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5 January 2021

Ms Wendy Jan
Clerk to Public Accounts Committee
Legislative Council Complex
1 Legislative Council Road
Central
Hong Kong

Dear Ms Jan,

**Public Accounts Committee
Consideration of Chapter 5 of the Director of Audit's Report No. 75
"Energy efficiency and conservation in government buildings"**

Thank you for your letters dated 23 December 2020 to the Secretary for the Environment, Director of Electrical and Mechanical Services, and Director of Architectural Services respectively, requesting for information in connection with Chapter 5 of the Director of Audit's Report No. 75 on "Energy efficiency and conservation in government buildings".

Attached please find the consolidated response from the Environment Bureau, Electrical and Mechanical Services Department, and Architectural Services Department, for the Public Accounts Committee's consideration.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'José Yam', written over a light blue horizontal line.

(José Yam)

for Secretary for the Environment

c.c. Director of Electrical and Mechanical Services
Director of Architectural Services
Secretary for Financial Services and the Treasury
Director of Audit

Chapter 5 of the Director of Audit's Report No. 75
“Energy efficiency and conservation in government buildings”
Questions and Information Requested

(I) Response from the Electrical and Mechanical Services Department

Part 2: Achievement of Energy Saving Targets

Need to explore measures to complete the compilation and submission of annual reports on achievement of energy saving target as early as possible

- 1) With reference to paragraph 2.3, please advise:
 - (a) the current staff establishment which is responsible for compiling the relevant annual reports and the cost involved; and
 - (b) the content and scope of the annual reports.

Reply to 1(a) & (b):

Government bureaux/departments (B/Ds) collect annual raw electricity consumption data of their buildings every year, and make adjustments to the raw data in accordance with their operational changes such as operating hours, utilisation rates, etc. (this process is called “normalisation”). The normalised electricity consumption data are then submitted to the Electrical and Mechanical Services Department (EMSD). After sample checking, follow-ups and revisions of B/Ds’ data, EMSD carries out consolidation, calculations and compilation of the annual reports, which cover the statistics, analysis and graphs of overall electricity consumption of government buildings, as well as the electricity saving data and progress of the 2015-20 electricity saving plan for the government buildings of the respective B/Ds.

As of July 2020, the Energy Efficiency Office (EEO) of EMSD had 6 staff members with duties related to energy efficiency and conservation in government buildings on a part-time basis. The other duties of the 6 staff members include analysing and compiling the energy end-use data for Hong Kong, assisting the Environment Bureau (ENB) in formulating

energy saving targets, organising the “Energy Saving for All” campaign, etc. As EEO’s staff members are multi-tasked, it is not feasible to provide a breakdown of staff resources solely for the work on the compilation of the annual reports.

2) With reference to paragraph 2.6, please advise:

- (a) whether EMSD will make best use of technology tools to compile the returns on electricity consumption; and
- (b) whether EMSD will conduct an overall review of the Department’s use of technologies for data compilation.

Reply to 2(a) & (b):

EMSD has completed the review on the use of feasible and pragmatic information technology solutions to enhance the consolidation of energy data. EMSD will make use of information system with programming function to facilitate data input and reduce input errors by B/Ds, and to help in automatic integration and processing of the submitted energy consumption data. The information system will also enhance the data analytical and statistical capabilities so as to improve the efficiency of compilation of annual reports on the government energy saving target. EMSD will work closely with B/Ds for their feedback and suggestions with a view to continually optimising the technology solutions.

Need to continue to take follow-up actions on energy saving performance of B/Ds

3) With reference to paragraph 2.7(a), please explain whether the Administration knew the reasons why the electricity saving performance of 13 B/Ds was below the overall electricity saving achieved in 2016-2017. Did they encounter any problems in the process?

Reply to 3:

The 5% electricity saving target for government buildings in 2015-20 is a 5-year government-wide target. B/Ds formulate and implement their own energy saving and related improvement measures in accordance with

their operational requirements and own progress in order to jointly achieve the government energy saving target.

Considering that the potentials, planning and roadmaps of building electricity saving vary amongst B/Ds, and B/Ds' saving progresses are not linear, it may not be appropriate to directly compare the saving progress of individual B/D against the overall progress. EMSD does not have the detailed reasons for the 2016-17 electricity saving performance of the 13 B/Ds concerned but understands that their performance is related to the variations in their building electricity saving potentials, measures and project implementation schedules. Nevertheless, the Government has achieved the 2015-20 electricity saving target in 2018-19 (i.e. 4 years after implementation and a year ahead of schedule), with a saving of 5.7%. Although the submitted 2019-20 electricity consumption data of B/Ds are still under review, the preliminary overall government building electricity saving in 2019-20 is over 7% using 2015-16 as the baseline.

