For Information
on 25 July 2005

LEGISLATIVE COUNCIL PANEL ON ECONOMIC SERVICES

THE HONGKONG ELECTRIC COMPANY LIMITED
2004 TO 2008 FINANCIAL PLAN

Introduction

This paper informs Members that the Executive Council has advised and the Chief Executive has ordered at the meeting on 28 June 2005 that 2004 to 2008 Financial Plan of Hongkong Electric Company Limited (HEC) should be approved.

Background

General

2. HEC supplies electricity to Hong Kong Island, Ap Lei Chau and Lamma Island. HEC's existing installed generating capacity is 3,412MW.

3. The Scheme of Control Agreement (SCA) provides, among other things, that

(a) a Financial Plan shall be prepared six months before the period covered by the previous Financial Plan expires;

(b) a Financial Review shall be conducted jointly by Government and HEC and that the Financial Plan shall be subject to approval by the Executive Council; and

(c) an annual Auditing Review shall be conducted to review jointly with HEC, the financial performance of HEC against the agreed estimates in the Financial Plan as well as its technical performance.

The 2004 to 2008 Financial Plan

4. HEC's approved Financial Plan for 1999 to 2004 expired in end-December 2004. HEC submitted its Financial Plan covering the period from January 2004 to December 2008 in mid-2004, which details, inter alia, HEC's electricity demand forecasts, development plans, estimated expenditure and proposed tariff rates for each year up to 2008.

5. Review of the 2004 to 2008 Financial Plan was in progress when the 2005 Tariff Review was conducted in end-2004. Members were informed in December 2004 that HEC would increase its net electricity tariff for 2005 by 6.5% before the approval of the 2004 to 2008 Financial Plan, an arrangement consistent with the provisions in the SCA.

6. With the assistance of an independent expert consultant, Nexant Inc. (Nexant)[1], we have reviewed the economic, technical and environmental aspects of the Financial Plan with HEC as part of the Financial Review as referred in paragraph 3(b) above. The review involved protracted discussions with HEC. Taking into account our comments, HEC submitted its revised 2004 to 2008 Financial Plan in end May 2005.

Salient Features and Assessment

I. Load Forecast

7. HEC's maximum demand forecasts for determining the timing for additional generation capacity and sales forecasts for tariff planning have been examined by Nexant and Government Economist (GEcon) and cross-checked against their own independent forecasts. HEC's demand forecasts are slightly higher than those by Nexant and GEcon while its sales forecasts are slightly lower. Nexant opines the variations reasonable and recommends acceptance.

8. The forecasts of Nexant and GEcon were based on economic data available in late 2004. The new Gross Domestic Product (GDP) figures announced by Government in March 2005 are 4.5 to 5.5% for

[1] Nexant is a consulting services provider headquartered in San Francisco, U.S.A., which provides energy policy, power system planning and applications consultancy services to clients worldwide. Nexant has been engaged in providing advisory services on the two power companies' development proposals and technical issues to Government of the Hong Kong Special Administrative Region since 2001.

2005 and 4% per annum for 2006 to 2008. Both Nexant and GEcon opine the latest GDP figures to be close to those available in late 2004 and the slight differences will not have material impact on the load forecasts.

II. Capital Projects

9. Capital projects (with useful life extending beyond or commencing after 31 December 2008) included in the Financial Plan can be broadly categorized into –

(a) projects required to meet demand and to be commissioned on or before 31 December 2008, and some of them may have some works and expenditure required after 2008; and

(b) projects required to meet demand and to be commissioned after 2008, but with part of the expenditure to be incurred on or before 31 December 2008.

10. As the existing SCA will continue until December 2008, the Government is in a position to consider the projects in paragraph 9 above under the existing SCA, and, where appropriate, approve the capital expenditure to be incurred up to December 2008.

11. Members were informed on 31 January 2005 that we are working on the future arrangements for the electricity market after the expiry of the current SCAs in 2008. We are hence very mindful that this 2004 to 2008 Financial Plan under the current SCA, and Government's approval of it, should not pre-empt future regulation of and arrangements for the electricity market after 2008.

