

**For discussion on
4 July 2012**

**Legislative Council
Panel on Environmental Affairs**

**Legislative framework of the proposed charging arrangements for
the District Cooling System at the Kai Tak Development**

Introduction

This paper invites Members' views on the legislative framework of the proposed charging arrangements for the district cooling services provided by District Cooling System (DCS) at the Kai Tak Development (KTD) area.

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. As compared to traditional air-cooled air-conditioning system and individual water-cooled air-conditioning systems, DCS is 35% and 20% more energy-efficient. To promote energy efficiency and conservation, and with the support of the LegCo, the Government is constructing a first-of-its-kind DCS at KTD – a region which has a planned total of about 1.73 million square meters of non-domestic air-conditioned floor areas requiring about 284MW cooling capacity. Given the high energy efficiency of DCS, the maximum annual saving in electricity consumption will be 85 million kilowatt-hour (kWh), with a corresponding reduction of 59,500 tonnes of carbon dioxide emission per annum.

3. Apart from energy saving, the DCS would bring about the following benefits for individual users –

- (a) reduction in upfront capital cost for installing chiller plants at their buildings; the reduction is about 5-10% of the total building cost;

- (b) more flexible building designs for user buildings as they do not need to install their own chillers and the associated electrical equipment;
- (c) a more adaptable air-conditioning system to the varying demand as compared to individual air-conditioning systems; and
- (d) the service quality and reliability will be overseen by the Electrical and Mechanical Services Department (EMSD).

4. On 18 February 2011, the Finance Committee of the Legislative Council (LegCo) approved the project estimate of \$1,861.8 million in money-of-the-day prices for implementing phases I and II of the DCS at KTD. The two phases are currently under construction.

5. The DCS will provide services to public and private non-domestic developments at KTD. All public developments in the region, which account for up to 35% of the total air-conditioned floor area in KTD, are mandated to subscribe to DCS services. Heeding the advice of the Members of the LegCo Panel on Environmental Affairs, we will also require all private non-domestic projects in the KTD to subscribe to the DCS with a view to maximizing the environmental benefits of the project. As we informed Members before, a requirement to connect to the DCS will be prescribed in appropriate provisions in the conditions of sale. As a general practice for new developments on sale sites, Lands Department (LandsD) will check compliance with the positive obligations under the conditions of sale before the issuance of Certificate of Compliance, which would only be issued to the purchaser by LandsD upon satisfactory compliance with such positive obligations. Insofar as the DCS is concerned, LandsD will consult EMSD to ensure that the compliance is to the satisfaction of EMSD.

Proposed charging mechanism

Payment of tariff

6. All public and private non-domestic developments that use district cooling services will be required to pay the DCS charges to the Government. As DCS is to provide chilled water for central air-conditioning system on a building basis, the DCS tariff will be collected from the building owners of the central air-conditioning systems or their authorized agents such as the building management offices. The tariff will be collected on a monthly basis.

Charging principles

7. As we informed Members before at the previous panel meetings in June and July 2010, the DCS tariff should be set at a competitive level comparable to the cost of individual water-cooled air-conditioning systems (WACS) using cooling towers, which is one of the most cost-effective air-conditioning systems available in the market. We also intend to recover both the capital and operating costs from users over the project life, which is estimated to be 30 years, as taxpayers should not subsidise such air-conditioning charges.

8. EMSD has commissioned a consultancy study to develop the charging mechanism having regard to international practices and features of the DCS at the KTD. Apart from the above principles, the proposed charging mechanism is designed towards achieving the objectives of providing price stability and a simple charging regime with common charge rates for all consumers regardless of their load profiles.

Key tariff components

9. In line with international practices, the proposed tariff of district cooling services will comprise two major components, namely the capacity charge and the consumption charge -

(a) Capacity Charge

the capacity charge serves to cover the capital cost of the DCS plant and operation and maintenance (O&M) cost such as the O&M cost by contractor, staff cost and emergency repair cost. The capital cost will also cover the cost associated with the connection of a consumer to the DCS,

including heat exchanger, piping, instrumentation and wiring. The capacity charge will be levied according to the contracted cooling capacity demand, which will be determined by the consumer before the connection of the DCS; and

(b) Consumption Charge

the consumption charge will be levied to cover costs that will vary according to the demand of the consumer. The major part of the charge is the cost of electricity used to generate chilled water delivered to the consumer.

10. Apart from the abovementioned major tariff components, two other charges will be imposed as necessary-

(a) Capacity Overrun Charge

to discourage consumers from deliberately underestimating their contracted cooling capacity (thereby paying a lower capacity charge), which may affect the reliability of the total estimated cooling capacity; a capacity overrun charge will be levied if the peak cooling capacity demand exceeds the contracted cooling capacity. The actual cooling capacity demand will be measured by meters, and if the peak cooling capacity demand is higher than the contracted cooling capacity, the consumer will have to pay an extra 10% for the overrun part; and

(b) Financial Penalties for Unpaid Charge

in case a charge is not paid on or before the date specified in the bill, a late payment penalty equal to 5% of the unpaid amount will be charged. If the amount remains unpaid 6 months after the date specified in the bill, the payment penalty will be 10% of the total billed and unpaid amount.

