

**LEGISLATIVE COUNCIL BRIEF**

**2018-23 DEVELOPMENT PLANS  
AND 2019 TARIFF REVIEW  
OF THE TWO POWER COMPANIES**

**INTRODUCTION**

At the meeting of the Executive Council on 3 July 2018, the Council ADVISED and the Chief Executive ORDERED that the 2018-23 Development Plans (“new DPs”)<sup>1</sup> proposed by the two power companies, viz., CLP Power Hong Kong Limited (“CLP Power”) and Castle Peak Power Company Limited (“CAPCO”)<sup>2</sup> (hereinafter referred to collectively as CLP) as well as The Hongkong Electric Company, Limited (“HKE”) (CLP and HKE are collectively referred to as the “power companies”), which include the following features, should be approved pursuant to the respective new Scheme of Control Agreements (“new SCAs”) signed in April 2017 –

(a) In respect of CLP –

- (i) there will be capital projects for a total estimated capital expenditure (“CAPEX”) of \$52.9 billion to be incurred during the period from 1 October 2018 to 31 December 2023 (“new CLP DP Period”);
- (ii) there will be a decrease in average Basic Tariff Rate by 3.5¢/kWh, or 3.7%, to 91¢/kWh during the period from 1 October 2018 to end 2019; and

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<sup>1</sup> CLP’s new DP covers the period from 1 October 2018 to 31 December 2023 while HKE’s new DP covers the period from 1 January 2019 to 31 December 2023.

<sup>2</sup> CAPCO is a power generating company jointly owned by CLP Power (70%) and China Southern Power Grid International (HK) Co., Limited (30%), a wholly-owned subsidiary of China Southern Power Grid Co., Limited.

- (iii) the projected levels of Basic Tariff Rate for the new CLP DP Period will increase on average by 1.4% per annum; and
- (b) in respect of HKE –
- (i) there will be capital projects for a total estimated CAPEX of \$26.6 billion to be incurred during the period from 1 January 2019 to 31 December 2023 (“new HKE DP Period”);
  - (ii) there will be a decrease in average Basic Tariff Rate by 7.8¢/kWh, or 7.1%, to 101.3¢/kWh for the first year from 1 January 2019; and
  - (iii) the projected levels of Basic Tariff Rate for the new HKE DP Period will increase on average by 1.2% per annum.

## JUSTIFICATIONS

2. CLP’s and HKE’s current DPs<sup>3</sup> were approved in December 2013, and will expire on 30 September 2018 and 31 December 2018 respectively. The Government entered into the new SCAs with the two power companies in April 2017. The new SCAs are the greenest SCAs ever offering key features on promoting energy efficiency and conservation (“EE&C”) and renewable energy. These key features include the introduction of feed-in tariffs, expansion of the EE&C programmes to enhance the energy efficiency of a wider coverage of buildings, implementation of demand response programme, etc.. These will not only contribute to our efforts to meet our carbon intensity reduction target for 2030 but also our energy intensity reduction target for 2025 to combat climate change<sup>4</sup>. Pursuant to the new SCAs, the power companies submitted their new DPs to tie in with the expiry of the respective current DPs. The new DPs include essential capital projects to change the fuel mix for electricity generation which will help combat climate change and further improve our air quality, ensure the reliability and security of our local electricity supply, and assist in turning Hong Kong into a smart city.

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<sup>3</sup> CLP’s current DP covers the period from 1 January 2014 to 30 September 2018 (expiry of the current CLP SCA), and HKE’s from 1 January 2014 to 31 December 2018 (expiry of the current HKE SCA).

<sup>4</sup> We have pledged to reduce carbon intensity by 65% to 70% by 2030 compared with 2005 and to achieve energy intensity reduction by 40% by 2025 using 2005 as the base.