12. HEC has since revised its 2004 to 2008 Financial Plan, which now excludes projects falling within paragraph 9(b) above (vide paragraph 23 below) except with regard to the emission reduction projects (vide paragraphs 19 to 22 below). We have also made it explicitly known to HEC that Government's approval of the 2004 to 2008 Financial Plan should not pre-empt Government's consideration of future regulation of and arrangements for the electricity market after 2008, nor should it give rise to any expectation of renewal or extension of the SCA or any expectation of entitlement to cost recovery and/or return on investments in the relevant assets.

Generation Development

13. In the revised 2004 to 2008 Financial Plan, HEC has proposed to –

(a) commission the first 300MW gas combined cycle unit (L9) in 2006, pursuant to the agreement reached with Government in 2003;

(b) convert the oil-fired GT57 combined cycle unit to a gas-fired unit, to meet the conditions in the Environmental Permit for construction and operation of this unit;

(c) carry out the following two environment-related projects pursuant to the understanding reached in the 2003 Interim Review –

  (i) construct and commission a 800kW commercial-scale wind turbine at Tai Ling, Lamma Island in 2006, as a demonstration project on the use of renewable energy for power generation; and

  (ii) retrofit the two coal-fired Units L4 and L5 with Low NOx Burner (LNB) and Flue Gas Desulphurization (FGD) plant for reducing atmospheric emissions; and

(d) exclude the new generation unit (L10) (accepted in last Financial Plan for 1999 to 2004) expected to be commissioned in 2010.

(a) <u>The first 300MW gas combined cycle unit (L9)</u>

14. Government had agreed to HEC's proposal to commission the first 300MW gas combined cycle unit (L9) at the Lamma Extension in 2004 in the context of HEC's previous Financial Plan in 2000. In the light of the updated maximum demand forecasts, we had further agreed to HEC's proposals to defer commissioning of L9 from 2004 to 2005 and then to 2006.

15. HEC's latest maximum demand forecasts confirm that the unit L9 will be required in 2006. We share Nexant's view that the proposed budget required to complete the project in the 2004 to 2008 Financial Plan period is reasonable.

(b) Conversion of oil-fired GT57 unit

16. With the approval of the previous Financial Plan in May 2000, the gas turbines GT5 and GT7 were converted into a combined cycle unit GT57 with the total capacity increased by 115MW (under gas-firing) or 107MW (under oil-firing) in September 2002 to ensure continued reliability of electricity supply. HEC's latest proposal to convert the oil-fired to a gas-fired unit is to meet the conditions in the Environmental Permit for construction and operation of GT57. We agree with Nexant that the project is justified in lowering emissions from generation activity and the proposed budget reasonable.

(c) Environment-related projects

17. Members were informed on 24 November 2003 that, during the 2003 Interim Review, we have reached an understanding with HEC whereby –

(i) HEC recognizes Government's efforts in exploring alternative power sources including renewable energy, to supplement conventional power generation from fossil fuels and in promoting public awareness of these alternative power sources and participation in the exploration. To this end, HEC is prepared to plan and set up commercial scale wind turbines for public demonstration and efficiency testing, subject to detailed feasibility studies and further discussion on the implementation details with Government; and

(ii) HEC recognizes Government's efforts to improve regional air quality. Government will continue discussions with HEC on substantive means to achieving emission reduction needed to meet the emission caps that will take effect from 2010.

(i) Commercial scale wind turbine

18. With regard to paragraph 17(i), HEC now proposes to construct and commission a commercial-scale wind turbine of 800kW at Tai Ling, Lamma Island. Nexant has confirmed and we agreed that the wind turbine technology is a proven commercial renewable technology and the cost of the project is reasonable.

(ii) Emission reduction projects

19. To improve regional air quality, Government and Guangdong reached a consensus to reduce, on a best endeavour basis, the emission of four major air pollutants in the region by 2010. To meet the emission reduction targets, we will need, inter alia, to cap HEC's emissions in 2010 by stipulations in the Specified Process Licences to be issued by the Environmental Protection Department (EPD).

