

For discussion
on 15 December 2008

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS**

District Cooling System at the Kai Tak Development

PURPOSE

This paper seeks Members' support for the Administration's proposal to upgrade the project of implementing a District Cooling System (DCS) at the Kai Tak Development (KTD) (5045CG) to Category A at an estimated cost of about \$1,402 million in money-of-the-day (MOD) prices, prior to the submission to the Public Works Subcommittee (PWSC) and Finance Committee (FC) for funding approval.

BACKGROUND

2. A DCS is a large scale centralized air-conditioning system. It produces chilled water at the central chiller plants and distributes the chilled water to user buildings for air-conditioning purpose. The DCS is an energy-efficient air-conditioning system as it consumes 35% and 20% less electricity as compared with traditional air-cooled air-conditioning systems and individual water-cooled air-conditioning systems using cooling towers respectively.

3. The Electrical and Mechanical Services Department (EMSD) commissioned a study on the implementation of a DCS at South East Kowloon Development (SEKD) in 2001, the findings and recommendations of which were supported by this Panel in end 2002. Further to the SEKD study, an updated study on DCS based on the KTD plan was completed in late 2007. The Energy Efficiency and Conservation (EE&C) Sub-committee of the Energy Advisory Committee was consulted and supported the findings of the updated study in January 2008.

4. As announced in this year's Policy Address, the Government plans to implement a DCS at the KTD. With its higher energy efficiency, the project is expected to bring about significant environmental benefits, which are detailed in paragraph 14 below.

THE PROPOSAL

5. The proposed DCS comprises a northern chiller plant, a southern underground chiller plant and underground seawater pumphouse, seawater pipeworks, chilled water pipeworks and connection facilities at user buildings at KTD. The estimated cooling capacities of the proposed DCS is 284 MW cooling energy based on the total planned public and private non-domestic air-conditioned floor area of about 1.73 million m². A conceptual layout plan¹ showing the proposed DCS at the KTD is at the **Annex**.

6. The proposed DCS is for public and private non-domestic developments at the KTD. As a demonstration of Government's determination to reduce energy consumption, all public developments in the region will connect to the DCS provided that their implementation programme can match the development schedule of DCS. The connection to the proposed DCS for private developments would be on a voluntary basis. The EMSD will approach the relevant private developers at an early stage to promote the service.

7. The private sector will be engaged for the design, construction and operation of the DCS under a Design-Build-Operate model contract.

8. The project will be developed and commissioned for operation in three phases to suit the three major groups of developments with potential of using DCS services. We plan to commence design and construction in the second quarter of 2010 for completion of the first phase in end 2012 for operation from 2013 onward. The second and third phases will be completed in end 2016 and end 2021 for operation from 2017 and 2022 respectively.

FINANCIAL IMPLICATIONS

9. We estimate the capital cost² of the proposed works to be about \$1,402 million in MOD prices. We plan to make funding application to the Legislative Council PWSC and the FC in the 2nd quarter of 2009.

10. The provision of DCS service to users will be subject to a tariff. We will introduce a new piece of legislation into the Legislative Council for the Government to charge tariff for the provision of DCS services and

¹ As the project will be implemented under a Design-Build-Operate contract, the conceptual layout of the proposed works is for illustrative purpose only and subject to the contractor's design.

² These are the latest estimates of the capital cost and new job opportunities.

to provide for the necessary powers and duties in relation to the operation of DCS services. We envisage that the Government should be provided sufficient flexibility to determine the charging structure, tariff levels and adjustment mechanism to ensure that the capital and operating costs can be recovered from users (i.e. taxpayers should not subsidise their air-conditioning charges), while the tariff can be set at a competitive level comparable to the charge of individual water-cooled air-conditioning systems using cooling towers (one of the most cost-effective air-conditioning systems available in the market) so as to attract a critical mass of private users to connect to DCS.

11. We estimate that the design and construction of the proposed works will create about 368 jobs² (299 for labourers and another 69 for professional/technical staff), providing a total employment of 18,750 man-months.

PUBLIC CONSULTATION

12. We consulted the EE&C Sub-committee on the proposal at its meeting on 24 October 2008. We also consulted the Wong Tai Sin District Council on 18 November 2008 and the Environment and Hygiene Committee of Kwun Tong District Council on 2 December 2008. All the above consulted parties supported the proposed project.

13. We have also planned to consult the Housing & Infrastructure Committee of Kowloon City District Council and Harbour-front Enhancement Committee on 11 December 2008 and 15 December 2008 respectively.

ENVIRONMENTAL IMPLICATIONS

14. The proposed DCS will bring significant environmental benefits. By implementing the proposed project, the maximum annual saving in electricity consumption will be up to 85 million kWh, with a reduction of 59,500 tonnes of carbon dioxide emission per annum.

15. The proposed DCS is not a designated project under the Environmental Impact Assessment (EIA) Ordinance. A Preliminary Environmental Review for the project has been completed in December 2003 under the “Agreement No. CE 51/2000 – Implementation Study for a District Cooling Scheme at SEKD”. The temperature and residual chlorine in the seawater discharges have been assessed to only have minimal impacts on the receiving marine waters. In short, the DCS will

not have any unacceptable impact on the environment during both the construction and its subsequent operation stages. An Environmental Review on the seawater discharges which has been undertaken by the consultants of the current initial engineering design of the project has reassessed the impacts and also confirmed the findings.

16. The environmental impacts of the DCS have also been assessed in the Schedule 3 of the EIA study for the KTD carried out by the Civil Engineering and Development Department. The EIA study indicates that the DCS will not have adverse environmental impacts during both construction and operational stages, including in particular the potential impacts arising from the residual chlorine and thermal plume of the seawater discharges to the receiving marine waters and ecological sensitive receivers in these waters.

17. Regarding the release of residual chlorine in the seawater discharges of DCS, a discharge license would be required from the Director of Environmental Protection (DEP). Hence, the DCS operator is subject to the control imposed by the DEP under Water Pollution Control Ordinance. The seawater discharge residual chlorine level will be designed at a standard more stringent than that of the prevailing licensing requirements.

18. For short term impacts during construction, we will control noise, dust and site run-off to levels within established standards and guidelines, through the implementation of mitigation measures such as the use of quiet construction plant to reduce noise generation, water-spraying to reduce dust emission and proper pre-treatment of site run-off. We will also carry out close site inspections to ensure that these recommended mitigation measures and good site practices are properly implemented.

19. We have considered in the planning stage ways to reduce the generation of construction wastes where possible. We will require the contractor to reuse inert construction waste including excavated soil and demolished concrete for backfilling on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste to public fill reception facilities³. We will encourage the contractor to maximize the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimize the generation of construction waste.

³ Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

20. We will also require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation measures to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and any non-inert construction waste to public fill reception facilities and landfills respectively through a trip-ticket system.

ADVICE SOUGHT

21. Members are invited to support the Administration's proposal for upgrading the project to Category A at an estimated cost of about \$1,402 million in MOD prices.

**Environment Bureau
Electrical and Mechanical Services Department
December 2008**

Conceptual Layout Plan of the District Cooling System at the Kai Tak Development