Scope for improvement in the normalisation process

- 4) With reference to paragraph 2.14, regarding EMSD's evaluation of B/Ds' achievement of electricity saving targets, please advise the relevant workflow, and the manpower and resources involved.

Reply to 4:

EMSD's assessment on B/Ds' achievement of electricity saving target is carried out together with the compilation of annual reports. For example, in the last 5-year electricity saving cycle, EMSD collected the raw and normalised electricity consumption data of government buildings from B/Ds after the end of each financial year, and conducted sample checking. B/Ds would follow up and revise the data according to the checking results. Upon completion, EMSD compiled the data from B/Ds, calculated the Government's overall electricity saving, and compiled the annual report for submission to ENB.

As of July 2020, EEO of EMSD had 6 staff members with duties related to energy efficiency and conservation in government buildings on a part-time basis. The other duties of the 6 staff members include analysing and compiling the energy end-use data for Hong Kong,

assisting ENB in formulating energy saving targets, organising the “Energy Saving for All” campaign, etc. As EEO’s staff members are multi-tasked, it is not feasible to provide a breakdown of staff resources solely for the review on whether each B/D has achieved the electricity saving target.

- 5) With reference to paragraph 2.17(a), please explain the reasons for EMSD not seeking further clarifications from the B/Ds concerned on the effect of activity changes of four venues on the normalisation calculations.

Reply to 5:

Upon receipt of the annual electricity consumption data from B/Ds, EMSD conducts sample checking, and makes inquiries or suggestions on the data of specific venues. For the 4 venues concerned, their electricity consumption was less than 0.2% of the total electricity consumption of all government buildings. Observing that the electricity savings of these 4 venues were relatively high, EMSD recommended the B/Ds concerned to review the results. All concerned B/Ds responded to EMSD’s comments and supplementary information was provided for some venues such as renovation and partial office relocation, etc. After review, the B/Ds considered that no change to the saving results of these 4 venues was necessary. Given that the operating environment is unique for each government venue, and B/Ds are intimately aware of the method and information on electricity normalisation of their buildings, EMSD usually will not oppose B/Ds’ decision on normalisation after they have taken the views of EMSD into consideration.

Need to keep under review the implementation of green energy target

- 6) With reference to paragraph 2.21, please advise:
 - (a) EMSD’s guidelines on normalisation of electricity consumption and the relevant amendments; and
 - (b) the staff establishment and resources involved in the implementation of measures to achieve the green energy target.

Reply to 6(a) & (b):

The Guide to Applying Normalisation in Electricity Consumption, prepared by EMSD with reference to the International Performance Measurement and Verification Protocol¹, is a reference document for B/Ds to apply normalisation in electricity consumption of their premises and facilities. It mainly covers the concept, principles, applications, calculation methods and practical example cases of normalisation in electricity consumption. The guide has also been uploaded to government intranet for B/Ds' reference.

Since the targets of the past energy saving plans of the Government focused on electricity saving in government buildings, the existing version of the guide was thus prepared for the normalisation calculation of building electricity consumption. In response to the Government's 2020-25 Green Energy Target that includes new scope, such as the electricity consumption of government infrastructure, and the consumption of other energy sources (such as Towngas and liquefied petroleum gas) in government buildings and infrastructure, EMSD is revising the guide for target completion in early 2021. It will be released to B/Ds as reference for the normalisation of 2020-21 energy data.

As of July 2020, EEO of EMSD had 6 staff members with duties related to energy efficiency and conservation in government buildings on a part-time basis. The other duties of the 6 staff members include analysing and compiling the energy end-use data for Hong Kong, assisting ENB in formulating energy saving targets, organising the "Energy Saving for All" campaign, etc. As EEO's staff members are multi-tasked, it is not feasible to provide a breakdown of staff resources solely for the work on the implementation of measures on the Green Energy Target.

¹ International Performance Measurement and Verification Protocol (IPMVP), <https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp>

Part 3: Management of Energy Audits and Retro-commissioning for Government Buildings

Need to ensure that government buildings meeting the selection criteria are selected for conducting energy audits

- 7) With reference to paragraph 3.6, please advise:
- (a) the reasons why it was necessary to further review the need for conducting energy audits for the four buildings concerned; and
 - (b) the selection process for conducting energy audits.

