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Panel on Environmental Affairs

Meeting on 23 April 2018

Background brief on energy saving and renewable energy arrangements under the Scheme of Control Agreements prepared by the Legislative Council Secretariat

Purpose

This paper provides background information on the energy saving and renewable energy ("RE") arrangements under the Scheme of Control Agreements ("SCAs"). It also gives a brief account of the views and concerns expressed by Members when related issues were discussed.

Background

Scheme of Control Agreements

2. Electricity in Hong Kong has all along been provided by two privately-owned 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"). The regulation of the electricity market has been exercised through SCAs signed between the Government and each of the power companies. 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 current SCAs, which were signed in 2008, will expire in 2018.[1]

[1] The SCA with CLP will expire on 30 September 2018 and that with HKE on 31 December 2018.

Existing energy saving arrangements under the Scheme of Control Agreements

3. The power companies play a role in the promotion of energy efficiency through the following:

(a) SCAs set out specific energy saving and energy audit targets for the power companies. The power companies can obtain incentives if they meet the specified annual targets of conducting energy audits for their customers, and/or if the energy saving attributable to the improvement works carried out by customers based on the energy audits conducted by the power companies meets the prescribed target levels; and

(b) following the Government's mid-term review of the current SCAs in 2013, the two power companies have each set up:

(i) a funding scheme (i.e. Energy Efficiency Fund ("EEF")) to provide subsidies on a matching basis to non-commercial building owners for carrying out energy efficiency improvement works, with priority given to single residential blocks;

(ii) a loan fund to provide loans to non-Government customers to implement energy saving initiatives identified in energy audits to promote energy efficiency; and

(iii) an education fund for organizing energy efficiency and promotion activities.

4. Apart from the funding schemes under the SCAs, the power companies have organized promotional campaigns, seminars, conferences, exhibitions and competitions to encourage their customers to save energy.[2] To help reduce tariffs and encourage energy saving, the power companies have provided energy rebates and discounts to domestic and small and medium enterprises customers with low levels of electricity consumption.

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[2] More recent initiatives include the launch of (a) on-line applications to provide instant access to information on energy efficiency to help customers to estimate their electricity consumption and recommend saving plans and tips for customers; and (b) schemes to encourage energy saving behaviour by providing online bi-monthly electricity consumption reports to help customers compare their electricity consumption with that of similar families in the neighbourhood.

Renewable energy

5. The burning of fossil fuels, such as coal, oil and natural gas, for generating electricity will increase greenhouse gases and other pollutants into the atmosphere. In contrast to fossil fuels, RE exists perpetually and in abundant quantity in the environment, and is a clean alternative to fossil fuels. Typical RE sources are sunlight, wind, running water and waves.

6. Under the SCAs, the two power companies can earn a return from their investment in RE for electricity generation. Currently, HKE operates a wind turbine on Lamma and a thin film photovoltaic system at Lamma Power Station, while CLP runs an RE power system of solar panels and wind turbines on Town Island in Sai Kung. The SCAs also contain provisions to enable owners of distributed RE power systems to connect such systems to the grid of the power company concerned.[3] According to the power companies, 50 RE power systems have been installed by the industrial and commercial sector (including power companies) and connected to the grids of CLP and HKE as at July 2017.

Public consultation on the future fuel mix for electricity generation and the future development of the electricity market

7. The Administration conducted a public consultation on the future fuel mix for electricity generation in 2014, and on the future development of the electricity market in 2015. Having regard to the views and comments received during the consultations, the Administration discussed with the power companies to draw up the regulatory arrangement for the electricity market after the expiry of the current term of SCAs. The Administration also plans to develop more RE and enhance its efforts to promote energy saving in the community.

New Scheme of Control Agreements

8. On 25 April 2017, the Administration entered into the post-2018 SCAs ("the new SCAs") with the two power companies.[4] A summary of the changes

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3 Distributed RE refers to RE generated or stored by a variety of small, decentralized and grid-connected RE devices and often located close to the load they serve, which is different from energy generated from conventional and centralized power stations and transmitted over long distances to users.

