administration (EIA) 2009. According to BP Statistical Review of World Energy, June 2010, China’s proven reserve in 2009 was 2.46 trillion cubic meters. China is ranked high in terms of the amount of natural gas reserve notwithstanding the potential exploration in the future through advanced geological investigation. China could have 26 trillion cubic meters of shale gas according to IEA’s preliminary estimation. (The environmental impact brought by the production of shale gas must be properly addressed).
- The International Energy Agency estimates China’s shale gas reserves at 26 trillion cubic metres. Proven shale gas reserves in the US were reported by

the Energy Information Administration to be 32.8 trillion cubic metres. The Strategic Research Centre for Oil and Gas of China's Ministry of Land and Resources set a goal in early 2010 to locate one trillion cubic metres of recoverable shale gas reserves, build 15-30 billion cubic metres of production capacity and produce 8-12 percent of China's natural gas from shale gas wells by 2020.

- Australia serves as the hub of Asian natural gas. Recently, Central Asia has increased the supply of natural gas to China. Hong Kong should leverage the advantages in using natural gas to replace carbon-intensive coal. Under a Memorandum of Understanding (MOU) signed in August 2008, Hong Kong has the opportunity to draw natural gas from three sources from China: 1) new gas fields planned to be developed in the South China Sea; 2) second east-west gas pipeline bringing gas from Turkmenistan; 3) a Liquefied Natural Gas (LNG) terminal to be located in the Mainland.
- In Hong Kong Government's Air Quality Objective (AQO) document, the options of 50% and 75% of natural gas in the energy mix were once proposed in order to address the air quality issues.
- Given the ample supply of natural gas in Asia as well as China, there is no reason to reject the option of increasing the proportion of natural gas for Hong Kong and replace the option of increasing nuclear, which generates waste that will be hazardous for millions of years.
- In scenario 2 stated in the proposal, the portion of renewable energy in the energy mix can reach 15% by 2030. WWF urges the Government to increase the proportion of renewable energy to at least 10% by 2020. Regional cooperation, including the renewable energy transferred from Guangdong to Hong Kong could be an option and supported by the scholars in Hong Kong.

4) Demand Side Management – Real solution to combat climate change

- WWF believes that the argument that the world should re-embrace nuclear power is seriously flawed. Investment into nuclear power projects can drain badly-needed funds from energy efficiency and renewable energy programmes, most of which have substantially lower specific greenhouse gas abatement costs than nuclear energy. Nuclear technology does not create incentives for energy savings. It is a base-load technology whose energy output cannot be adjusted to specific consumer and industrial demand.
- Demand Side Management (DSM) refers to measures that can reduce peak electricity demand within the electricity grid system as well as reduce the energy consumption of end users (without sacrificing quality of service and user comfort).

- The DSM approach proposed by WWF aims to prevent the need to expand the current electricity infrastructure, which would require the expansion of generating facilities, power purchases, and transmission and distribution capacity as well as finding new sources of power.
- DSM measures include regulating power utilities so that they provide energy efficiency and conservation programs, financing programs to assist customers in paying for DSM measures, installing energy-saving equipment and smart metering directly, as well as providing incentives for consumers' behavioral changes. The implementation of DSM measures has met with success in many developed cities, significantly reducing primary energy use and therefore reducing carbon dioxide emissions. Numerous studies in China and other countries have found that cost-effective DSM programs can reduce electricity usage and peak demand by approximately 20 to 40%.²
- In the case of the U.S., according to Mckinsey's report³ based on a holistic approach and a program executed at scale, the energy and operational savings from energy efficiency could total some US\$ 1.2 trillion and require only an initial upfront investment of approximately US\$ 520 billion. Such a program has the potential to reduce end-use energy consumption in 2020 by roughly 9.1 quadrillion BTUs, **roughly 23 percent of projected demand**, potentially abating up to 1.1 gigatons of greenhouse gases annually. This reflects a lower unit cost that can be acquired by energy efficiency measures compared to buy nuclear power.
- Reducing energy consumption should be the main direction instead of increasing the energy supply to encourage continuous wastage. In the case of Hong Kong, using a similar rate of return, saving same amount of power through energy efficiency measure should require only HK\$ 5 billion, in comparison to an estimated \$ 16 - 17 billion to buy additional nuclear power (see 2. High cost).

WWF urges the Government to:

- 1) *Adopt an ambitious energy conservation target for Hong Kong to reduce Hong Kong's total electricity consumption by 25% by 2020 (1990 base year), and enact strong supporting policy and regulatory measures to enable the target to be achieved.*
- 2) *Provide economic incentives, such as tariff rebates, to encourage the business and residential sectors to reduce energy consumption.*

² Nadel, S., Yang, Z. and Shi, Y., (2004), Integrated Resources Planning and Demand-Side Management, Manual for China and Other Developing Countries.

³ Unlocking Energy Efficiency in the U.S. Economy, Mckinsey Global Energy & Material, July, 2009

3) *Review the Scheme of Control in 2014 and require the power companies in Hong Kong to implement active energy consumption reduction measures.*

Overseas Examples of Energy Efficiency Measures:

Taiwan

- Residential users may enjoy an additional 5% - 20% discount in the electricity tariff if they have been proven successful in slashing their current electricity consumption compared to the same period of time in the previous year. In short, energy-smart users in Taiwan can not only save on their energy consumption but also gain an additional saving from their electricity bill with additional discounts. The incentive scheme has helped achieve a savings of 4.5 billion kWh, which is equivalent to 60% of the annual residential electricity consumption of the city of Taipei in one year.

U.S. (save 7,000 GWh of electricity over the period 2010 to 2012)

- California has been implementing a cash rebate program for the purchase of electrical appliances. Consumers will receive a cash rebate from the power utilities when purchasing highly energy-efficient appliances.

