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Panel on Environmental Affairs

Meeting on 26 November 2018

**Updated background brief on promotion of renewable energy
in Hong Kong
prepared by the Legislative Council Secretariat**

Purpose

This paper provides updated background information on the promotion of renewable energy ("RE") in Hong Kong. It also gives a brief account of the views and concerns expressed by Members when related issues were discussed.

Background

Renewable energy

2. RE is energy generated from renewable resources which can be naturally replenished, such as sunlight, wind, running water and waves, and is a clean alternative to fossil fuels. RE often provides energy for electricity generation, air and water heating/cooling and transportation.

3. In Hong Kong, biogas from landfill sites and sewage treatment plants is the largest category of RE (with a share of 85%), followed by bio-diesel (12%), solar energy (2%) and others (less than 1%).¹ As biogas and bio-diesel are site-specific and cannot be produced on a distributed basis, solar power is considered to have higher development potential on the back of high solar radiation in Hong Kong.

¹ Source: Information note on "Feed-in tariff for solar power in selected places" prepared by the Research Office of the Legislative Council Secretariat published in January 2018.

Promoting adoption of renewable energy

4. Currently, the Government applies RE based on mature and commercially available technologies with the public sector taking the lead, and creates the conditions to facilitate the private sector to adopt RE. Examples of RE projects spearheaded by the Government are:

Solar power

- (a) solar farm at Siu Ho Wan Sewage Treatment Plant;
- (b) pilot floating photovoltaic ("PV") systems at Shek Pik Reservoir and Plover Cove Reservoir;

Hydropower

- (c) hydropower generation facility at Tuen Mun Water Treatment Works;
- (d) waste water-driven hydro turbine system at Stonecutters Island Sewage Treatment Works;

Waste-to-energy

- (e) sludge incineration with electricity generation at T · PARK; and
- (f) co-generation of electricity and heat by using the biogas created during waste treatment at the Organic Resources Recovery Centres ("ORRCs").

Public consultation on future fuel mix

5. The Government launched a public consultation in 2014 on future fuel mix for electricity generation ("2014 Fuel Mix Consultation").² Having regard to the public views received, the Administration plans to, apart from developing more RE, increase the percentage of local gas generation to around 50% of the total fuel mix in 2020, and, subject to a reasonable import price, to maintain the current interim measure to import 80% of the nuclear output from Daya Bay Nuclear Power Station, such that nuclear import would account for around 25% of the total fuel mix in 2020.

² For details of the 2014 Fuel Mix Consultation and its findings, please refer to the [consultation document and report](#) issued by the Environment Bureau.

Public consultation on future development of the electricity market

6. The Government further launched a public consultation on 31 March 2015 to solicit public views on the future development of the electricity market ("2015 Electricity Market Consultation").³ The consultation document set out, among other things, an analysis of the market readiness to introduce competition and the preparatory work required to pave the way to introduce competition. It also laid out the Administration's plans to implement the fuel mix for electricity generation in 2020 having regard to the views received during the 2014 Fuel Mix Consultation.

Initiatives related to renewable energy under the post-2018 Scheme of Control Agreements

7. The Government and the two power companies entered into the post-2018 Scheme of Control Agreements ("SCAs") in April 2017.⁴ In these SCAs, Feed-in Tariff ("FiT") and RE Certificates are introduced to help encourage the private sector to consider investing in RE.

8. Under the FiT Scheme, distributed electricity generated by RE systems invested by the private sector and the community can be sold at a rate higher than the normal electricity tariff rate to the power companies,⁵ whereas RE Certificates will be sold by the power companies for electricity generated from RE sources such that the buyers can claim that their operation helps reduce carbon emissions.⁶ The revenue from the sale of RE Certificates will be used to

³ For details of the 2015 Electricity Market Consultation and its findings, please refer to the [consultation document and report](#) issued by the Environment Bureau.

⁴ The regulation of the electricity market has been exercised through SCAs signed between the Government and each of the power companies (i.e. the CLP Power Hong Kong Limited and Castle Peak Power Company Limited (referred to collectively as "CLP"), and The Hongkong Electric Company, Limited ("HKE")). These agreements set out the rights and obligations of the power companies, the returns for shareholders of the power companies and the arrangements by which the Government monitors the electricity-related financial affairs of the power companies as well as their reliability and environmental performance in providing electricity. The post-2018 SCA for CLP has taken effect from October 2018 whereas the one for HKE will take effect from January 2019, both for a term lasting until end-2033.