20. Pursuant to paragraph 17(ii) above, HEC proposes to retrofit the two coal-fired Units L4 and L5 with LNB and FGD plant for reducing atmospheric emissions of nitrogen oxides (NO_X) and sulphur dioxide (SO_2) respectively. Having assessed the proposed projects against the 2010 emission reduction targets, Nexant opines that –

(i) HEC cannot meet the emission targets to be stipulated by EPD for SO_2, NO_X and respirable suspended particles (RSP) by 2010, but

- will be able to meet the target for NO_X from 2011 onwards when the FGD and LNB retrofit projects are fully implemented; and

- will meet the target for SO_2 from 2011 if the gas-fired combined cycle L10 unit is also in service in 2010;

(ii) HEC's proposal is the most viable and cost-effective option[2] for reducing SO_2 and NO_X emissions, among other alternatives, such as repowering of existing coal fired units with Combined Cycle Gas Turbine (CCGT) and switching to natural gas for the existing coal fired units;

(iii) HEC's proposed budget is within the industry norm and is justified; and

(iv) HEC has not put forward any proposal to reduce RSP emissions – the FGD retrofit will lower the RSP emissions to some extent. However, there are no cost effective technologies available to further reduce RSP on coal fired

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[2] : The new FGD and LNB systems would reduce emissions of SO_2 by about 90% and NO_X by about 60% from the Lamma 4 and 5 units.

units already equipped with electrostatic precipitators. Repowering of existing coal fired units with CCGT and switching to cleaner fuel (which will entail higher cost and be dependent on additional gas supply), or RSP emission trading (when such is available in the regional market) are the only alternatives.

21. Although the projects are designed to meet the 2010 emission targets and commissioned after the expiry of the current SCA, we support the emission reduction projects as they help to reduce air pollutants and facilitate meeting the emission reduction targets needed for improving the air quality in Hong Kong and the Pearl River Delta Region.

22. Nevertheless, the projects are not sufficient for achieving the 2010 targets and HEC will need to take additional measures to ensure that, if the Company were to continue to meet in whole or in part the demand for electricity or requirements for electricity after 2008, the intended emission caps for 2010 which may apply to HEC would be met. In this connection, HEC has been informed specifically that the consideration or approval of HEC's 2004 to 2008 Financial Plan shall not be or be taken as a representation or promise that the Government considers or has accepted as adequate the emission reduction projects in meeting the intended emission caps as conditions which may be specified upon renewal of Specified Process Licences issued by the Authority to HEC pursuant to the Air Pollution Control Ordinance before, on or after 31 December 2008.

(d) Exclusion of new generation unit L10

23. Government had endorsed HEC's proposal to commission L10 in 2006 in the context of HEC's previous Financial Plan, subject to a review of HEC's updated demand forecasts. Based on the latest load forecast, HEC has proposed to defer this project to 2010. With the uncertainty over the post-2008 arrangement, HEC has further proposed to exclude L10 and the related projects from their revised 2004 to 2008 Financial Plan.

Transmission and Distribution Development

24. HEC's transmission and distribution development proposals, covering new substations, reinforcement of existing circuits and replacement or upgrading of certain existing cables, are mainly ongoing

projects or projects approved but deferred from the previous Financial Plan. Nexant reckons the proposals reasonable. We agree that the projects are required to ensure supply reliability and safety.

Customer and Corporate Services Development

25. Projects relating to customer and corporate services include information system development and replacement of vehicles and furnitures. We share Nexant's views that these projects are reasonable.

III. Energy Conservation and Efficiency

26. HEC had included in its previous Financial Plan a package of Demand Side Management (DSM) programmes to encourage non-residential customers to contribute to energy efficiency and environmental protection. When the programmes were completed in 2003, the Energy Efficiency & Conservation (EE&C) Working Group was formed to coordinate the efforts among Government and the power companies to promote energy efficiency in Hong Kong. EE&C activities such as school education programmes, community information programmes and technical advisory services for customers will continue during the 2004 to 2008 Financial Plan period.