3. To support the EE&C initiatives under the new SCAs, both power companies will replace their electromechanical meters by smart meters with backend facilities. The project will help energy saving and turn Hong Kong into a smart city. Unlike in the past 20 years when there have been no plant replacements by both power companies, about 10 coal-fired generating units (“coal units”) of the power companies will reach their scheduled retirement life between 2020 and 2030. To ensure a stable and reliable electricity supply, there is a need to replace these coal units. As electricity generation accounts for about 70% of Hong Kong’s carbon emission, the main vehicle to achieve our carbon intensity reduction target will be phasing down coal-fired electricity generation in the coming decade and replacing them with natural-gas and non-fossil fuel sources. For the new DP Period, the power companies will construct four new gas-fired generating units (“gas units”)<sup>5</sup> to replace five coal units scheduled for retirement. CLP and HKE will jointly build an offshore liquefied natural gas (“LNG”) terminal in Hong Kong waters to enhance their gas supply security at competitive prices. CLP will also enhance the clean energy transmission network to provide more flexibility for generation planning and fuel mix adjustment as well as for accelerating the achievement of carbon intensity reduction target set for 2030.

## **KEY FEATURES AND ASSESSMENT**

4. In considering the new DP proposals, we are mindful that they must be conducive to achieving the Government’s four overarching energy policy objectives, i.e. safety and reliability of electricity supply, affordability and environmental performance. With the assistance of an independent energy consultant, we have examined the power companies’ maximum demand and load forecasts underlying the new DPs and considered that the power companies’ maximum demand and load forecasts are reasonable. We have also critically reviewed the capital projects proposed by the power companies on the project need, timing and budget, with assistance from the independent energy consultant. The assessment has concluded that the power companies’ capital project proposals are justified with reasonable costs. These capital projects will be monitored and adjusted in the light of actual demand build-up through the annual Auditing Review and Tariff Review

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<sup>5</sup> In order to achieve the target of increasing the ratio of local gas-fired electricity generation to about 50% of the total fuel mix by 2020, two of the new gas units projects have been approved during the current DP period.

under the new SCAs.

## I. Load and Sales Forecast

5. CLP projects that both the local maximum demand and local electricity sales will grow at an average annual rate of 0.5% for 2019 to 2023. As for HKE, it projects its local maximum demand to decline at an average annual rate of 1.7% for 2019 to 2023 and its local electricity sales to decline at an average annual rate of 1.0% owing to the lack of development growth in its supply area and impacts from community-wide EE&C initiatives.

## II. Capital Projects

6. The total estimated CAPEX for the new DP Period proposed by CLP and HKE is as follows –

<u>Project Type</u>	<u>CLP</u> <u>(\$ billion)</u>	<u>HKE</u> <u>(\$ billion)</u>
(A) Generation System	25.4	16.2
(B) Transmission and Distribution System	26.5	9.1
(C) Customer and Corporate Services Development	<u>1.0</u>	<u>1.3</u>
	<u>52.9</u>	<u>26.6</u>

7. The major capital project proposals of the power companies are as follows –

### CLP Projects

#### *(A) Development of Advanced Metering Infrastructure (“AMI”)*

8. CLP will replace its electromechanical meters by smart meters with backend facilities under a seven-year programme to be completed by 2025. This will help energy saving by providing instant power consumption information to customers, and achieve operational cost savings through remote meter reading and implementation of demand response schemes. The project will help turn Hong Kong into a smart city and enable consumers to reduce their electricity bills through energy saving.

***(B) Construction of an Offshore LNG Terminal (or the Floating Storage Regasification Unit (“FSRU”))***

9. With the increasing use of natural gas for power generation, CLP and HKE have planned to jointly build an offshore LNG terminal for commissioning in 2021. At present, CLP and HKE only have two and one gas pipeline(s) respectively. The project is very important to provide a long term alternative gas supply source to meet the fuel supply needs of the power companies and enhance the diversity and security of our gas supply. It will also enable the power companies to have direct access to the international LNG market, thus strengthening their power in negotiating competitive gas pricing and help reduce the tariff pressure.