⁵ The FiT Scheme of CLP was launched after the post-2018 SCA for CLP has taken effect from October 2018. The FiT rates at the launch of the FiT Scheme are set at (a) \$5 for $\leq 10\text{kW}$; (b) \$4 for $>10\text{kW}$ to $\leq 200\text{kW}$; and (c) \$3 for $>200\text{kW}$ to $\leq 1\text{MW}$.

⁶ CLP has announced on 28 September 2018 that the price of each unit of electricity generated by RE sources under the RE Certificates scheme is \$0.5, with RE Certificates available at a minimum purchase of 100 units. The certificates will be available to CLP customers from 1 January 2019.

alleviate the overall tariff impact of the FiT Scheme for all consumers.

Major views and concerns expressed by Members

9. Issues relating to the promotion of RE were discussed at the meetings of the Panel on Environmental Affairs ("the EA Panel") held on 23 January, 26 June and 30 October 2017, and 23 April and 19 July 2018. Related issues were also raised at the meetings of relevant bills committees and subcommittees, as well as during examination of the Estimates of Expenditures in past years. Members of the Panel on Economic Development ("the EDEV Panel") raised views and concerns in respect of the future electricity market and future fuel mix for electricity generation at the annual briefings on tariff adjustments and various its other meetings. Major views and concerns expressed by Members on related matters are summarized in the ensuing paragraphs.

Renewable energy generation target

10. Noting that the potential contribution from RE to the local electricity demand would be in the range of 3% to 4% by 2030 according to the Hong Kong's Climate Action Plan 2030+ ("the Plan"),⁷ Members considered that the Administration should set a more ambitious RE generation target. The Administration advised that issues relating to Hong Kong's realizable RE potential had been thoroughly considered when formulating the Plan, with focus of the RE generation target placed on solar power generation which was a more available and reliable RE source in Hong Kong. While RE constituted a larger proportion in the energy mix of some other jurisdictions, the majority of those places depended on other RE sources such as hydropower, the supply of which was very limited in Hong Kong.

Development of large-scale renewable energy projects

11. Members opined that the Administration should introduce initiatives dedicated specifically to generating RE on a large scale locally, such as making use of restored landfills for developing solar plants, instead of relying on waste treatment initiatives (such as ORRCs) to increase the use of RE for power generation as a secondary goal. The Administration advised that ORRCs and other waste-to-energy facilities were widely pursued in many advanced

⁷ The Plan was published by the Environment Bureau in January 2017 in collaboration with other members of the Steering Committee on Climate Change. The Plan sets out Hong Kong's new carbon emissions reduction target for 2030 and the concerted plans for meeting it.

countries to achieve the dual purposes of waste reduction and renewable power generation in one process. The Administration would also take into account the experience of the pilot floating PV systems and explore the installation of large-scale floating PV systems at suitable locations in reservoirs and PV systems at suitable landfills.

Promoting adoption of renewable energy in the private sector

12. Members asked whether and how the Administration would encourage the private sector to provide RE systems on their premises. They expressed concern that the existing regulatory requirements regarding the installation of PV systems on building rooftops were overly restrictive. They also opined that the Administration should issue guidance notes for compliance by RE developers and provide information on different PV panel models and RE system contractors for public reference.

13. The Administration advised that according to the experiences of other places, the contribution from distributed RE systems to the overall electricity demand was limited. Nevertheless, it was expected that implementation of the FiT Scheme would be conducive to the development of RE in Hong Kong by promoting public participation. The Administration would continue to explore further measures to facilitate installation of distributed RE systems in both new and existing buildings in collaboration with relevant professional bodies, such as the Hong Kong Green Building Council.