27. Nexant has recommended that HEC should conduct customer surveys to gain more insight into how electricity is used, to better target future EE&C programmes and to improve load forecasting work. We will review the effectiveness of HEC's EE&C programmes with HEC each year with a view to identifying and bringing about improvements in the future.

IV. Financial Aspects of the Financial Plan

Capital Expenditure

28. Capital expenditure in the revised Financial Plan relates mainly to ongoing projects or projects deferred from the previous Financial Plan. HEC forecasts that total capital expenditure over the period 2004 to 2008 will amount to around $12 billion.

Permitted Return and Net Return

29. The Permitted Return of HEC is based on its Average Net Fixed Assets and the Net Return is derived after taking into account

certain deductions provided for in the SCA. The projected average annual Net Return over the period 2005 to 2008 is higher than those in the previous Financial Plan period, but within the level provided under the terms of the SCA.

Development Fund (DF)

30. Under the SCA, any excess in Net Revenue over the Permitted Return, after deduction of excess capacity adjustment, is transferred to the DF. The main purpose of the DF is to assist in the acquisition of fixed assets and the balance may be reduced to meet any shortfall in net revenues. With the depletion of the DF in 2003 and 2004, the extent to which HEC's capital expenditure programme is financed by the DF in the Financial Plan period would be minimal.

Tariff Levels

31. HEC has increased its net electricity tariff for 2005 by 6.5%, which includes a 5.9% increase in basic tariff, pursuant to the SCA (vide paragraph 5 above).

32. With capital expenditure on on-going projects to ensure reliable safe supply and new projects to minimize environmental impact, DF and Rate Reduction Rebate accounts completely depleted, projected increase in fuel cost and the deficit in the Fuel Clause Account, HEC's projected average annual increase in net tariff for 2006 to 2008 is projected to be slightly above the forecast inflation rate of 3.0% per annum for the period. However, it should be borne in mind that in practice, the actual basic tariff to be charged to consumers each year will be determined in the preceding year, following discussions between Government and HEC during the annual Tariff Review, taking into account any variations in the component parts of the Financial Plan.

V. Environmental Implications

33. The commissioning of the natural gas-fired combined cycle gas turbine Unit L9 in 2006 will help stablise emissions by HEC. The environmental benefits of HEC's proposed emission reduction projects will not be fully reaped until around 2011.

34. Albeit practical and cost-effective, HEC's current emission reduction proposal will not be able to meet the intended emission caps for 2010. EPD opines that additional measures are required to be taken by

the HEC to reduce the emissions, and these could be replacing some coal-fired units with new gas-fired combined cycle gas turbines or purchasing credits in the emissions trading market. Nevertheless, such measures, if taken, be it individually or in combination, will necessarily have implications on, among other things, tariff.

35. The increase in electricity generation will inevitably increase the emission of carbon dioxide (CO2), one of the important greenhouse gases (GHG), although the increase will be partly alleviated when the new gas-fired unit L9 starts operation in 2006. The emission reduction projects will also lead to a slight penalty in terms of efficiency which will also lead to a slight increase in emissions. Although Hong Kong is a very small emitter of GHG emissions in the global context (contributing to about 0.2% of the global emissions), it will help stabilize the GHG emissions if HEC could further shift its generation mix to more gas by installing additional gas-fired units, which again will have implications on tariff.

VI. Sustainability Implications

36. A sustainability assessment of HEC's 2004 to 2008 Financial Plan shows that HEC's proposal should contribute positively to the economic development of Hong Kong by ensuring that reliable, safe and efficient electricity will continue to be delivered to consumers at reasonable costs. Moreover, the commissioning of the commercial-scale wind turbine as a demonstration project is in line with Hong Kong's Sustainable Development Strategic objective of promoting the use of renewable energy. It would be desirable if there is further planning of possible renewable energy facility, following the successful commissioning of the wind turbine.

Consultation with the Energy Advisory Committee

37. We have consulted the Energy Advisory Committee. The Committee supports HEC's proposals in the 2004 to 2008 Financial Plan.

Economic Development and Labour Bureau
22 July 2005