4 The duration of the new SCA with CLP is from 1 October 2018 to 31 December 2033 while that with HKE is from 1 January 2019 to 31 December 2033. The full set of the new SCAs are available on the website of the Environment Bureau at (http://www.enb.gov.hk/sites/default/files/en/node66/new_CLP_SCA_eng.pdf) and (http://www.enb.gov.hk/sites/default/files/en/node66/new_HKE_SCA_eng.pdf) respectively.

made to the current SCAs is given in **Appendix I**. Major changes relevant to the promotion of energy efficiency and conservation ("EE&C") and the development of RE in the new SCAs are highlighted below:[5]

(a) a New Eco-Building Fund/New Smart Power Fund will be set up by CLP and HKE respectively to support the carrying out of retrofitting and retro-commissioning,[6] and implementation of building-based smart/IT technologies to enhance the energy efficiency of a wider coverage of buildings;

(b) the power companies will plough back 65% of the incentives they earned from energy audits and EEFs-related work to further support other EE&C programmes, such as encouraging customers to upgrade their electrical appliances to more energy-efficient models, as well as other programmes to support green building initiatives and the use of RE;

(c) the Government will introduce the Feed-in Tariff ("FiT") under the new SCAs to encourage the private sector and the community to consider investing in distributed RE as the power generated can be sold at a rate higher than the normal electricity tariff rate to the power companies to cover the cost of their investments in the RE power systems and generation; and

(d) 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. The revenue from the sale of RE certificates will be used to 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 EE&C and RE were raised by Members at the meetings of the Panel on Environment ("EA Panel") held on 23 January, 26 June and 30 October 2017, meetings of the relevant subcommittees to study the previous Technical Memoranda for Allocation of Emission Allowances in Respect of Specified Licences, and during examination of the Estimates of Expenditures in past years. Major views and concerns

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[5] Please refer to paragraphs (3) and (4) of Appendix I for the details.

[6] Retro-commissioning is a systematic process to periodically check an existing building's energy efficiency performance. The process identifies operational improvements that can save energy and thus lower energy bills.

expressed by Members on related matters are summarized in the ensuing paragraphs.

Feed-in tariff scheme

10. Members in general urged the Administration to promote RE more proactively. They expressed concerns about the slow progress made by the Administration in taking forward FiT and stressed that the FiT rate(s) should be set at a level attractive to the public so as to encourage potential RE producers to invest in RE facilities.

11. The Administration advised that it was then discussing with the power companies the details of the FiT scheme, with a view to launching the scheme as soon as practicable after the new SCAs had come into effect. In setting the FiT rate(s), the Administration would take into account factors including the cost of investments in distributed RE power systems and generation, attractiveness of the rate(s) in providing sufficient incentives to encourage investment by the private sector and the community in distributed RE, as well as the tariff implications.

12. As regards whether any target would be set on the volume of RE generated by the private sector under the FiT scheme, the Administration advised that since the FiT scheme was new to Hong Kong, it was difficult to gauge the public's response to the scheme and the potential of such market at this stage. Instead of setting the suggested target, the Administration considered it more appropriate to provide incentives to the power companies under the new SCAs to encourage them to facilitate their customers to develop more RE.

Promotion of energy efficiency and conservation through tariff mechanism

13. There were suggestions from some Members of introducing a time-of-use tariff system (i.e. different tariff rates for different periods of the day) or a progressive tariff rate under the new SCAs to enhance energy saving by customers.

14. The Administration advised that the two power companies had already adopted progressive basis for calculating the tariffs of residential customers to encourage energy saving at present, i.e. the higher the electricity usage, the higher the electricity tariffs per unit would be. For commercial and industrial customers with high electricity consumption, their tariff structure primarily reflected the cost effectiveness of electricity supply. Apart from the energy charge based on electricity consumption, the two power companies also charged their commercial and industrial customers with high electricity consumption a

"demand charge" based on their maximum power demand, i.e. the higher the demand, the higher the "demand charge" would be.