U.K. (18% energy saving by 2016)

- The UK Government requires all power companies with a customer base more than 50,000 to set carbon reduction targets. The companies have to reduce their emissions by assisting their consumers in reducing energy consumption through different measures, such as changing efficient light bulbs for customers or assisting them with the installation of the cavity wall for better insulation
- The UK Government by legislation requires that the electricity utilities provide energy saving services to homes by installing energy saving equipment, smart meters, and insulation in order to lower energy consumption. The capital cost will be covered by the saving in the electricity bill. The payback period is around 7 years.

Singapore

- Singapore launched the “10% Energy Challenge” in 2008. Residents who were proven to be successful in reducing their electricity consumption by 10% within a specific period of time were eligible to enter into a lucky draw.

How to reduce 25% electricity consumption?

Table 1: Energy Saving measures:

Hardware (Technical advancement/ Energy efficiency improvement) Total Saving: 8,000 GWh	Home and Office Appliances (save 4,000 GWh) Measures: <ul style="list-style-type: none"> • 10 types of appliances to be included in the Mandatory Energy Labelling Scheme on Appliances • Raise the energy efficiency standard of all appliances from 25% to 35% by 2020, using 2005 as the base year.
	Mandatory Implementation of Building Energy Code (save 4,000 GWh) Measures: <ul style="list-style-type: none"> • At least 45% of office area in Hong Kong adopts the Building Energy Code (Approximately 4.1 million square meters of office floor area) • Doubling the energy efficiency standard of the code over next 10 years.
Software (Behavioural Change) (4,500 GWh)	Behavioural Change (Household) (save 1125 GWh) Measures: Every household in Hong Kong saves 500 kWh per year, through measures including saying 'No' to standby power, switching off unnecessary appliances, implementing more green tips and taking part in Earth Hour.
	Behavioural Change (Office) (save 3,375 GWh) Measures: Switching off office equipment and appliances after working hours, setting up individual lighting and air-conditioning zones. Applying energy-saving films to windows if at all possible. Turning off personal PC monitors during group meetings. Installing a Smart Meter to understand the source of electricity consumption and the status of usage.

5) Review the Scheme of Control in Hong Kong

Utilities in general have a financial disincentive to promote energy efficiency because under traditional rate-making, the more electricity utilities sell, the more money they make. Therefore, efficiency programs have a fundamental conflict with the utility's traditional service objective.

- In Hong Kong, under the Scheme of Control (SOC), the disposable profits of the utility companies are based on the return on their equity capital. The tariff

rates are set to allow the utilities to recover their operating and capital expenditures in supplying electricity to their customers. The permitted rates of return on capital investments are also included in the utility's total revenue.

- The cost of service in electric utilities generally tends to comprise a significant portion of capital expenditures associated with investments in power plants, including transmission and distribution systems, which is likely to be predictable in securing the utilities' future revenues. This provides the utilities with a strong incentive to maintain revenues by increasing electricity demands and upgrading their systems.
- If electricity demand is reduced through DSM measures, the need for having a new power plant can be eliminated or deferred. If this happens, revenue levels will be adversely affected. On the other hand, building new power plants will increase equity capital, which is the outcome upon which the economic returns of the utility companies are based. This will also lead to the increase of electricity tariff.
- In 2005, before the renewal of the second SOC, electricity sales were much lower than forecast, and Hong Kong Electric, which experienced a drop in profit levels, applied for an increase in the electricity tariff of 7.2%. The move provoked widespread discontent among legislative councilors. Therefore, power companies may be able to apply for an increase in electricity tariffs if the permitted level of return is not met due to the reduction in electricity sales caused by energy-saving measures.

Reviewing the Scheme of Control and including concrete Demand Side Management measures is the way forward to help Hong Kong reduce its electricity consumption. **The Government should consider:**

- *Requiring the power companies in Hong Kong to set an aggressive DSM energy-saving target and launch relevant energy-efficiency programs for every customer outside the scheme of control (SOC).*
- *Providing incentives to encourage power companies to participate in specific energy-saving scheme for the users.*
- *Revising the tariff system in a way that requires those who consume more electricity to pay a higher price. This measure can compensate for the loss of profits that power companies may experience and can reduce the burden of increased tariffs for the more energy-efficient end users.*
- *Energy poverty must be addressed when there is a significant change in the tariff structure. Special care and subsidies must be given to those in need.*

- *The existing DSM target to save 15 Gwh by two utilities is equivalent to 0.0004% of the total energy use (excluding energy export portion). This target is insignificant. However, a balance should be made between promoting energy efficiency program to the user through utilities as the related operating cost will be covered under SOC and eventually paid by taxpayer.*
- *Additional measures should be developed outside SOC to achieve a more concrete and aggressive energy saving target for users through energy utilities. The part related to energy efficiency in SOC must be seriously reviewed and revised in the 2014 interim review. The entire SOC must be reviewed before 2018 in order prepare a new energy policy roadmap for Hong Kong.*
- *The energy intensity target proposed by APEC and adopted by the Hong Kong Government has proven to be outdated as the trend of GDP growth is no longer in proportion to the growth of the energy usage in Hong Kong. As a result, the GDP growth will offset the energy consumption growth, which shows an untrue picture. The Hong Kong Government should not merely adopt the energy intensity target proposed by APEC. Instead, Hong Kong Government should adopt the actual reduction in energy and electricity as an indicator.*

6) Consultancy Report

Three scenarios are listed in the consultant report. Table 3 shows the percentage of the carbon intensity reduction of each scenario. Scenario 3 exhibits the highest reduction in carbon emissions among three scenarios.

Table 3: Carbon intensity reduction by scenarios by year

	2005 (Kg (Co2/)/HK\$)	2020 (Kg (Co2/)/HK\$)	Percentage Change
Base Case	0.0304	0.0204	-33%
Scenario I	0.0304	0.0190	-37%
Scenario II	0.0304	0.0185	-39%
Scenario III	0.0304	0.0130	-57%

The Scenario Analysis/Policy Analysis without credibility⁴

According to the consultant document: Appendix B – Mitigation Assessment, on page B-33, Section 3.1, “The AQO Study options were considered individually, rather than in combination and thus not compatible with MARKAL-MARCO (MM), which is a dynamic macroeconomic model and considers measures in an integrated manner”, the content indicates the scenarios do not pick up the combined effect (interaction between mitigation pathways) brought by the MM model.