14. The Administration also advised that further support and facilitation would be provided to individuals and organizations participating in RE development, including suitably relaxing the restrictions on installation of PV systems on the rooftop of New Territories exempted houses ("NTEHs"). Subject to the fulfillment of specified conditions, the Administration would relax the height restriction to 2.5 metres in relation to installation of PV systems at the rooftop of NTEHs. Moreover, the Administration would consider making appropriate relaxations for other private buildings, in particular the low-rise ones. The Administration had also launched the Guidance Notes for Solar PV Installation at the relevant website of the Electrical and Mechanical Services Department ("EMSD") (i.e. Hong Kong Renewable Energy Net) in October 2018. The Guidance Notes covered the detailed requirements on the installation of PV systems on the rooftop of village houses.

15. As regards incentive measures to attract non-business sectors to pursue the adoption of environmental protection installations to further promote green buildings, the Administration informed Members that it would introduce a new programme in 2019 to provide financial and technical support to assist schools (except government and profit-making schools) and non-governmental welfare organizations in installing small RE systems, such as conducting site visits and

providing technical assessments, as well as installation and testing of the systems.

Feed-in Tariff Scheme and Renewable Energy Certificates

16. Some Members were concerned that the low power generation efficiency, long payback period and large space required for installation of PV systems might discourage members of the public from participating in the FiT Scheme. Members also enquired about the Administration's strategies to drive the market of RE Certificates.

17. The Administration advised that the power generation efficiency of PV systems had significantly improved in recent years. Moreover, the FiT rates to be adopted at the launch of the FiT Scheme were much higher than the prevailing electricity tariffs (depending on the generating capacities of participating RE systems), which could substantially shorten the payback periods of participating RE systems. The Administration would collaborate with green groups and encourage potential RE producers to invest in RE systems through the provision of FiT payment. On the other hand, companies could buy RE certificates sold by the power companies for units of electricity generated from RE sources (including those under FiT) so that they could claim their operation or activities carbon-free. In line with the practice adopted in many other jurisdictions, RE Certificates would be available for sale to all electricity consumers, including both corporations and individuals. To help mitigate the tariff impact, the Government would not join the FiT Scheme for its RE facilities.

18. At present individuals participating in the FiT Scheme were required to apply for a business registration and file a profits tax return under the Business Registration Ordinance (Cap. 310) and the Inland Revenue Ordinance (Cap. 112) such that profits tax might be charged on any assessable profits derived from selling units of electricity generated by the RE systems to the power companies. The Administration advised that it would introduce legislative amendments to exempt individuals from the said requirements in respect of their participation in the FiT Scheme. According to the Administration, the relevant legislative proposal would be submitted to the Legislative Council in 2019.

Safety and stability of power supply from renewable energy systems

19. Members enquired about the regulatory arrangements on the feeding of green electricity into the power grids to ensure the safety and stability of such power supply. The Administration advised that as RE systems were classified as generating facilities, the owners should ensure that the systems complied with the safety requirements in the Electricity Ordinance (Cap. 228) and its

subsidiary regulations. The systems should also comply with the reliability and power quality requirements in the Supply Rules and the case-specific technical requirements of the power companies. Besides, the power companies provided advice to customers interested in installing distributed RE systems on the technical aspects of grid connection. EMSD had also published "Technical Guidelines on Grid Connection of Small-scale Renewable Energy Power Systems" which set out the requirements in local codes and international standards on grid connection and power quality.

Development of the electricity market

20. Members expressed views and concerns in respect of future electricity market and fuel mix, including requesting the Administration to:

- (a) consider increasing interconnection of the power grids of the two power companies, and other measures to introduce competition to the electricity market (e.g. segregation of generation and transmission/distribution business of power companies);
- (b) strike a balance among the use of natural gas, coal and nuclear power for future electricity generation, and devise measures to help the power companies source fuel supplies at reasonable costs, with a view to lowering the impact of fuel cost on tariffs; and
- (c) encourage the development and wider adoption of RE.

Council questions

21. In the Sixth Legislative Council, Hon Kenneth LEUNG and Hon Kenneth LAU asked questions respectively on RE power generation installations at the Council meetings. The questions and the Administration's replies are hyperlinked in the **Appendix**.

Recent development

22. At the EA Panel meeting on 26 November 2018, the Administration will brief Panel members on a proposal to make permanent a supernumerary post at the rank of Administrative Officer Staff Grade C in the Environment Bureau to take forward tasks in relation to the promotion of RE and the long term development of the electricity market.