Reply to 7(a) & (b):

In accordance with the established selection criteria set out in ENB Circular Memorandum No. 1/2020, starting from 2020-21, the 3-year energy audit programme on government buildings covers buildings that have an annual electricity consumption above 500 000 kWh, energy saving performance below average level (i.e. 4.9%) in 2017-18 and potential for further energy saving; or buildings that have an annual electricity consumption between 400 000 and 500 000 kWh in 2017-18. During the planning of the energy audit programme for each year, EMSD will discuss with the concerned B/Ds to ensure that all government buildings meeting the established selection criteria will participate in the energy audit programme.

For the 4 venues mentioned in paragraph 3.6, upon further checking with the concerned B/Ds in the planning of the energy audit programme for 2021-22, it is confirmed that the 2 venues located in private office buildings are government-owned. As for the other 2 venues, they are considered having potential for further energy saving after reviewing their energy consumption data and energy saving performance. Therefore, all 4 venues meet the established selection criteria for participating in energy audits. Their energy audits will be conducted in 2021-22.

Scope for obtaining information for selected government buildings on implementation of energy management opportunities identified in energy audits

- 8) With reference to paragraph 3.9, please advise how EMSD ascertained if the B/Ds concerned had taken follow-up actions on the energy management opportunities identified in the energy audit reports and mapped out the scope of work.

Reply to 8:

During the last round of energy audit programme (2015-17), EMSD conducted energy audits on government buildings in accordance with the Energy Audit Code, and identified energy management opportunities (EMOs) for the concerned B/Ds to follow up. Being the managers of these government buildings, the concerned B/Ds would implement the EMOs as far as practicable based on various operational needs. However, some EMOs might not have been implemented due to operational constraints. During the implementation of the 3-year energy audit programme starting from 2020-21, EMSD will discuss with the concerned B/Ds to ensure that all government buildings meeting the selection criteria will be audited with a view to identifying EMOs. During energy audits, energy auditors will collect information and conduct reviews on the implementation of EMOs and the related energy savings achieved in government buildings with a view to identifying improvement areas in energy saving from the energy audit and energy management perspectives.

Need to keep under review the retro-commissioning implementation timetable for government buildings

- 9) With reference to paragraph 3.25, please advise the current staff establishment which is responsible for retro-commissioning and the resources involved.

Reply to 9:

As of July 2020, EEO of EMSD had 6 staff members with duties related to energy efficiency and conservation in government buildings on a part-time basis. The other duties of the 6 staff members include

analysing and compiling the energy end-use data for Hong Kong, assisting ENB in formulating energy saving targets, organising the “Energy Saving for All” campaign, etc. As EEO’s staff members are multi-tasked, it is not feasible to provide a breakdown of staff resources solely for the work on the implementation of retro-commissioning (RCx).

\$13 million and \$39 million was allocated to EMSD in 2019-20 and 2020-21 respectively for the implementation of RCx in government buildings.

Need to encourage the pertinent B/Ds to include the government buildings under their management in the RCx programme

- 10) With reference to paragraph 3.27, regarding the 50 buildings for which a decision was not made as to whether they would be included in the RCx programme, please advise the respective B/Ds to which they belonged and the reasons why a decision had not yet been made.

Reply to 10:

Those 50 buildings as mentioned in the report are under the management of 16 B/Ds, including the Architectural Services Department; Buildings Department; Civil Aviation Department; Commerce, Industry and Tourism Branch of Commerce and Economic Development Bureau; Correctional Services Department; Administration Wing; Education Bureau; Fire Services Department; Government Logistics Department; Government Property Agency; Hong Kong Police Force; Post Office; Independent Commission Against Corruption; Leisure and Cultural Services Department; Social Welfare Department; and Water Supplies Department.

There are various reasons why the pertinent B/Ds have not yet decided, such as: replacement / energy saving projects in respect of building services equipment in the concerned buildings are under planning or being implemented; buildings have decanting / redevelopment / renovation / demolition plans; there are concerns on the scale and arrangement of RCx and the possible impact on public services to be provided, and, there may be impact on building occupants.

Following further liaison with the pertinent B/Ds, 9 buildings have been included in the RCx programme recently. EMSD will continue to encourage the pertinent B/Ds to include their buildings in the programme and coordinate with the B/Ds to iron out practical work arrangements carefully in order to avoid or minimise possible impact on public services whilst improve building energy efficiency in a win-win situation.

Part 4: Management of Energy Saving Projects and Other Management Issues

Scope for improvement in monitoring the progress of energy saving projects

- 11) With reference to paragraph 4.6, please advise the reasons why 18 projects had fallen behind schedule by 0.9 to 1.9 years, and how the Administration will ameliorate the problem.