- The MARKAL-Macro model (M-M model), an energy-economic-environmental modeling was used to develop the base case. However, the results of the most important 3 scenarios are probably not generated by the same model. That is, the results can be infeasible. Moreover, according to the properties of M-M model, the lowest cost and feasible combination of technologies to deliver the target reduction in emissions can be found by the model itself.
- Moreover, the M-M model can be used to explore how the energy system will evolve under different carbon emissions constraints, under different assumptions like future fossil fuel prices and the pace of technological innovation. The M-M model can also provide the macroeconomic implications to Hong Kong, like social costs of different scenarios. The same consultant, ERM, used the M-M model to prepare Greenhouse Gas Emission Control Study: Revised Executive Summary (Reference C1867) for Environmental Protection Department in December 2000.
- The correct approach is to let the model be constrained and deliver the Government’s goal of achieving a 60% reduction in carbon emissions by 2020. The model will then choose the cheapest combination of technologies to deliver the target reduction in emissions.

Empirical results without credibility

- The constraints used in three scenarios are not built in a logical way. The constraints in Scenario 3 should be tightened than that in Scenario 2 and 1. Stricter constraints should be used along the scenarios’ policy settings. However, scenario 3 exhibits the highest final energy demand when compared to scenario 1.
- There is no evidence to show that all three scenarios have gone through the M-M model to test its feasibility in a combined setting, which means that the

⁴ A larger part of content of this section is based on the input and discussion with Dr. William Chung, Department of Management Sciences, City University of Hong Kong. Dr. Chung is an expert in MM model and he has read the climate consultant report.

verification and analysis of the trade-offs between different mitigation pathways as well as the interaction between different parameters and variables was skipped. This puts Hong Kong in a high risk whether the proposed percentage of fuel mix can really deliver the expected reductions in carbon emissions.

- The M-M model can help to highlight what combination of technologies could deliver reductions in carbon emissions and what the costs of abatement might be.
- Since all 3 scenarios were not built by a rigorous modeling approach as mentioned above. The scenarios as a result could be deliberately manipulated in a way that the fuel mix had been predominated before the model is constructed. The major drawback of this manipulated approach is that the suggested solutions are not at least cost and may be infeasible. This approach contradicts to the objective of minimizing the cost of emissions control measures. WWF requests more scenarios should be listed out for public to consider and all the scenarios should be produced by a normal application of MM model.

Data and Forecast without credibility

- The four scenarios record a surge of final energy demand of 34.3%, 26.9%, 27.4% and 36.2% respectively. Over-projection of future demand will lead to the needs for increasing equity, which resulted in an increase in the future electricity tariff. The Scenario 3 with the most aggressive measures to cut emissions, estimated the highest final energy demand among all scenarios. (Refer to Table 3).

Table 3: Final energy demand (TJ)

Year	Base Case	Scenario 1	Scenario 2	Scenario 3
2005	294,968	294,968	294,968	294,968
2010	306,121	303,461	303,526	310,234
2015	348,700	341,273	342,814	345,533
2020	396,211	374,187	375,817	401,857
Percentage change <u>(2010-2020)</u> <u>(10 years)</u>	<u>+29.4%</u>	<u>+23.3%</u>	<u>+23.8%</u>	<u>+29.5%</u>
Percentage Change <u>(2005-2020)</u> <u>(15 years)</u>	<u>+34.3%</u>	<u>+26.9%</u>	<u>+27.4%</u>	<u>+36.2%</u>

Source: data drawn from Climate Consultancy report, Appendix B – Mitigation Assessment, page B-45

- According to the consultancy report, the annual growth of final energy is 1.99% from 2005 to 2020, which is far higher than the annual growth of 1.2% from 1995 to 2005. Given the population and GDP will keep increasing in the future, the annual growth of final energy is unreasonably high in the next 10 years with the mandatory implementation of numerous energy efficiency measures, for example, Building Energy Code and Labelling scheme of appliances. The growth rate of last 10 years is only 6.3%. (Refer to Table 4).

Table 4: Energy end-use (TJ)

Year	Final End Use	-
1993	249,616	-
1998	268,434	-
2008	285,430	-
Percentage change	<u>1998-2008</u> <u>(10 years)</u>	<u>+6.3%</u>
	<u>1993-2008</u> <u>(15 years)</u>	<u>+14.3%</u>

Source: Hong Kong Energy End-use data report, 2009, EMSD

7) Building energy conservation

The building sector is the Hong Kong's largest electricity consumer accounting for 89% of the total consumption. Improvements in energy efficiency in buildings are critical to making a significant contribution to climate change mitigation. In supplementing the BECs, based on survey of both new and existing building stock at different ages, the Government should set up a carbon/energy reduction target for the building sector. The percentage of energy saving will enable the estimation of the number of new and existing buildings that require compliance with the new legislation and retrofitting. A baseline should be established by introducing a mandatory scheme of energy and carbon audit for existing building stocks phase by phase.

- Buildings are a major source of GHG emissions. WWF supports the Government to enhance building energy efficiency standards and require developers to provide potential users with the environmental and energy consumption information of buildings. We believe such a policy is an essential step in transforming Hong Kong into a low carbon city.
- The Hong Kong Government has issued five codes of practice on energy efficiency of buildings, including one on overall thermal transfer value (OTTV) of buildings and four on major services installations in buildings. Compliance

with the OTTV code is a legal requirement to new commercial and hotel buildings. However, a review and uplifting of the OTTV standards is urgently required.