11. Also, a deposit shall be paid by each consumer to cover any charge due. The deposit shall be paid before the district cooling services are provided, and the amount of deposit is two times of the estimated monthly tariff.

Charging formulae

12. The charging formulae of capacity charge and consumption charge are as below-

(a) Capacity Charge

monthly capacity charge = contracted cooling capacity (kW_r)¹ x capacity charge rate (\$/kW_r) + capacity overrun charge² (if applicable); and

(b) Consumption Charge

monthly consumption charge = measured cooling energy consumption (kW_{hr}) x consumption charge rate (\$/kW_{hr})

Tariff adjustment mechanism

13. Having regard to the composition of the two charges, the capacity charge rate is proposed to be adjusted annually based on the Composite Consumer Price Index while the consumption charge rate is proposed to be adjusted annually to take account of the change in electricity tariff rate. The tariff adjustment formulae are at **Annex**.

14. As the actual cost and revenue may deviate from the forecast, apart from the annual tariff adjustments, a regular tariff review will be conducted at least once every 5 years.

Legislative framework

15. To provide the necessary legal backing for the above charging arrangements and other related matters, a new Bill is being prepared, which we plan to introduce into the Legislative Council for scrutiny in the 2012-13 legislative session.

16. The Bill will include the following key provisions-

(a) Application of the Ordinance

¹ Contracted cooling capacity is to be confirmed by the consumer prior to the connection of the DCS.

² A capacity overrun charge of 10% will be levied if the peak cooling capacity demand is higher than the contracted cooling capacity. In other words, a capacity overrun charge is equal to (peak cooling capacity demand - contracted cooling capacity) x capacity charge rate x 1.1.

apart from the DCS at the KTD, the Bill will provide that it may apply to other DCS that may be constructed by the Government in future as necessary;

(b) Consumers of DCS

the Bill will stipulate that consumers should pay the district cooling services charges to the Government, and that the status of consumers should be approved by the Director of Electrical and Mechanical Services (DEMS);

(c) Charges of DCS

the various tariff components, the charging formula and the adjustment mechanisms as mentioned above will be stipulated in the legislation;

(d) Improvement Notice

the Bill will stipulate that DEMS may issue an improvement notice to the consumer if the consumer's behaviour or installation is jeopardizing or will jeopardize the satisfactory operation of the DCS. It will also provide that DEMS may suspend the provision of district cooling services to a consumer in case of non-payment of charges or failure to comply with the improvement notices issued by DEMS; and

(e) Appeal Mechanism

any person aggrieved by the decisions of DEMS may lodge an appeal to the Administrative Appeals Board.

Consultation with stakeholders

17. We consulted various stakeholders in April to June 2012 on the DCS tariff charging mechanism and relevant arrangements. The consulted parties include professional bodies, developers association, business chambers and advisory committee as follows -

- (a) The Hong Kong Institution of Engineers;
- (b) The Hong Kong Institute of Surveyors;

- (c) The Hong Kong Institute of Architects;
- (d) Building Services Operation and Maintenance Executives Society;
- (e) The Hong Kong Association of Property Management Companies;
- (f) The Real Estate Developers Association of Hong Kong;
- (g) The Hong Kong General Chamber of Commerce; and
- (h) Energy Efficiency & Conservation Sub-committee of the Energy Advisory Committee.

18. The parties we consulted welcomed the implementation of the DCS at KTD and did not raise any objection to the proposed charging mechanism. Some suggested that more flexibility should be allowed for users to adjust their estimated cooling demand, while some asked for more information on the reliability of DCS. There was also a suggestion that a regular liaison group with DCS users be set up to ensure the quality of services. We will take into account views received in the implementation of the project.

Advice Sought

19. Members' views are invited on the proposed charging mechanism.

Environment Bureau
June 2012

District Cooling Services Rate Adjustment Formula

a) Capacity Charge Rate Adjustment

The capacity charge rate is proposed to be adjusted annually with the formula below -

$$C_{n+1} = C_n (1 + CPI_n)$$

where

C_{n+1} = Capacity Charge Rate (\$/kWr/month) at $(n+1)^{th}$ period

C_n = Capacity Charge Rate (\$/kWr/month) at n^{th} period

CPI_n = Composite Consumer Price Index at n^{th} period

b) Consumption Charge Rate Adjustment

The consumption charge rate is proposed to be adjusted annually with the formula below -

$$EC_{n+1} = EC_n (E_{n+1} / E_n)$$

where

EC_{n+1} = Consumption Charge Rate (\$/kWhr) at $(n+1)^{th}$ period

EC_n = Consumption Charge Rate (\$/kWhr) at n^{th} period

E_{n+1} = Electricity Tariff Rate (\$/kWh) chargeable by the power company providing power supply at $(n+1)^{th}$ period

E_n = Electricity Tariff Rate (\$/kWh) chargeable by the power company providing power supply at n^{th} period