***(C) Enhancement of Clean Energy Transmission System (“CETS”)***

10. CLP will enhance the CETS network with China Southern Power Grid and Daya Bay Nuclear Power Station. When completed in 2025, the strengthened network will give us the flexibility to use more zero-carbon energy to manage our local fuel mix, thereby enabling us to significantly advance our achievement of carbon intensity reduction target for 2030 (i.e. reduction of carbon intensity by 65% to 70% as compared to the level in the base year of 2005) by as much as five years. In addition, the CETS will delay the plans for and/or reduce the capital investment on new gas units to replace the coal units which are due to retire in 2025 and beyond. Possible options of utilising more zero carbon energy will be covered by the Public Engagement exercise on Long-term Decarbonization Strategy to be conducted by the Council for Sustainable Development at the end of 2018.

***(D) Construction of a New Gas Unit (“D2”) at Black Point Power Station (“BPPS”)***

11. CLP will construct a new gas unit “D2” (550MW) in BPPS for commissioning in end 2022 to replenish the capacity of two coal units (350MW each) to be retired in 2022 and 2023 respectively.

12. In addition to the above projects, other major new projects in the new CLP DP are to –

- (a) extend the useful lives of all coal units (equipped with advanced emission control facilities) at Castle Peak B Power Station (“CPB”), gas units at BPPS and back-up oil-fired units at Penny’s Bay Power Station for 5 years –

The useful life extension arrangement would help defer the need to construct additional gas units. The useful life extension of the CPB coal units will not compromise the environmental benefits because these units are equipped with advanced emission control facilities and will have limited generation output when we rely more on gas units for electricity generation;

- (b) replace five gas units at BPPS with new combustion systems to bring about better air quality and improved reliability; and
- (c) carry out other transmission and distribution (T&D) projects including new substations, additional circuits, improved control equipment, improvement and reinforcement of existing system to ensure that adequate T&D facilities will be in place to meet new demands from residential and commercial/industrial sectors and infrastructure development, maintain reliability of supply and safety of CLP's systems

**HKE Projects (in addition to the FSRU joint project with CLP)**

***(A) Development of AMI***

13. Similar to CLP, HKE will also implement the AMI project under the same seven-year programme, bringing about benefits as described in paragraph 8 above.

***(B) Construction of a New Gas Unit ("L12") at Lamma Power Station ("LPS")***

14. HKE will construct a new gas unit "L12" (380MW) in LPS for commissioning in early 2023 to replenish the capacity of three coal units (total 950MW) to be retired in 2022 and 2023.

15. Other major new projects in the new HKE DP are to –

- (a) carry out a re-provision project for replacing four aged oil-fired open cycle generating units by three oil-fired open cycle generating units "GT8", "GT9" and "GT10" for commissioning in 2024, 2025 and 2026 respectively. These four aged oil-fired open cycle generating units which will have been in operation for over 50 years by 2020s are scheduled to retire in 2022, 2024, 2025 and 2026 respectively.

HKE proposes to construct three new oil-fired open cycle generating units to replenish the capacity of these retired units. These units are mainly used for meeting the peak demand; and

- (b) carry out other T&D projects including the construction of new substations, additional circuits, improvement and reinforcement of existing system to ensure that adequate transmission and distribution facilities will be in place to meet demand, maintain reliability of supply and safety of HKE's systems.

### **III. Electricity Tariff**

#### **2018-19 Electricity Tariffs**

16. The electricity charge paid by Hong Kong electricity users has two major components, namely the Basic Tariff Rate and the Fuel Clause Charge (collectively, Net Tariff Rate). The new average tariff rates on commencement of the new SCAs have been approved as part of the power companies' new DPs. CLP's new tariff adjustment covers 15 months from 1 October 2018 to 31 December 2019 whereas that of HKE covers 12 months from 1 January 2019 to 31 December 2019.