- The Legislative Council passed the bill of Building Energy Code (BEC) this year. Based on the Government's initial estimation, the bill will result in saving energy for 2.8 billion kilowatt hours in the first decade of implementation, which contributes to a reduction in carbon dioxide emissions of 1.96 million tonnes. However, the energy saving is disappointing as it only accounts for less than 1% of electricity consumed by buildings in Hong Kong, especially given the resources and effort spent on enforcement of the bill. The Professional Green Building Council (PGBC) and WWF support the implementation of the mandatory BECs, which serves as the minimum standards in achieving energy saving in building sector. In order to upgrade the standards with an aim to make continuous improvement, the standards of BECs as well as the percentage of improvement should be reviewed every three years.
- The BEC applies mainly to new buildings unless there is a major retrofitting to be done to the existing building stocks, in which case these should also comply with the requirements. With more than 40,000 buildings in Hong Kong, the major electricity consumption comes from the existing building stock. Commercial sectors accounts for more than half of the share in the consumption. Programs, such as low-carbon office operation program (LOOP – <https://loop.wwf.org.hk>) should be promoted to commercial tenants, especially as the Government's 450 million program (Building Energy Efficiency Fund) applies only to the communal area of the building. The new legislation for existing building energy standards should be established. Hong Kong should make reference to the aggressive overseas examples, such as for Singapore, which has set a target to make 80% of all existing buildings to comply with Green Mark (Building Energy Code) by 2030.
- The Building Energy Efficiency Code was developed for commercial buildings. WWF urges the Government to also introduce the Building Energy Code and related regulations for residential buildings, which account for a quarter of electricity consumption. This will also help to engage the public to start a low carbon lifestyle and enhance the job opportunities for EsCo (Energy Service Company) to upgrade the energy efficiency settings for homes.
- WWF and the Department of Management Sciences, City University of Hong Kong teamed up to study the energy efficiency of offices buildings in Hong Kong in 2010. 104 samples were collected. The study found that the energy efficiency of single-owner Grade A office buildings was the worst, with energy consumption per square meter being up to 582 kW/h per year, which is the double of that of Grade C office space. In other words, for every 10 square

meters (about 107 sq. feet) of Grade A office building with single-owner, its annual energy consumption is equivalent to a three member family's annual energy consumption.

- The survey also found that public spaces of Grade A and Grade B office buildings consume more electricity than the tenant units. WWF believes that the improvement in energy efficiency is the first priority of addressing climate change. The study clearly showed there is still a lot of room for improving the energy efficiency of office buildings. To address climate change, priority should be given to demand side management (DSM). The Government should implement greater energy efficiency measures to achieve emissions reduction targets through aggressive building energy efficiency and green building initiatives.
- In the Grade A office space with single-owners, these firms occupy the entire buildings, and hire management agents to manage their buildings. Energy efficiency may not be the main concern of the building management agents. Meanwhile, the employees in this grade office building do not have an incentive to save energy. As for Grade C, with no central air-conditioning provided and tenants paying their own utility bills, users will be more conscious to save energy. WWF's Low-carbon office operation program (LOOP) can assist the behavioral change, providing policy and guideline to engage employees' behavior.

The Government should establish a rating system on building energy efficiency and require developers to disclose carbon emissions data of buildings to the buyers. In the long run, the Government should provide incentives to stimulate the supply of buildings with higher energy efficiency performance and extend the scheme to existing building. The Energy Performance Certificate (EPC) used in the U.K. can serve as a good reference for Hong Kong.

- The EPC implemented in the U.K. is similar to the energy labels applied to vehicles and many household appliances. The certificate provides an energy rating of the building from A to G, where A is more efficient and G is the least efficient. The energy performance of the building is shown as a Carbon Dioxide (CO₂) based index. Each energy rating is based on the characteristics of the building itself and its services (such as heating and lighting). Hence this type of rating is known as an asset rating.
- All homes on sale in the UK from 2007 have the responsibility to declare an energy efficient rating to potential buyers as part of a Home Information Pack (HIP). This rating aims to compare the efficiency of one home to others of the same type. This will become an important buying feature because the operation cost of running a home continues to increase. This rating system may become a value-adding benefit of making a home more energy efficient

and making it much easier to be sold. Examples of the rating system are as follows:

The case in the UK⁵

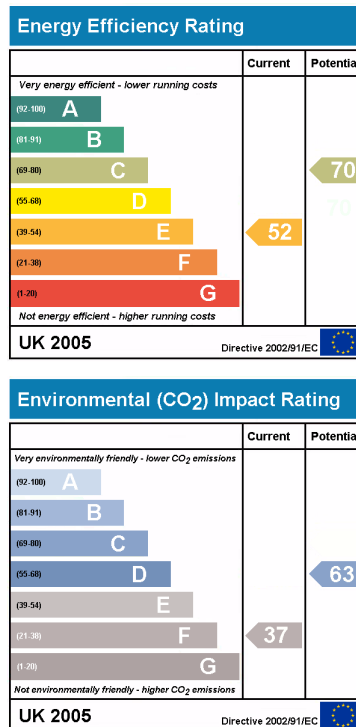


Diagram Source: http://wapedia.mobi/en/Energy_efficiency_in_British_housing

8) Low Carbon Appliances

- WWF's latest analysis shows that the difference in energy consumption between the most energy-efficient electrical appliances and that of the least ones can be as high as 32%, after comparing the models of the six major home appliances available in Hong Kong.
- If the Government strengthens the energy efficiency labelling scheme for appliances, improves the energy efficiency standards, and also extends its coverage to office appliances, Hong Kong could annually save 35% of electricity and the city's overall energy consumption could be reduced by almost 10%.
- According to the Government's latest Hong Kong's Climate Change Strategy and Action Agenda, one measure is that "the energy efficiency of all electric

⁵ Improving the energy efficiency of our buildings, A guide to energy performance certificates for the construction, sale and let of non-dwellings, 2nd edition July 2008, Department for Communities & Local Government

appliances available in the market should be increased by 25% in 2020 comparing to the 2005 level". This is well below the 32% recommended by WWF and therefore not proactive enough.

