Electrical and Mechanical Services Department

Government of the Hong Kong Special Administrative Region

Agreement No. CE 36/2000

Study on Potential Applications of Renewable Energy in Hong Kong

Frequently Asked Questions on Executive Summary of Stage 1 Study

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Q1 What is Renewable Energy? How is it defined?♣

The term "renewable energy" may be defined in several ways, and there is not at present a universally accepted definition.

In case of the European Union, for example, "renewable energy sources" are defined to mean renewable non-fossil energy sources including wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases. Biomass is in turn defined as the biodegradable fraction of products, waste and residues from agriculture, forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste. Therefore, some forms of energy from waste are included in this EU definition of RE.

For the purposes of the *Study on Potential Applications of Renewable Energy in Hong Kong*, the study has adopted the general working definition that "renewable energy sources are secure and inexhaustible, in the sense that there is no problem of reserves being depleted".

Q2 What are the energy-from-waste technologies? ♣

Generally speaking, energy may be recovered from waste (e.g., municipal solid waste) through thermal process (e.g. combustion, gasification) or biological process (e.g. anaerobic digestion, landfill gas).

Apart from the *Study on Potential Applications of Renewable Energy in Hong Kong*, the Government is examining the technology options for treating municipal solid wastes in Hong Kong. The recommended options will have impact on whether energy could be recovered from waste in the local context.

Q3 How were the renewable energy targets of 1%, 2% and 3% determined?♣

The study has adopted a "bottom up" approach in target setting. That is, we looked at what kind of and how many RE generation projects can reasonably be expected to develop within Hong Kong in the next 10 to 20 years, given various technical and non-technical constraints.

As outlined in the executive summary, the study reveals that only solar, wind, fuel cells and energy-from-waste technologies would be potentially suitable for wide scale application in Hong Kong. At the same time, it also concludes that there are many constraints to be overcome. These include not only our geographical constraints, but also many socio-economic, institutional and regulatory issues. For example, solar power is at present relatively expensive compared to conventional power generation technologies. Large wind turbines are highly visible and it is uncertain whether they would be acceptable to the public. Last but not least, for wide scale application of renewable energy technologies, the study considers that there is a need to create a market catering for the interest of both power suppliers and electricity customers. All these will take time to resolve.

♣ It should be noted that the response to this question is prepared by the consultants. As such, it does not necessarily represent Government's position.

Of course, whatever the targets should be, it is necessary for the government to review the RE targets periodically and make suitable adjustment in the future, depending on the progress in resolving the constraints.

Q4 The proposed RE targets seem low when compared with overseas (e.g., EU) countries. Please elaborate.♣

Locally available renewable energy sources in Hong Kong are limited to wind, solar and possibly energy-from-waste. Hong Kong does not have other RE sources, such as large hydro and biomass, which are the biggest contributing sources of RE in many overseas countries.

In the case of the European Union, for example, although the current target is to increase RE contribution to the total electricity generation to about 22% by 2010[1], the projected shares of wind and solar PV power to the total electricity generation are only 2.8% and 0.1%, respectively. Large hydroelectric and biomass resources, on the other hand, are predicted to contribute over 11% and 8%, respectively, of total electricity production[2].

Similar observations can also be made in the case of the USA. The US Department of Energy has predicted that by 2020, hydroelectric would contribute about 6% to the total grid-connected electricity generation. In comparison, wind and solar PV would contribute less than 1% and 0.05%, respectively[3].

In conclusion, because of difference in energy resource profiles, it would be misleading to compare the RE targets for Hong Kong directly with those for overseas economies.

Q5 The Study has found resource potentials of locally available renewable energy sources (e.g., solar and wind) to be significant. Yet, the proposed targets seem very low. Please elaborate.♣

The Study has indeed estimated that significant renewable energy (e.g., solar, wind) resources are *potentially* available in Hong Kong. However, to realise these resources to the fullest extent, it is necessary to overcome several key institutional, economic and social constraints or barriers.

Firstly, for wide scale adoption of any RE technologies in Hong Kong, it is necessary to resolve a set of complex issues such as power pricing and grid access, involving multiple stakeholders (e.g., power companies, consumers and the Government). This process is likely to take time.

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[1] Source: Directorate-General Energy and Transport, European Commission
http://www.europa.eu.int/comm/energy_transport/etif/energy_electricity/renewable.html

[2] Source: Energy for the Future: Renewable Sources of Energy, European Commission, 1997.
http://www.europa.eu.int/comm/energy/en/com599.htm

[3] Source: Energy Outlook 2002 with Projections to 2020, Energy Information Administration, Department of Energy, U.S., 2001
http://www.eia.doe.gov/analysis/2001anal01.html

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Apart from the market issues, there are also particular constraints specific to the renewable energy technologies. The high cost of solar PV systems, for example, makes them less commercially attractive. For large wind farms, given their highly visible nature, siting is an issue and it is uncertain whether their visual impact would be acceptable to the public.

In short, Hong Kong is at the beginning of renewable energy development. There are many regulatory, institutional and social issues and constraints to be overcome. The study has proposed targets that may seem modest at the moment. However, it will be up to the Government to review and adjust them in the light of feedback from the public, and periodically thereafter.