17. The Net Tariff Rate of any particular year may be reduced if power companies offer special rebates, like the large special rent and rates ("R&R") rebate and fuel rebate totalling 20 ¢/kWh offered by HKE in 2018 (i.e. about 15% of the net tariff in 2018). These special rebates are however ad hoc in nature and are unlikely to emerge on a regular basis. Hence, when we consider the tariff trend over a longer term such as that in a DP, it is more appropriate to consider the average Net Tariff Rate at the level of before special rebates.

18. Both the power companies will reduce their Basic Tariff Rates (CLP by 3.7% and HKE by 7.1%) as a result of the reduction in the permitted rate of return (i.e. 1.99%) on commencement of the new SCAs. However, as oil price has increased by almost 40% since signing of the SCAs in April 2017, CLP's average Net Tariff Rate on 1 October 2018 will increase by 2% to 118.8 ¢/kWh (before rebate) and to 117.7 ¢/kWh (after rebate). For HKE, its average Net Tariff Rate (before rebates) will be reduced by 5.9% to 124.7 ¢/kWh and its Net Tariff Rate after rebate will be 120.1 ¢/kWh on 1 January 2019 owing to the significant reduction of HKE's special R&R and fuel rebates in 2019.

### 2020 to 2023 Projected Electricity Tariffs

19. The projected electricity tariffs for 2020 to 2023 are only projections and the actual tariffs to be charged to consumers each year will be determined in the respective annual Tariff Review having regard to various factors, particularly the actual fuel costs prevailing at the time. The average Basic Tariff Rate during the entire new DP Period is projected to increase at an annual rate of 1.4% for CLP and 1.2% for HKE while the average Net Tariff Rate (before rebates) is projected to increase at an annual rate of 3.5% for CLP and 2.8% for HKE. Details of the 2018-19 electricity tariffs and the projected electricity tariffs from 2020 to 2023 are set out in **Annex A1** (for CLP) and **Annex A2** (for HKE).

#### **IV. Electricity Charges Relief**

20. While the increasing use of natural gas and necessary capital investments will help bring earlier and better environmental benefits to Hong Kong, they will inevitably lead to considerable rise in electricity tariff during the new DP Period. To alleviate the impact of tariff increase on households during this transitional period in moving to a lower carbon future, we propose to grant an electricity charges relief of maximum \$3,000 to each residential electricity account. While the actual electricity tariff is likely to be different from the current projected figure owing to various factors (e.g. actual fuel cost) over the new DP Period, the one-off relief level will not be changed regardless of the actual future tariff level.

21. The proposed electricity charges relief scheme is similar to the Electricity Charge Subsidy Scheme (“ECSS”) introduced in 2008, 2011, 2012 and 2013<sup>6</sup>. Instead of providing the relief within one year like the ECSS, we recommend distributing the total relief of \$3,000 over 60 months (i.e. \$50 per

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<sup>6</sup> In order to help ease inflationary pressure through relief measures to reduce the burden on domestic households, Government started ECSS from 2008. In the latest round of ECSS in 2013, the annual subsidy was \$1,800 (or \$150 per month). The Government credited the actual billed electricity charges (subject to a monthly cap of \$150) to each residential account of the power companies for 12 months. The credit can only be used for the purpose of offsetting billed charges for electricity consumed under the same account. Any unused credit in a month can be carried forward to cover billed electricity charges under the same account up to the expiry date of the scheme (i.e. 30 June 2020), or the closure of the account, whichever is earlier.



month) commencing from the start of the respective new SCAs<sup>7</sup>. The relief can only be used for the purpose of offsetting billed charges for electricity consumed under the same account and will reduce the amount demanded in the electricity bills issued by the power companies to residential customers. Any unused credit in the month can be carried forward to cover billed electricity charges under the same account up to the expiry date of the new DPs, i.e. 31 December 2023. We will review the need to extend the expiry date of any unused credit as and when necessary.