- WWF calls on the Government to raise the target to 35% instead of 25%, and include at least 10 electrical appliances in the mandatory energy efficiency labelling scheme by 2015.
- WWF launched its low carbon appliance guide in 2008 to promote the improvement in energy efficiency standards of electrical and electronic appliance.

Website: <http://www.wwf.org.hk/saveenergy>

9) Behavioral Change

The aforementioned initiatives focus mainly on the changes in infrastructure and policies that lead to a reduction in carbon emissions. However, a well-designed incentive scheme should also be introduced to individuals to encourage them to reduce their energy consumption, and hence carbon emissions. In recent years WWF has shown that education and effective program design can help to facilitate behavioral change. For example, Earth Hour has successfully engaged more than two million people in Hong Kong to switch off their lights for one hour, indicating the readiness of Hong Kong people to take action to combat climate change.

- WWF also launched the "\$3,600 Low Carbon Challenge" in 2009, calling on Hong Kong citizens to cut home energy use and reduce their carbon footprint to help tackle the issue of climate change. The initiative proved a great success, with over 3,100 Hong Kong families taking part. The five-month challenge recorded an average 23% drop in electricity use among all participating families. Winning families recorded an average 40% drop in electricity. WWF encourages all people in Hong Kong to follow their example and embark on a low-carbon lifestyle.
- Since November 2009, WWF has held activities such as workshops, field visits and seminars for uniform groups, youth groups and the public, providing them with low-carbon living tips and teaching them the science behind climate change.
- WWF-Hong Kong found that, for the participants of a training program, the average carbon emissions of the 200 Climateer Ambassadors per year per person is 9.03 tonnes, and they are able to reduce their carbon footprint in their daily lives by an average of two tonnes of carbon dioxide per year per person, through various lifestyle adjustments. This is equivalent to 23% of individual carbon emissions, higher than what participants pledged to cut, i.e. 5 % when joining the training programme.

10) Embodied carbon

- The Hong Kong Ecological Footprint Report 2010 published by WWF-Hong Kong shows that more than half of Hong Kong's carbon Footprint (as calculated by the Global Footprint Network – www.footprintnetwork.org) is attributed to embodied carbon. Embodied carbon is based on embodied energy, which is the energy used during a product's entire life cycle in order to manufacture, transport, use and dispose of the product. This concept is used in relation to trade as a way to attribute the demand for CO2 emissions to the final user.
- Embodied carbon is not covered at all in the Climate Change Strategy and Action Agenda, but should be as Hong Kong clearly has some responsibility for the environmental impacts of the goods we consume, whether or not that impact occurs within or outside Hong Kong.
- The Hong Kong Government should start to address the high proportion of the carbon Footprint emitted elsewhere to supply imports to Hong Kong, by educating the community on this new area of concern, and leading change through the introduction of procurement policies for Government favouring goods and natural resources with relatively lower embodied carbon.

11) Adaptation ⁶

With reference to the IPCC, climate adaptation can refer to an adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts⁷. The Hong Kong Observatory has confirmed that Hong Kong has been warming up, following trends consistent with global climate change⁸.

As such, while WWF considers that Hong Kong should transform to a low carbon existence, the Hong Kong Government also has a pressing responsibility to prepare for the impacts of climate change by conducting a comprehensive climate vulnerability and adaptation analysis for Hong Kong. We view that the Vulnerability and Adaption Assessment (the Assessment) together with this consultation is an important first step for formulating Hong Kong's climate adaption strategy. However, it is equally important for the Government to commit adequate resources to allow the implementation of the adaptation measures identified in the Assessment.

⁶ The comment of adaptation is prepared by cross-team effort at WWF.

⁷ Smit & Pilifosova (2001) *Adaptation to Climate Change in the Context of Sustainable Development and Equity. Climate Change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*

⁸ Leung *et al.* (2004) *Climate Change in Hong Kong. HKO Technical Notes No. 107*

WWF's views on the climate vulnerability and our recommendations on the adaptations on specific sectors in Hong Kong are as follows:

❖ **Biodiversity – General**

- WWF believes that conserving biodiversity and supporting healthy ecological environments can greatly help in increasing the resilience of our natural systems to the effects of climate change.
- As a critical measure to better preserve and enhance the integrity of our ecosystems, the Government should first review the existing policy and legislative loopholes and adopt a Convention on Biological Diversity (CBD) compliant cross-Bureau nature conservation policy.
- WWF concurs that Hong Kong biodiversity is highly vulnerable to climate change (Table 2.11), in particular to those endemic species. In addition to long-term routine monitoring on their status, WWF considers that AFCD should formulate specific species action plans to species of conservation interests, such as endemic and near-endemic species, according to the standards under the Convention on Biological Diversity.
- Each Country Park and Special Area should have its own management plan with clear conservation objectives to enhance the quality and resilience of the environment.
- The connectivity among country parks and special areas under the Country Parks Ordinance and areas of conservation zonings (e.g. Conservation Areas, Coastal Protection Areas and SSSIs) should be maintained or enhanced with the provision of wildlife corridors so as facilitate any potential shifting in species range in response to climate change.
- A detailed map showing specific intertidal and subtidal marine habitats that are vulnerable and ecologically important, such as spawning and nursery grounds, and areas of primary productivity like seagrasses, mangroves, coral communities, is a vital management tool, and should be accessible to the public. Such a baseline map can be compiled from existing data with the input of various stakeholders with interests or knowledge of the areas. Other areas that must be mapped are those with existing impacts (e.g. borrow pits), restricted areas (e.g. shipping channels). This habitat map is essential prior to the planning and establishment of network of marine parks/ protected areas for enhancing the resilience and health of the Hong Kong marine environment.
- Hong Kong is too small as a management unit to facilitate conservation of many species in the face of climate change, within its borders alone. Far greater active coordination with Guangdong Province is necessary, and networks of protected areas should be seriously considered. The Framework Agreement on Hong Kong/Guangdong Co-operation provides the necessary framework to facilitate such joint environmental actions.