Reply to 11:

The delay of the actual completion of these 18 energy saving projects was mainly attributed to the social unrest earlier and COVID-19, in which a large amount of site investigation activities, tendering work, material delivery and site installation works were postponed and delayed due to various reasons such as special work arrangements, temporary closure of government venues, and delay in material manufacturing and shipment processes. Despite the difficulties encountered above, as of August 2020, the performance measurements in respect of energy saving for 14 projects were completed and the remaining 4 projects will be completed in the second quarter of 2021.

EMSD will continue to liaise closely with the B/Ds concerned to monitor the progress of energy saving projects and will conduct timely reviews to achieve the expected energy saving targets earliest possible.

Scope for improving performance measurements for energy saving projects

- 12) With reference to paragraph 4.9, please advise:

- (a) the workflow for conducting performance measurements and the staff establishment and resources involved; and
- (b) the three projects that had been completed for more than one year but for which the performance measurements were still in progress, and how the Administration will ameliorate the problem.

Reply to 12(a) & (b):

EMSD has been regularly requesting B/Ds to conduct performance measurements upon completion of energy saving projects by measuring and verifying the electricity saving performance and payback period for comparison with the original estimates in project application forms. As per the prevailing practice, the B/Ds concerned or their works agents are required to complete performance measurements within the 1-year defects liability period upon completion of the energy saving projects.

As regards the 3 projects with performance measurement taking more than 1 year to complete, the performance measurements were deferred largely due to the implementation of such measures as special work arrangements and temporary closure of government venues during COVID-19. Despite the difficulties encountered, the performance measurements for these 3 projects were completed in August 2020.

EMSD will continue to liaise and work closely with the B/Ds concerned and provide timely assistance with a view to ensuring early completion of their performance measurements within the 1-year defects liability period upon completion of the energy saving projects.

Scope for improving accuracy of project estimates

- 13) With reference to paragraph 4.11, please advise the projects which had the largest increase and decrease in cost estimates, the reasons for the misestimation, and how the Administration will ameliorate the problem?

Reply to 13:

For some energy saving projects, the actual expenditures are higher or lower than their original estimates as stated in the application forms.

This is mainly due to the revisions in the scope of works in response to the actual operational needs of the B/Ds concerned during project implementation.

The energy saving project with the largest increase in project estimate was the one with an increase of 300%, the scope of works of which was revised to include the replacement of 28 additional floodlights (on top of the original scope involving 33 floodlights) with more energy-efficient ones as requested by the B/D concerned. The replacement of these additional floodlights involved installation works at the building façade at more than 50 metres above ground level, resulting in the overall works estimate being much higher than the original plan.

The energy saving project with the largest decrease in project estimate was the one with a decrease of 96%, the scope of works of which was reduced as the number of energy efficient LED lights required for replacement was brought down from the original estimate of 1 200 to 138. EMSD has substantially revised the relevant project estimate upon review.

EMSD has all along reminded B/Ds to provide accurate project estimates in the application forms and review and update project estimates in a timely manner. As such, EMSD was made aware of, at an early stage, the surplus funding, which was then transferred to energy saving projects on the waiting list or those submitted through in-year bids.

(II) Response from the Architectural Services Department

Part 2: Achievement of Energy Saving Targets

Need to complete renewable energy projects at existing government buildings as early as possible

14) With reference to paragraphs 2.24 and 2.25, please advise:

- (a) the estimated costs of the 67 projects approved for implementation and the types of projects included;

- (b) the reasons why the implementation of nine projects had not progressed as expected, and the contents of these nine projects; and
- (c) the reasons why 14 projects were still under feasibility study, and the contents of these 14 projects.

Reply to 14(a), (b) & (c):

The estimated cost of the 67 projects that have been approved for implementation is approximately \$198 million. These projects mainly concern the addition of renewable energy (RE) systems such as photovoltaic and solar lighting systems at various types of existing government buildings.

The 9 RE projects that could not be completed by the original completion date concern the addition of RE systems including photovoltaic and solar lighting systems to the existing government buildings. They were affected by various causes, including extra time for structural design due to site constraints or lack of building plans and design calculations for the existing buildings, additional structural alteration works being required, rescheduling of works to suit the operations of the managing B/Ds concerned, material delivery being affected by COVID-19 and inclement weather affecting external works, etc. These unforeseeable situations have affected the progress of the projects.