22. Based on the power companies' projected average Net Tariff Rates (after rebates) during the new DP Period, the electricity charges relief is expected to roughly cover the projected cumulative tariff increase over the new DP Period for about half of the residential accounts in Hong Kong. However, depending on the fuel costs at the time, the actual tariff level may be higher or lower. The Government's proposed electricity charges relief is a fixed amount. If the actual electricity charges are lower than expected in the future, the Government will not reduce the amount of the relief, and vice versa.

## **IMPLICATIONS OF THE PROPOSAL**

### **Environmental Implications**

23. The power companies DP proposals will help reduce Hong Kong's carbon intensity to close to 65% by 2025 as compared to 2005 if the power from the transmission system is increased by 2% from 25% to 27% in 2025. In addition, air pollutants emission (i.e. sulphur dioxide, nitrogen oxides and respirable suspended particulates) will be reduced by 88%, 66% and 68% respectively by 2025 as compared to 2010 actual emission from power sector<sup>8</sup>. It will help further improve Hong Kong's air quality, and alleviate visibility, smog as well as acid rain problems affecting the Pearl River Delta Region.

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<sup>7</sup> The distribution period of the relief for CLP is from 1 October 2018 to 30 September 2023 while that for HKE is from 1 January 2019 to 31 December 2023.

<sup>8</sup> The "First Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences" (First TM) on air pollutant emission allowances for power stations set out emission caps for power sector since 2010. There have been seven Technical Memoranda since the launch of the First TM, with the "Seventh Technical Memorandum for Allocation of Emission Allowances in Respect of Specified Licences" (Seventh TM) being the latest that stipulates the emission caps for power sector from 2022 and onwards.

## **Sustainability Implications**

24. The power companies' proposals should contribute positively to the development of Hong Kong by ensuring the continued delivery to consumers of reliable, safe and efficient electricity supply. Their proposals also include construction of new gas units, which aim to reduce the use of coal in electricity generation. The timely implementation of these works that enable the use of cleaner fuel in power generation, should contribute positively to improving air quality in Hong Kong and the Pearl River Delta Region. Furthermore, CLP plans to source an appropriate profile of zero-carbon energy from the Mainland through the proposed CETS project. This would give Hong Kong more flexibility to adjust its fuel mix and hence to manage fuel cost.

## **PUBLICITY**

25. A press release announcing the Executive Council's decision has been issued. A joint press conference with CLP and HKE has also been arranged to announce the new DPs and the electricity charges relief.

## **WAY FORWARD**

26. We plan to submit the proposal on electricity charges relief to the Finance Committee for funding approval before the summer recess.

## **ENQUIRIES**

27. Any enquiry on this brief should be addressed to Ms Esther Wang, Principal Assistant Secretary for the Environment (Financial Monitoring), at 3509 8638.

**Environment Bureau**  
**3 July 2018**

**CLP**  
**Projected Tariff Rates,**  
**Year End Balances of Tariff Stabilisation Fund and**  
**Fuel Clause Recovery Account**

(¢/kWh)	2018a* Existing Rates	2018b# Rates	2019 Rates	Projected Rates in the 2018-23 Development Plan			
				2020	2021	2022	2023
<b><u>Tariff Components</u></b>							
Average Basic Tariff Rate	94.5	<b>91.0</b>	<b>91.0</b>	93.4	96.5	99.1	101.9
Fuel Clause Charge	22.0	<b>27.8</b>	<b>27.8</b>	32.4	36.2	37.4	37.4
Average Net Tariff Rate Before Special Rebate	116.5	<b>118.8</b>	<b>118.8</b>	125.8	132.7	136.5	139.3
Special Rent and Rates Rebate	-1.1	<b>-1.1</b>	-	-	-	-	-
Average Net Tariff Rate After Special Rebate	<u>115.4</u>	<u><b>117.7</b></u>	<u><b>118.8</b></u>	<u>125.8</u>	<u>132.7</u>	<u>136.5</u>	<u>139.3</u>
Change in							
- Average Basic Tariff Rate		<b>-3.5</b> (-3.7%)	- (0%)	+2.4 (+2.6%)	+3.1 (+3.3%)	+2.6 (+2.7%)	+2.8 (+2.8%)
- Average Net Tariff Rate Before Special Rebate		<b>+2.3</b> (+2.0%)	- (0%)	+7.0 (+5.9%)	+6.9 (+5.5%)	+3.8 (+2.9%)	+2.8 (+2.1%)
- Average Net tariff Rate After Special Rebate		<b>+2.3</b> (+2.0%)	<b>+1.1</b> (+0.9%)	+7.0 (+5.9%)	+6.9 (+5.5%)	+3.8 (+2.9%)	+2.8 (+2.1%)