❖ Biodiversity – Coral

- Information on the likely responses of Hong Kong corals to localized climate change is very limited. Stresses associated with climate change, such as high-temperature induced coral bleaching, reduced calcification due to increased seawater acidity, will affect the distribution range, growth and health of the coral communities. Corals are usually able to recover from acute physical damage if the environmental stresses (chronic stress) are weak and the acute stresses are not severe and frequent. However, if put together, the harmful effects from chronic and acute stresses, may be magnified and affect the long-term survival of the coral communities. Increases in global temperature may also increase the frequency and magnitude of El Niño-Southern Oscillation (ENSO) events. All these stresses together may cause further degradation of coral reef communities.
- Gradual increase of sea temperature may cause chronic stress in warm areas, but benefit in cooler areas such as Hong Kong. Hong Kong's coral communities are located on the marginal fringe of the great Indo-Pacific reef complex. Situated in this marginal geographical location, it is possible that Hong Kong's coral would have higher tolerance to increased water temperature.
- However, climate change may lead to increased acidity of seawater, carbonate ion decrease and hinder the process of coral skeleton formation (reduced coral calcification). In addition, more frequent rains may lead to increased runoff, which will lower the salinity of seawater and lead to coral bleaching.
- WWF considers that research into adaptation and recovery mechanisms, resilience and vulnerability, as well as long-term monitoring of coral communities in Hong Kong should be a priority and will allow us to learn more about the impacts of climate change.
- Effective networks of marine parks shall be established to mitigate the non-climate associated stress so as to maintain the diversity, health and connectivity of reef system in the region. Some types of coral communities are not protected by existing Marine Parks. It should be noted that effective coral protection will also contribute to reef fish resources conservation.

❖ Biodiversity – Mai Po and Inner Deep Bay Ramsar Site

- WWF considers that long-term population monitoring on prioritized wetland species is essential for effective management of the Mai Po and Inner Deep Bay Ramsar Site (the Ramsar Site) and its surrounding Deep Bay ecosystem. By analyzing the data from AFCD's Deep Bay Waterbird Monitoring and Baseline Monitoring Programme, it may be possible to detect changes in waterbirds migration pattern (i.e. population, diversity, assemblages and successions), as well as the invertebrates' composition on intertidal mudflat and *gei wai*. Apart from species level monitoring, it is

- also important to monitoring the key environmental attributes and the wetland habitat changes in Mai Po and Inner Deep Bay Ramsar Site, as well as the whole Deep Bay ecosystem.
- However, WWF views that our current knowledge on the possible impacts of climate change to the Ramsar Site is very limited. As such, we urge the Government to allocate more resources and funding to support research studies to better understand its climate vulnerability. WWF opines that several aspects are of particular interests, including, but not limited to:
 - the effects of climate changes on different habitats, such as the size/area of mangrove and mudflat, and the physiochemical characteristics in the fishponds, *gei wai*, and river channels;
 - the effects of climate changes on the major biotic communities (e.g. waterbirds, benthic invertebrates and freshwater invertebrates) in the systems, and their inter-relationships (e.g. the effect on the food chain);
 - the effects of climate changes on bird migratory patterns along the flyway;
 - the effects of climate changes to the problems of invasive species;
 - WWF considers active management of the Ramsar Site can help enhancing its resilience to climate change. As such, adequate funding and resources should be allocated for habitat management and invasive species control for the Mai Po Nature Reserve as well as the whole Ramsar Site. It is also expected that the operational cost (e.g. repair of infrastructure) will increase over time as a result on the increase in frequency of more extreme weather conditions (e.g. typhoons) and sea level rise and associated storm surges.
 - In order to enhance its resilience to climate change, WWF considers the Authority should increase the area of the Ramsar Site to cover the newly formed mudflats, which are serving as the foraging grounds for waterbirds.
 - Hong Kong should facilitate the establishment of a network of protected/managed wetland sites as staging/wintering site for migratory waterbirds. Given the migratory birds may change their migratory patterns, WWF consider it is important for the administrations along to flyway, including Hong Kong, to protect, create, restore and manage a network of waterbird habitats, particularly for areas suitable for breeding.

❖ **Aquaculture & Fisheries**

- Climate change will affect pond fisheries in a number ways, such as an increase in water acidity, decrease in dissolved oxygen level, more fish diseases, and saline intrusion to freshwater ponds and groundwater.
- WWF considers that adaptive management measures should be promoted in the pond fishery industries in order to adapt climate change. For instance, improvement in aeration can help to increase the dissolved oxygen (DO) level in pond waters due to the increase in water

- temperature and the sudden drop in DO after sudden heavy rainfall, which is expected to be more frequent due to climate change. Poly-culture farming with raising of the filter feeder (e.g. Big head carp) could help preventing the accumulation over-growth of plankton or algae due to increase in water temperature. Keeping optimal fish stocking density to avoid overcrowding could help reducing the risk from disease outbreak.
- Climate change may alter the diversity and abundance of fish in the sea, affecting the capture fisheries. Fishers may need to go further away to north and switch into offshore fishing in order to maintain the fish catch. The expense and carbon footprint for fishing may increase. In addition, most nearby fishing grounds are already chronically overfished, and effects from climate change will likely increase the stress on marine ecosystems.
 - The fisheries resources in Hong Kong are under great threat from overfishing, as well as habitat loss and water pollution from rampant coastal development. To date, there is no reliable and regular survey which measures and monitors fisheries resources in Hong Kong, but only the Port Surveys conducted by AFCD in collecting information on the fisheries production and fishing operations in Hong Kong waters every few years. However, these surveys are grossly inadequate to identify and quantify fisheries resources and important fisheries areas in Hong Kong. The nature of the Surveys (through fishers' interviews) and the length of time (i.e. every few years) between Surveys particularly cast serious doubts on the quality and accuracy of the fisheries information. In addition, data is needed at the species level as this is the level at which we would expect to see differing responses to environmental change.
 - In order to monitor the resilience, and adaptability of the local fisheries to climate change, large-scale and ongoing research will be required to provide long-term, up-to-date fisheries data. Such data will be invaluable for the Government to formulate conservation measures to further protect local fisheries resources and preserving the dying fishing industry in Hong Kong.