Renewable energy certificates

15. Members sought details of Administration's strategies to drive the market of RE certificates. The Administration advised that it would collaborate with green groups and encourage potential RE producers to invest in RE power 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. Both the FiT scheme and sale of RE certificates would enhance public awareness of the need to protect the environment and in turn encourage more participation in these schemes.

Safety and stability of power supply

16. Members enquired about the regulatory arrangements on the feeding of green electricity into the power grids to ensure the safety and stability of power supply. The Administration advised that as RE power system was classified as a generating facility, 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. The Electrical and Mechanical Services Department 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.

Council questions

17. In the Sixth Legislative Council, Hon Kenneth LEUNG and Hon Kenneth LAU asked questions respectively on RE power generation installations at the Council meetings of 12 July and 25 October 2017, and 31 January 2018. The questions and the Administration's replies are hyperlinked in **Appendix II**.

Recent development

18. At the EA Panel meeting on 23 April 2018, the Administration will brief members on the energy saving and RE arrangements under the new SCAs.

Relevant papers

19. A list of relevant papers is set out in **Appendix II**.

Council Business Division 1
Legislative Council Secretariat
17 April 2018

Appendix I

Summary of the Changes to the Current Scheme of Control Agreements

(1) Duration

- About 15-year term: 1 October 2018 to 31 December 2033 for CLP; 1 January 2019 to 31 December 2033 for HEC

- To discuss with CLP and HEC of potential future changes to the electricity supply regulatory framework before January 2031

- Interim reviews every five years to consider any modifications to the new Scheme of Control Agreements (SCAs) with any changes to be mutually agreed

(2) Permitted Rate of Return (RoR)

- 8% on Average Net Fixed Assets (ANFA) with effect from 1 October 2018 and 1 January 2019 for CLP and HEC respectively

- Same RoR for renewables and non-renewables assets

(3) Promotion of Energy Efficiency and Conservation (EE&C)

- Incentives of up to 0.04% of RoR will be offered, on a pro-rata basis, for conducting 600 (or more) or 200 (or more) energy audits in a year for CLP and HEC respectively

- Incentives of up to 0.1% of RoR will be offered, on a pro-rata basis, for achieving energy saving of 48 GWh (or more) or 12 GWh (or more) in a year for CLP and HEC respectively through measures implemented pursuant to energy audits conducted by the power companies or third-party registered energy assessors where the relevant projects are directly facilitated by the power companies

- A New Eco-Building Fund / New Smart Power Fund will be set up by CLP and HEC respectively to support the carrying out of retrofitting or retro-commissioning, and implementation of building-based smart/IT technologies, or other improvement measures to be agreed with the Government. Under these funds –

- Incentives of up to 0.02% of RoR will be offered, on a pro-rata basis, for having 400 (or more) or 100 (or more) buildings with confirmed projects which have commenced in a year for CLP and HEC respectively; and

- Incentives of up to 0.1% of RoR will be offered, on a pro-rata basis, achieving energy saving of 48 GWh (or more) or 12 GWh (or more) in a year for CLP and HEC respectively through the above projects

– 65% of the incentives earned from achieving the targets in relation to energy audits, energy saving from audits and the New Eco Building Fund / New Smart Power Fund will be ploughed back by the power companies for the benefit of consumers for deployment under the new Community Energy Saving Fund (CESF) to be established by the power companies respectively. The CESF will be used to promote EE&C, such as encouraging and supporting customers (including disadvantaged customers) to replace or upgrade their electrical appliances to more energy-efficient models, as well as supporting other programmes such as green building initiatives, those to support the use of RE as well as those to support disadvantaged groups. Allocation of funds for the various programmes under the CESF is to be agreed between the Government and the power companies