Since September 2018, the Architectural Services Department (ArchSD) has started to plan and carry out feasibility studies for 178 RE project proposals, funding application and the implementation of these projects by batches to tally with the resources arrangement. The 14 project proposals under feasibility study as mentioned in paragraph 2.25 were the last batch in the plan. These 14 projects concern the addition of RE systems including photovoltaic and solar lighting systems at existing government buildings. Their feasibility studies were all completed in October 2020 as scheduled. ArchSD would further discuss with the managing B/Ds concerned regarding funding application and implementation details for those technically feasible projects.

Part 4: Management of Energy Saving Projects and Other Management Issues

Scope for improvement in monitoring the progress and cashflow of energy saving projects

- 15) With reference to paragraph 4.19, please advise the reasons why 58 projects had not incurred any expenditure and how the Administration will ameliorate the problem.

Reply to 15:

These 58 projects have not incurred any expenditure in the year of approval as energy saving projects are usually implemented in existing occupied premises, and the progress and expenditure for some approved projects would be affected when the works schedules need to be adjusted to meet the operational requirements of the managing B/Ds. To monitor more closely the financial position of approved energy saving projects, ArchSD has prepared regular overall progress and financial reports to timely review the situation. As the majority of the approved energy saving projects are implemented by the Electrical and Mechanical Services Trading Fund under the purview of EMSD, ArchSD has stepped up the communication with EMSD through regular project coordination meetings so as to timely handle the issues affecting project status and cashflow together.

Scope for enhancing the participation in green building certification

- 16) With reference to paragraph 4.30, please advise the process of obtaining the relevant green building certification. Has any effort been made to find out why other government buildings have not yet applied for the certification? Is it due to publicity or other reasons?

Reply to 16:

To trigger BEAM Plus assessment, the applicant should register a project by filling in Hong Kong Green Building Council (HKGBC)'s online registration form. After registration, the applicant will have to submit necessary project materials (e.g. project information fact sheet, supporting

documents and drawings) for BEAM Plus assessment. A project may be subject to two assessments, namely provisional and final assessments, depending on the type of assessment tool selected. A new building project will be subject to provisional assessment when it is at design / early construction stage. Provisional assessment offers an opportunity to the applicant to review and improve its building design before commencing the actual construction works. When all the prerequisites are achieved in the provisional assessment, HKGBC will issue the provisional certification result to the applicant. Provisional certification is valid for a period of 6 years or up to the issue of final certification result, whichever is earlier. Given the need to ensure that green and sustainable design features are actually implemented effectively after the building is completed and in operation for a certain period of time, the entire assessment cannot be finalised until a final certification result is obtained. The certificate will be issued by HKGBC upon successful assessment.

As per the Joint Circular on “Green Government Buildings” issued by the Development Bureau and ENB in April 2015, all new government buildings of construction floor area above 5 000 square metres with central air conditioning or above 10 000 square metres, should aim to obtain BEAM Plus certification as far as practicable. All 34 completed new government buildings as mentioned in paragraph 4.30 meeting the above criteria have already registered and obtained BEAM Plus certification. So far, 9 projects have obtained provisional Platinum or Gold Grade certification while 25 projects have obtained final Platinum or Gold Grade certification.

(III) Response from the Environment Bureau

Part 1: Introduction

17) How did the Administration set the four rounds of electricity saving targets described in Table 2 of paragraph 1.5?

Reply to 17:

As one of the major electricity users in Hong Kong, the Government has

been taking the lead in promoting energy saving and setting electricity saving targets. In formulating the 4 electricity saving targets as set out in table 2 of paragraph 1.5 of the report, the Government has considered the energy saving potential of the energy saving measures concerned, the electricity consumption and operations of the relevant buildings, latest developments in energy saving technologies, whether the electrical and mechanical installations have to be replaced, technical feasibility, and other relevant factors.

Part 2: Achievement of Energy Saving Targets

Need to keep under review the implementation of green energy target

18) With reference to paragraph 2.21, please advise the staff establishment and resources involved in the implementation of measures to achieve the green energy target.

Reply to 18:

All B/Ds are involved in achieving the Green Energy Target through energy saving measures, including green office management and implementation of relevant recommendations of energy audit reports. Hence, no separate staff establishment figure is available. On resources, as the energy and carbon audits are being rolled out progressively, the capital expenditure on energy saving works is not yet available. As regards promotion of RE, the Government has earmarked \$2 billion in total since 2017-18 for the installation of small-scale RE facilities at existing government buildings, venues and facilities.

**Environment Bureau
Electrical and Mechanical Services Department
Architectural Services Department
January 2021**