❖ **Ecological Footprint**

- In 2005, Hong Kong had an average per person Ecological Footprint of 4.4 gha, among the higher in the Asia–Pacific region and double the 2.1 gha of biocapacity available per person globally. Hong Kong had the 29th largest Ecological Footprint per person compared to countries with populations larger than 1 million people (Hong Kong Ecological Footprint Report 2008).
- Hong Kong's heavy reliance on imported natural resources is also contributing to climate change, threatening biodiversity and placing Hong Kong at risk in a more resource-constrained world. Hong Kong needs to act to:
 - reduce excessive consumption,

- greatly increase its percentage of natural resources produced sustainably
 - transform its modest agriculture, aquaculture and fisheries industries so that they produce increasing quantities of high-quality product with minimum impact to the environment.
- The consultant's report notes that "Hong Kong is vulnerable to climate change beyond its borders due to its heavy reliance on imports of water, food, and both primary energy sources and electricity." As well as reinforcing the global nature of climate change and the interconnectivity of man's impacts on our planet, this vulnerability provides additional impetus to increase efficiency and reduce wastage of the natural resources Hong Kong does import. In addition, supplies of resources harvested from well-managed forests and oceans may also prove to be more stable and resilient to climate change than those over-harvested from depleted ecosystems, as healthy ecosystems are in general likely to adapt better to changing conditions. This provides additional incentive to source sustainably.
- WWF recommends that Hong Kong should adopt Ecological Footprint as a tool to measure Hong Kong's use of natural resources and thus, a measure of sustainable development, and to reduce its vulnerability to the impacts of climate change overseas and locally.

12) Turning Hong Kong into a low carbon city

The Hong Kong Government should establish a Low Carbon City Development Council, including representatives from different professional bodies, environmental groups, and Government Bureaus and Departments covering sectors from economic, urban planning, transport to environment. The mission of the Council is to set goals, monitor the carbon footprint for the city, identify key carbon saving options, develop a tailored and appropriately resourced action plan with the support from the Government and implement the plan. This council serves as a platform to bring different parties together to discuss the solutions to develop a low carbon city, and advise and gain buy-in for its implementation. The Government needs to convene a broader opinion collection base. Hong Kong Government should consider:

- *Establishing a Low Carbon City Development Council, led by the Chief Secretary for Administration by 2011 to plan and transform Hong Kong into a low carbon city.*

Yours sincerely

A handwritten signature in black ink, appearing to read 'W. Yu', with a long horizontal stroke extending to the right.

Dr. William Yu
Head of Climate Program
WWF-Hong Kong

Encl:

- Appendix I : WWF-Arup Carbon Reduction Roadmap for Hong Kong
- Appendix II : One person One Letter petition content
- Appendix III: Letter to request for the release of consultant report and extension of consultation period
- Forms of Signatures Collected

Appendix I

WWF-Arup's Road Map to reduce carbon emissions of Hong Kong

According to the projection by the Hong Kong Government, the carbon emissions of Hong Kong will be increased to 46,000 Kilotonne (KT) by 2020 under the business as usual model.

To achieve the 25% emissions reduction target (using 1990 as base year) or 37% cut (using 2005 as base year), Hong Kong has to reduce 19,525 KT carbon emissions by 2020. (46,000KT-19,525KT= 26,475 KT)

Hong Kong can continue to have sufficient energy supply without the need for increasing nuclear supply significantly. WWF & Arup has laid down a carbon reduction roadmap to achieve the target and worked through the following measures:

Sector	Measures	Total Carbon Saving (KT)
DSM-Building Energy Code	40% Penetration of BEC in commercial building (4.1M sq meters) 45% reduction by complying the BEC 50% improved efficiency of new buildings	3,500
DSM-Appliances	75% Penetration of energy efficient appliances 35% improvement in efficiency of Appliances	1,200
DSM-Power Plants	Require the power companies in Hong Kong to set an aggressive DSM energy saving target and launch relevant energy efficiency program for customers Provide incentives to encourage power companies to participate in specific Energy Saving Scheme for users Revise the tariff system in a way that heavy consumers, who consume more electricity, should pay a higher price. The measure can compensate the profit loss of power companies and reduce the burden of increased tariff for more energy efficient end users The measures contribute to 15% of total energy consumption reduction	2,300
DSM-Behavioral (Office and Household)	Switch off office equipment and appliances after working hour, set up individual lighting and air-conditioning zone. Apply energy saving films to windows if at all possible. Turn off the personal PC Monitor during the group meeting. Install Smart Meter to understand the source of electricity consumption	1,800

