

Report No. 51 of the Director of Audit — Chapter 5

GOVERNMENT ELECTRICITY CONSUMPTION

Summary

1. The Government consumes a large quantity of electricity in delivering its services. The Environment Bureau (ENB) is responsible for policies on energy efficiency and conservation. The Electrical and Mechanical Services Department (EMSD) coordinates the Government's efforts in promoting energy efficiency and conservation. The Electrical and Mechanical Services Trading Fund (EMSTF) set up under the EMSD provides operation and maintenance services to government departments and autonomous public bodies on electrical, mechanical and building services installations. The Architectural Services Department (ArchSD) is responsible for designing and constructing such installations in government buildings. The Audit Commission (Audit) has recently conducted a review to examine the economy, efficiency and effectiveness in the management of electricity consumption by bureaux and departments (B&Ds).

Management of electricity accounts

2. The two electricity supply companies in Hong Kong offer two main types of tariffs for non-domestic customers, namely the General Tariff and the Bulk Tariff. For the General Tariff, electricity charges are based solely on the quantities of electricity consumed, and the unit rate on electricity consumed is higher than that under the Bulk Tariff. For the Bulk Tariff, there is an additional charge on maximum electricity demand. In general, for electricity accounts with high and steady consumption, it would be cost-effective to select the Bulk Tariff.

3. *Need to adopt cost-effective tariffs.* Audit examination revealed that, in 2007, seven government departments adopted the General Tariff for 216 high-consumption electricity accounts. The departments included the Correctional Services Department (CSD), the Department of Health (DH), the Fire Services Department, the Government Logistics Department, the Government Property Agency (GPA), the Judiciary and the Leisure and Cultural Services Department (LCSD). In response to Audit's request, the seven departments conducted reviews of these accounts. Up to September 2008, the departments had found that it would be cost-effective to select the Bulk Tariff for 42 accounts. Audit examination also revealed that four government departments (the CSD, the DH, the GPA and the LCSD) had adopted the Bulk Tariff instead of the General Tariff for 29 accounts. However, this resulted in higher electricity charges due to low electricity consumption or high maximum demand charges. *Audit has recommended that the Controlling Officers of the government departments concerned should, in collaboration with the Director of Electrical and Mechanical Services, continue their review of the electricity accounts identified by Audit to ascertain whether it would be cost-effective to select the Bulk Tariff or General Tariff, and take necessary follow-up action.*

4. *Need to issue guidelines for monitoring tariffs of electricity accounts.* The selection of appropriate tariffs for electricity accounts may bring about savings in expenditure. *Audit has recommended that the Secretary for Financial Services and the Treasury should, in consultation with the Director of Electrical and Mechanical Services and the Director of Architectural Services, issue a circular to remind B&Ds of the need to conduct regular reviews of their electricity accounts to select the most cost-effective tariffs.*

Electricity consumption of new government buildings

5. The EMSD Headquarters Building and the ICAC Building were completed in April 2005 and August 2007 respectively.

6. *Need to more accurately estimate electricity consumption.* As stated in a paper submitted to the Public Works Subcommittee of the Legislative Council (LegCo) seeking funding support for constructing the EMSD Headquarters Building, there would be no additional recurrent expenditure after relocating the EMSD facilities to the new building. However, Audit examination revealed that there was a 35% to 43% increase in electricity consumption after relocation. For the ICAC Building, in seeking funding support for the project, it was estimated that there would be a 30% increase in electricity expenditure after relocating ICAC offices to the new building. However, Audit examination revealed that the electricity expenditure of the ICAC Building was 115% more than the estimated expenditure. *Audit has recommended that the Director of Architectural Services should: (a) in collaboration with heads of B&Ds, take measures to improve the accuracy of the information on estimated electricity consumption of government building projects in future; and (b) conduct a review of the actual electricity consumption vis-à-vis the estimated consumption information after the occupation of a new government building.*

Implementation of energy-saving retrofit programme

7. In November 2004, the Financial Services and the Treasury Bureau (FSTB) approved funding of \$50 million for the EMSD to implement energy-saving retrofit projects in 2005-06. In January 2006, the FSTB approved funding of \$350 million for implementing the projects over five years from 2006-07 to 2010-11.

8. *Need to cover all B&Ds' facilities in energy-saving retrofit programme.* Audit examination revealed that the 375 projects implemented between 2005-06 and 2008-09 were proposed by the EMSTF. Most of these projects were related to the B&Ds or non-government organisations to which the EMSTF provided maintenance services. *Audit has recommended that the Director of Electrical and Mechanical Services should consider inviting all B&Ds to put up project proposals for inclusion in the energy-saving retrofit programme.*

9. *Need to set a ceiling on estimated payback period.* In considering energy-saving retrofit projects for inclusion in the retrofit programme, the EMSD accorded priority to project proposals with shorter estimated payback periods. According to the EMSD, a reasonable payback period for such projects would be less than seven years.