\* Figures for 2018a cover the nine-month period ending 30 September 2018 before the new SCA becomes effective.

# Figures for 2018b cover the three-month period ending 31 December 2018 after the new SCA becomes effective.

**Average annual increase – October 2018 to December 2023**

Basic Tariff Rate	1.4%
Net Tariff Rate Before Special Rebate	3.5%
Net Tariff Rate After Special Rebate	3.7%

		Projected Balances in the 2018-23 Development Plan					
	2018a*	2018b <sup>#</sup>	2019	2020	2021	2022	2023
<u>Year End Balance</u>							
Tariff Stabilisation Fund (\$Million)	827	636	452	462	455	438	423
- % of Local Sales of Electricity	2.0%	1.6%	1.1%	1.1%	1.0%	1.0%	0.9%
Fuel Clause Recovery Account (\$Million)	1,018	693	394	(767)	(614)	7	24

**HKE**  
**Projected Tariff Rates,**  
**Year End Balances of Tariff Stabilisation Fund and**  
**Fuel Clause Recovery Account**

	2018 Existing Rates	2019 Rates	Projected Rates in the 2019-23 Development Plan			
			2020	2021	2022	2023
(¢/kWh)						
<b><u>Tariff Components</u></b>						
Average Basic Tariff Rate	109.1	<b>101.3</b>	105.3	110.2	114.8	115.7
Fuel Clause Charge	<u>23.4</u>	<u>23.4</u>	<u>25.8</u>	<u>27.5</u>	<u>29.8</u>	<u>36.2</u>
Average Net Tariff Rate Before Special Rebates	132.5	<b>124.7</b>	131.1	137.7	144.6	151.9
Special Rent and Rates Rebate	-4.0	<b>-2.3</b>	-0.3	-	-	-
Special Fuel Rebate	<u>-16.0</u>	<u>-2.3</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Average Net Tariff Rate After Special Rebates	<u>112.5</u>	<u><b>120.1</b></u>	<u>130.8</u>	<u>137.7</u>	<u>144.6</u>	<u>151.9</u>
Change in						
- Average Basic Tariff Rate		<b>-7.8</b> (-7.1%)	+4.0 (+3.9%)	+4.9 (+4.7%)	+4.6 (+4.2%)	+0.9 (+0.8%)
- Average Net Tariff Rate Before Special Rebates		<b>-7.8</b> (-5.9%)	+6.4 (+5.1%)	+6.6 (+5.0%)	+6.9 (+5.0%)	+7.3 (+5.0%)
- Average Net Tariff Rate After Special Rebates		<b>+7.6</b> (+6.8%)	+10.7 (+8.9%)	+6.9 (+5.3%)	+6.9 (+5.0%)	+7.3 (+5.0%)

Average annual increase – 2019 to 2023

Basic Tariff Rate	1.2%
Net Tariff Rate Before Special Rebates	2.8%
Net Tariff Rate After Special Rebates	6.2%

		Projected Balances in the 2019-23 Development Plan				
	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>
<u>Year End Balance</u>						
Tariff Stabilisation Fund (\$Million)	331	329	327	326	325	269
- % of Sales of Electricity	2.4%	2.5%	2.4%	2.3%	2.2%	1.7%
Fuel Clause Recovery Account (\$Million)	979	615	413	330	289	39