Relevant papers

23. A list of relevant papers is set out in the **Appendix**.

Council Business Division 1
Legislative Council Secretariat
21 November 2018

List of relevant papers

Date	Event	Paper
23 November 2015	Meeting of the Panel on Economic Development ("EDEV Panel")	Administration's paper on future development of the electricity market (LC Paper No. CB(4)217/15-16(03)) Minutes of meeting (LC Paper No. CB(4)737/15-16)
6 April 2016	Special meeting of the Finance Committee for examination of Estimates of Expenditure 2016-2017	Written questions raised by Members and Administration's replies (Reply serial numbers: ENB388 and 395)
24 November 2017	Meeting of House Committee	Report of the Subcommittee on Seventh Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences (LC Paper No. CB(1)241/17-18)
23 January 2017	Policy briefing cum meeting of Panel on Environmental Affairs ("EA Panel")	Administration's paper on "2017 Policy Address – Policy initiatives of Environment Bureau: Environmental protection" (LC Paper No. CB(1)451/16-17(01)) Minutes of meeting (LC Paper No. CB(1)683/16-17)
5 April 2017	Special meeting of the Finance Committee for examination of Estimates of Expenditure 2017-2018	Written questions raised by Members and Administration's replies (Reply serial numbers: ENB169, 179 and 281)

Date	Event	Paper
26 June 2017	Meeting of EA Panel	<p>Administration's paper on "Hong Kong's Climate Action Plan 2030+" (LC Paper No. CB(1)1164/16-17(03))</p> <p>Updated background brief on "Combating climate change" prepared by the Legislative Council Secretariat (LC Paper No. CB(1)1164/16-17(04))</p> <p>Minutes of meeting (LC Paper No. CB(1)23/17-18)</p>
30 October 2017	Policy briefing cum meeting of EA Panel	<p>Administration's paper on "2017 Policy Address – Policy initiatives of Environment Bureau: Environmental protection" (LC Paper No. CB(1)75/17-18(01))</p> <p>Minutes of meeting (LC Paper No. CB(1)399/17-18)</p> <p>Follow-up paper (LC Paper No. CB(1)589/17-18(02))</p>
12 December 2017	Meeting of the EDEV Panel (Annual tariff reviews with the two power companies)	<p>Minutes of meeting (LC Paper No. CB(4)552/17-18)</p>
22 January 2018	Meeting of EA Panel	<p>Information note on "Feed-in tariff for solar power in selected places" prepared by the Research Office of the Legislative Council Secretariat (LC Paper No. IN04/17-18)</p>
23 April 2018	Meeting of EA Panel	<p>Administration's paper on "Implementation Details concerning Renewable Energy, Energy Efficiency & Conservation and Fuel Clause Charge Adjustment Mechanism under the Post-2018 Scheme of Control Agreements" (LC Paper No. CB(1)809/17-18(03))</p> <p>Background brief on "Energy saving and renewable energy arrangements under the Scheme of Control Agreements" prepared by the Legislative Council Secretariat (LC Paper No. CB(1)809/17-18(04))</p>

Date	Event	Paper
		<p>CLP Power Hong Kong Limited's paper on "New Initiatives under the New Scheme of Control Agreement" (LC Paper No. CB(1)840/17-18(01))</p> <p>Minutes of meeting (LC Paper No. CB(1)1110/17-18)</p>
4 July 2018	Special meeting of the EDEV Panel	Minutes of meeting (LC Paper No. CB(4)1586/17-18)
22 October 2018	Policy briefing cum meeting of EA Panel	<p>Administration's paper on "2018 Policy Address - Policy initiatives of Environment Bureau: Environmental protection" (LC Paper No. CB(1)10/18-19(01))</p> <p>Administration's paper on "Guidance Notes for Solar Photovoltaic System Installation" (LC Paper No. CB(1)42/18-19(01))</p>
2 November 2018	Meeting of House Committee	Report of the Bills Committee on Inland Revenue (Amendment) (No. 5) Bill 2018 for the House Committee (LC Paper No. CB(1)114/18-19)

Hyperlinks to relevant Council Questions:

Date	Council Question
12 July 2017	Press release on Council question (oral) raised by Hon Kenneth LEUNG
25 October 2017	Press release on Council question (written) raised by Hon Kenneth LAU
31 January 2018	Press release on Council question (written) raised by Hon Kenneth LEUNG