However, Audit examination of the retrofit programme from 2005-06 to 2008-09 revealed that the estimated payback periods of 66 projects, with a total cost of \$59.1 million, were 10 years or more. *Audit has recommended that the Director of Electrical and Mechanical Services should consider setting a ceiling on estimated payback periods for selecting energy-saving retrofit projects.*

10. ***Need to examine payback periods of completed projects.*** Audit examination revealed that, for the 58 retrofit projects implemented in 2005-06, the actual payback periods of 43 retrofit projects were longer than the estimated ones. Among these projects, the actual payback periods of eight projects exceeded the estimated ones by 10 to 50 years. *Audit has recommended that the Director of Electrical and Mechanical Services should continue to conduct reviews of the actual payback periods of completed energy-saving retrofit projects and take into account the review findings in selecting projects in future.*

Procurement of energy-efficient electrical appliances

11. ***Procurement of electrical appliances with energy labels.*** In 1995, the EMSD introduced the voluntary Energy Efficiency Labelling Scheme. Under the Scheme, the EMSD issues energy labels to product models of designated electrical appliances and office equipment if they meet the energy efficiency requirements. Up to April 2008, the EMSD had issued energy labels to ten types of electrical appliances and seven types of office equipment. However, there were no guidelines requiring B&Ds to choose from product models with appropriate energy labels in purchasing electrical appliances and office equipment. *Audit has recommended that the Secretary for the Environment should, in consultation with the Secretary for Financial Services and the Treasury: (a) conduct a review to identify suitable electrical appliances and office equipment for purchasing by B&Ds of the related product models issued with appropriate energy labels; and (b) issue guidelines requiring B&Ds to purchase electrical appliances and office equipment issued with appropriate energy labels having regard to market availability and choices available.*

12. ***Use of incandescent lamps in government premises.*** Incandescent lamps are less energy-efficient than compact fluorescent lamps (CFLs). The EMSD has taken action to promote the energy conservation benefits of CFLs and encouraged B&Ds to replace incandescent lamps with CFLs. However, Audit noted that, in 2006-07 and 2007-08, the EMSTF issued 13,521 units of incandescent lamps for maintaining lighting installations in government premises. *Audit has recommended that the Director of Electrical and Mechanical Services should continue to provide technical assistance and advice to B&Ds on replacing incandescent lamps with CFLs in government premises upon their request. Audit has also recommended that the Director of Architectural Services should, in designing lighting installations in government premises in future, adopt CFLs instead of incandescent lamps as far as practicable.*

Achievement of energy-saving targets

13. In February 2003, the Government set energy-saving targets under which B&Ds should aim to cut down in financial years 2003-04, 2004-05, 2005-06 and 2006-07 their

electricity consumption by 1.5%, 3%, 4.5% and 6% respectively, taking financial year 2002-03 as the base year.

14. ***Need to clearly define the energy-saving targets.*** In 2004, the EMSD and the ENB reported that the Government as a whole consumed 2.5% more electricity in 2003-04 than in 2002-03, and that the energy-saving target of 1.5% for 2003-04 had not been met. In 2005, the EMSD decided to adopt a “normalisation” process to adjust the electricity consumption to the same activity level as that in the base year 2002-03 for comparison. The process took into account factors such as utilisation rates of facilities and floor areas of building premises used by B&Ds. In October 2007, the EMSD reported that: (a) the “normalised” electricity consumption of B&Ds in 2006-07 had been reduced by 6.9%, comparing with that in 2002-03, and (b) the 6% energy-saving target over four years had been achieved. Audit noted that, when the Government set the energy-saving targets in February 2003, it did not mention about any allowance for activity changes or increases/decreases in floor areas. Audit also noted that the actual electricity consumption of B&Ds increased by 10.6% from 2002-03 to 2006-07. *Audit has recommended that the Secretary for the Environment should, in setting energy-saving targets in future, clearly state the basis for evaluating the achievement of the targets at the time of promulgating the targets.*

15. ***Need to clearly inform LegCo about achievement of energy-saving targets.*** In December 2006 and April 2007, the Administration respectively informed the LegCo Panel on Environmental Affairs that the Government had achieved a 3.6% reduction in electricity consumption between 2002-03 and 2004-05, and a 5.6% reduction between 2002-03 and 2005-06. In October 2007, the Administration informed the LegCo that the electricity consumption of B&Ds had been reduced by 6.9% from 2002-03 to 2006-07. Audit noted that the above-mentioned savings in electricity consumption were derived after adjusting for activity changes. *Audit has recommended that the Secretary for the Environment should, in reporting energy savings to LegCo in future, report the savings before and after adjustments, and the reasons and basis for the adjustments.*

16. ***Need for continued efforts to reduce electricity consumption.*** Although the electricity consumption after adjusting for activity changes of all B&Ds showed a reduction of 6.9% from 2002-03 to 2006-07, Audit noted that 23 B&Ds did not achieve the energy-saving target of 6%. *Audit has recommended that the Secretary for the Environment should continue implementing energy-saving programmes for B&Ds.*

Response from the Administration

17. The Administration agrees with the audit recommendations.

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