– Incentives will be offered for meeting a 5-year target in respect of the energy saving achieved through the total energy saving achieved during the 5-year period on a continuing benefit basis through energy saving from audits, the New Eco Building Fund / New Smart Power Fund and the CESF –

- Incentives of 0.06% of RoR will be offered if the energy saving achieved is less than 5% but greater than or equal to 4% of the average volume of annual local electricity sales (in GWh) of the power company concerned in that 5-year period; or

- Incentives of 0.1% of RoR will be offered if the energy saving achieved is greater than or equal to 5% of the average volume of annual local electricity sales (in GWh) of the power company concerned in that 5-year period

- Loan fund of $25 million and $12.5 million per annum for CLP and HEC respectively to provide loans to their non-government customers to implement initiatives to promote EE&C

- Education fund of $10 million and $5 million per annum for CLP and HEC respectively for promotion activities in relation to EE&C

- The procedures for administering the above funds shall be subject to agreement between the Government and the power companies

- Incentives will be offered for achieving reductions in maximum demand as a result of the power companies' respective demand response programmes based on the following scale –

Adjustment of RoR	Reduction Achieved	
	CLP	HEC
0.025%	≥ 60 MW	≥ 30 MW
0.02%	≥ 50 MW but < 60 MW	≥ 25 MW but < 30 MW
0.015%	≥ 40 MW but < 50 MW	≥ 20 MW but < 25 MW
0.01%	≥ 30 MW but < 40 MW	≥ 15 MW but < 20 MW
0.005%	≥ 20 MW but < 30 MW	≥ 10 MW but < 15 MW

(4) Promotion of Renewable Energy (RE)

- Grid connection arrangements for distributed RE systems will be improved

- Measures to promote the development of RE, such as Feed-in Tariff and RE certificate schemes will be introduced

- Incentives will be offered for achieving targets on the volume of electricity generated by RE systems in the power companies' respective service area (excluding RE generated by RE systems directly owned by the Government) as a percentage of total volume of electricity generated by the respective power company in Hong Kong based on the following scale –

Adjustment of RoR	RE Generated in Service Area	
	CLP	HEC
0.05%	≥ 5%	≥ 5%
0.025%	≥ 2% but < 5%	≥ 2% but < 5%
0.02%	≥ 0.75% but < 2%	≥ 0.75% but < 2%
0.015%	≥ 0.5% but < 0.75%	≥ 0.05% but < 0.75%
0.01%	≥ 0.25% but < 0.5%	≥ 0.025% but < 0.05%

– Incentives will be offered for making new connections of RE systems to power companies' respective power grids as follows –

- Incentives of 0.00125% of RoR will be offered for making 60 to 119 new connections or 20 to 39 new connections in a year for CLP and HEC respectively; or

- Incentives of 0.0025% of RoR will be offered for at least 120 or 40 new connections in a year for CLP and HEC respectively; and

- An additional incentives of 0.0025% of RoR will be offered if at least 120 or 40 new connections generate RE regularly for CLP and HEC respectively in a year; and

- Additional incentives of 0.01% of RoR will be offered for each 5-year period if more than 750 or 250 new connections generate RE regularly for CLP and HEC respectively in the 5-year period.

– Incentives equivalent to 10% of the sales revenue from RE certificates will be offered to the power companies

(5) Incentive/Penalty Schemes in relation to Operational Performance

– The incentive/penalty levels and thresholds in relation to supply reliability are as follows –

Adjustment of RoR	Average Service Availability Index (ASAI) Target
+0.015%	ASAI ≥ 99.9960%
+0.01%	99.9960% > ASAI ≥ 99.9950%
0%	99.9950% > ASAI > 99.9930%
-0.01%	99.9930% ≥ ASAI > 99.9920%
-0.015%	ASAI ≤ 99.9920%