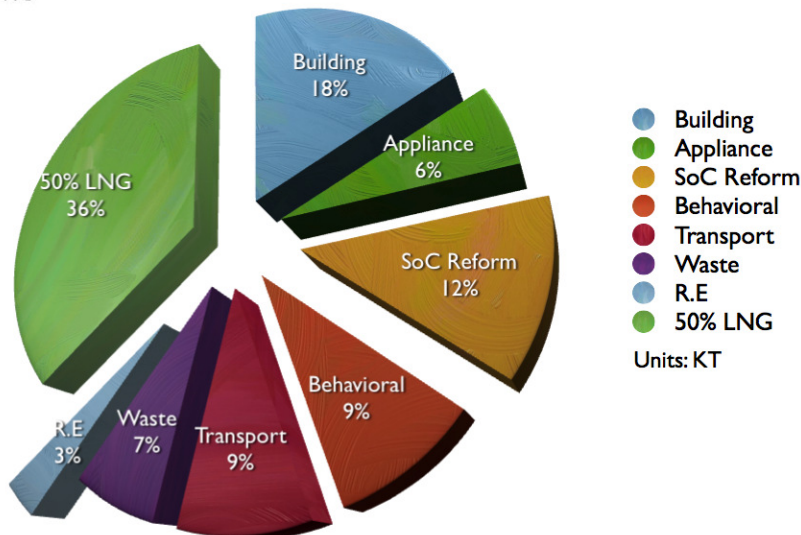
	and the status of usage Every household in Hong Kong saves 500 kWh per year, including say No to standby power, switch off unnecessary appliances, implement more green tips and take part in Earth Hour	
Transport	Fuel efficiency of private cars and buses improve 25% High penetration of Fuel efficiency cars (100%) 100%of buses GV etc Upgraded Efficiency of buses uplift by 25%	1,800
Waste	75% Methane Capture Anaerobic Digester 500tonnes/day	1,300
Renewable Energy	300MW Wind farm 0.05% of HK area covered with PV	600
Energy Mix	50% LNG +23% Nuclear	7,100
Total		19,600
	(Current trend 2020- Total carbon saving) (46,000- 19,600KT)= <u>26,400KT</u>	

- Using a pie graph to illustrate the above measures, it is easy to draw a conclusion that 60% of carbon reductions comes from Demand Side Management and 40% comes from supply side, including increasing the LNG power to 50% and some Renewable Energy.

Reducing 25% (Absolute Reduction) by 2020 (1990 base year):



Solutions to cut 25% emissions



Appendix II

One person One Letter Say no to additional nuclear

The recently announced public consultation on "Hong Kong's Climate Change Strategy and Action Agenda" has failed in a serious attempt to reduce the overall energy consumption for Hong Kong. Recklessly increasing the nuclear power in the fuel mix in order to achieve the carbon emission target proposed by the Government is instead putting the cart before the horse. According to WWF's study, Hong Kong sees no need to increase the nuclear supply, so that we can avoid the risks associated with additional nuclear power plants and unnecessary tariff increases. Please sign our petition letter to urge the Hong Kong Government to implement Demand Side Management measures, and stop increasing nuclear supply in Hong Kong. Speak up for a better climate change policy for Hong Kong before the consultation period ends in early December!

Please sign up to our petition letter to voice your complaints and demands directly to **the Environmental Bureau** to express your complaints and demands!

Mr. Edward Yau

Secretary for the Environment

The recently announced public consultation on "Hong Kong's Climate Change Strategy and Action Agenda" has failed in a serious attempt to reduce the overall energy consumption for Hong Kong following the examples set by other developed places including Singapore and Taiwan. Recklessly increasing the nuclear power in the fuel mix in order to achieve the carbon emission target proposed by the Government is instead putting the cart before the horse.

Hong Kong sees no need to increase the nuclear supply if the Government implements Demand Side Management measures aided by behavioral change to reduce electricity consumption.

I urge the Government to:

- 1) Adopt a vigorous energy conservation target for Hong Kong to reduce 25% of total electricity consumption by 2020, following other developed cities.
- 2) Provide economic incentives, such as tariff rebate, to encourage the business and residential sectors to reduce energy consumption.
- 3) Review the Scheme of Control and require the power companies in Hong Kong to implement active energy consumption reduction measures.
- 4) Say no to additional nuclear energy to avoid the risks associated with additional nuclear power plants and unnecessary tariff increases.

We believe Hong Kong should cope with climate change in the most efficient and cost effective ways following the above measures. Hong Kong has the ability and responsibility to reduce its carbon emissions without more nuclear energy, through increasing LNG supply and the implementation of measures such as green building practices, low carbon appliances, behavioral change and most importantly a reform in the electricity tariff system. Such measures can increase job opportunities and help achieve a higher target of carbon reduction.

Do not transfer the problem of nuclear to our neighbor Guangdong, and the associated risks, social injustice and environmental consequences accompanied with using nuclear energy.

We demand the Government formulate sensible public policies with the total well being of her citizens in mind and say no to additional nuclear power!

A Hong Kong citizen

Carbon Copy: Legislative Councillors

Appendix III

Letter to Secretary for the Environment – Disclosure of Climate Technical Report prepared by consultant and request for extension of the consultation period

Mr. Edward Yau Tang-wah
Secretary for the Environment

Environment Bureau
33/F, Revenue Tower,
5 Gloucester Road,
Wan Chai, Hong Kong

11 October 2010

Dear Mr. Yau,

Re: Disclosure of Quantitative Analysis of the Climate Strategy & Action Agenda

Regarding the recently launched Hong Kong Climate Strategy & Action agenda by the Hong Kong Government, we are writing to request the Environmental Protection Department to release the detailed assumptions and calculations in relation to the figures that are already shown in the consultation document within October and the full version of the consultant report prepared by the ERM within the first week of November. Similar to other Government studies, such as the one for Air Quality Objectives, we believe the calculations and relevant technical data should be made available for public inspection and discussion upon the release of the public consultation document.

The release of such information is essential for the public to evaluate the scenarios stated in the consultation document in order to arrive at the best conclusions for Hong Kong. As the three-month consultation has already begun, we demand the Government to release the said data and full report within the first week of November so as to allow sufficient time for the public to reflect their views during the consultation period. If the full consultant report cannot be made available within the first week of November, the Hong Kong Government should extend the consultation period to January, 2011 or beyond.

Thank you for your attention. We look forward to your prompt action.

Yours Sincerely,

Dr. William Yu
Head of Climate Programme
WWF – Hong Kong

Convenor: WWF-Hong Kong

Supporting Green Groups/Parties :
Hon Audrey EU Yuet-mee
Hon CHAN Hak-kan
Hon Cyd HO Sau-lan
Hon LEE Cheuk-yan