– The incentive/penalty levels and thresholds in relation to operational efficiency, measured in Connection and Supply Performance Index (CSPI), are as follows –

- Incentive of 0.01% of RoR for CSPI at 100%
- Penalty of 0.01% for CSPI ≤ 99.98%

– The incentive/penalty levels and thresholds in relation to customer services are as follows –

Adjustment of RoR	**Appointment Punctuality Index (API) Target**
+0.01%	API ≥ 99.8%
+0.005%	99.8% > API ≥ 99.7%
0%	99.7% > API > 98%
-0.005%	98% ≥ API > 97.9%
-0.01%	API ≤ 97.9%

– The incentive/penalty levels and thresholds in relation to grid supply restoration are as follows –

Adjustment of RoR	**Average Grid Supply Restoration Time (Average GSRT) Target**
+0.015%	Average GSRT ≤ 65 minutes
+0.01%	65 minutes < Average GSRT ≤ 70 minutes
0%	70 minutes < Average GSRT ≤ 80 minutes
-0.01%	80 minutes < Average GSRT ≤ 85 minutes
-0.015%	Average GSRT > 85 minutes

(6) Fuel Costs

– A more frequent Fuel Clause Charge adjustment mechanism will be introduced such that actual fuel costs borne by power companies will be reflected in tariffs in a more timely manner

(7) Market Development

– Power companies are required to co-operate with the Government in (a) a study of potential access to the electricity grid by third parties; and (b) a study to consider the detailed arrangements for strengthening the interconnection between the Mainland and Hong Kong, as well as that between the existing grids in Hong Kong

- Power companies are required to publish segregated cost data pertaining to their generation and non-generation systems

(8) Mechanism for Treatment of Excess Generating Capacity

- Deduction from ANFA for excess capacity will be increased from 50% to 100% of the net asset value of the mechanical and electrical equipment

(9) Emission Performance Linkage Mechanism (EPLM)

- Removal of the EPLM, whereby incentives are offered or penalties imposed on the power companies in respect of their performance in emission reduction, for the new SCA with HEC (EPLM in the current SCA with CLP was removed as a result of the Mid-term Review in 2013)

(10) Cap on Interest on Long-term Borrowings

- Cap on interest deduction from the permitted RoR on long-term borrowings (i.e. borrowings arranged for financing of fixed assets as well as customers' deposits) will be reduced to 7%

(11) Transparency

- Enhancement of transparency on the power companies' operational and financial information by releasing such information in a more structured manner through compilation of an electronic information booklet for public disclosure

[Source: Annex to LC Paper No. CB(4)925/16-17(01)]

Appendix II

Energy saving and renewable energy arrangements under the Scheme of Control Agreements

List of relevant papers

Date	Event	Paper
4 December 2015	Meeting of House Committee	Report of the Subcommittee on Fifth Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences (LC Paper No. CB(1)238/15-16)
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
29 April 2017	Joint meeting of Panel on Economic Development and EA Panel	Administration's paper on "New Scheme of Control Agreements with the two power companies" (LC Paper No. CB(4)925/16-17(01)) Minutes of meeting (LC Paper No. CB(4)1387/16-17)
26 June 2017	Meeting of EA Panel	Administration's paper on "Hong Kong's Climate Action Plan 2030+" (LC Paper No. CB(1)1164/16-17(03)) Minutes of meeting (LC Paper No. CB(1)23/17-18)
30 October 2017	Policy briefing cum meeting of EA Panel	Administration's paper on "2017 Policy Address – Policy initiatives of Environment Bureau: Environmental protection" (LC Paper No. CB(1)75/17-18(01)) Minutes of meeting (LC Paper No. CB(1)399/17-18) Follow-up paper (LC Paper No. CB(1)589/17-18(02))

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

Hyperlink to relevant document:

Date	Document
24 April 2017	Government's press release on "New Scheme of Control Agreements reached with the two power companies"