

MEMO

From Secretary for Development
Secretary for the Environment

Ref () in DEVB(W)517/94/09
ENB 7/2061/08

Tel. No.

Fax. No.

Date 10 April 2019

To Directors of Bureaux,
Permanent Secretaries,
Heads of Departments

(Attn.:)

Your Ref. () in

dated *Fax. No.*

Total Pages

**Development Bureau Technical Circular No. 2/2015 and
Environment Bureau Circular Memorandum No. 3/2015
on “Green Government Buildings”**

Updating of Requirement on Provision of Water Dispensers

This memo updates the circular on Green Government Buildings (Development Bureau Technical Circular No. 2/2015 and Environment Bureau Circular Memorandum No. 3/2015) (the Joint Circular) which sets out the best practicable targets to be achieved for green Government buildings.

Provision of Water Dispensers

2. To inculcate a “bring your own bottle” culture and reduce the consumption of plastic bottled water, the Chief Executive announced in the 2018 Policy Address that the Government will install more water dispensers in Government venues to which members of the public may access. The Steering Committee to Promote the Sustainable Development of the Recycling Industry chaired by the Chief Secretary for the Administration has also agreed that water dispensers or water refilling stations connected to water mains should be provided in the pantries and/or office accommodation, for use by Government employees in all new Government building projects and existing Government buildings undergoing major renovation works, with a view to reducing the consumption of water carboy in Government offices, and the relevant requirements should be incorporated into the Joint Circular.

Amendment

3. The amendments of the Joint Circular are set out in **Annex**. This memo should be read in conjunction with the memo ref. () in DEVB(W)517/94/09 & ENB 7/2061/08 dated 19 May 2017 regarding the upgraded renewable energy targets and other amendments.

Effective Date

4. The new requirements on provision of water filling type dispensers or water refilling stations (which are collectively referred as “water filling type dispensers” in the amendments set out in **Annex**) connected to water mains will apply to all new Government building projects and existing Government buildings undergoing major renovation works, with tenders to be issued on or after 1 July 2019.

5. For enquiries about provision of water dispensers, please contact Senior Environmental Protection Officer (Waste Reduction and Recycling) 4 of the Environmental Protection Department, at telephone number 2835 1172.

(Michael WONG)
Secretary for Development

(KS WONG)
Secretary for the Environment

Amendments to the Joint Circular

1. A new sub-paragraph 10(b)(viii) with an accompanying footnote is added under paragraph 10 as follows:

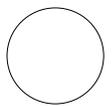
“water filling type dispensers connected to water mains¹, i.e. not bottled dispensers, should be provided in pantries and/or office accommodation for use by government employees in all new government buildings, with a view to reducing the consumption of carboy water within government offices. The same applies to water dispensers that serve the public within such new government buildings.

¹ *Given that such installation is considered feasible, B/Ds managing government buildings shall, based on the operational/service needs of specific end-user groups and actual conditions of individual sites (e.g. water source for the dispensers, site / technical constraints, etc.), determine the installation locations, number of water dispensers (i.e., water filling type, connected to water mains) to be installed, whether hot and/or chilled water should be provided, etc.”*

2. A new sub-paragraph 12(b)(vii) is added under paragraph 12 as follows:

“water filling type dispensers connected to water mains⁴, i.e. not bottled dispensers, should be provided in pantries and/or office accommodation for use by government employees in existing government buildings undergoing major renovation works as far as reasonably practicable, with a view to reducing the consumption of carboy water within government offices. The same applies to water dispensers that serve the public within such existing government buildings.

⁴ *Given that such installation is considered feasible, B/Ds managing government buildings shall, based on their operational/service needs of specific end-user groups and actual conditions of individual sites (e.g. water source for the dispensers, site / technical constraints, etc.), determine the installation locations, number of water dispensers (i.e., water filling type, connected to water mains) to be installed, whether hot and/or chilled water should be provided, etc.*



MEMO

From Secretary for Development
Secretary for the Environment

Ref () in DEVB(W)517/94/09
ENB 7/2061/08

Tel. No. _____

Fax. No. _____

Date 19 May 2017

To Directors of Bureaux,
Permanent Secretaries,
Heads of Departments

(Attn.: _____ *)*

Your Ref. () in _____

dated _____ *Fax. No.* _____

Total Pages 4 + 5

Green Government Buildings

The circular on Green Government Buildings (Development Bureau Technical Circular No. 2/2015 and Environment Bureau Circular Memorandum No. 3/2015) (the Joint Circular) sets out the best practicable targets to be achieved for green Government buildings, including the requirement that renewable energy (RE) technologies should be incorporated in all new Government buildings and all capital works projects as far as reasonably practicable. Having regard to the policy directive to promote wider adoption of RE as set out in the 2017 Policy Address, we have reviewed the Joint Circular and concluded that it is necessary to amend certain provisions. The details of the enhancements in relation to RE, as well as other incidental amendments, are set out in the paragraph 2 to 7 below.

Upgrading RE Targets

2. The Paris Agreement which was adopted at the 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in December 2015 has highlighted the need for wider promotion of RE. There is a general international consensus of the need to make a quick shift to cleaner energy sources, and RE is being adopted worldwide at an accelerating pace.

3. With the positive outcome of the Paris Agreement, Hong Kong must ready itself for making greater efforts and approach climate change

more holistically. Recognising the need to step up climate actions and to draw up long-term policies, the Steering Committee on Climate Change (SCCC) under the chairmanship of the Chief Secretary for Administration was established to steer and coordinate the climate actions of various Bureaux and Departments. A key task of SCCC is to formulate long term climate strategies to meet a new carbon reduction target beyond 2020. The SCCC decided that Bureaux and Departments should identify ways to introduce RE in a larger scale, and that the policy should be driven in a top-down manner. With the endorsement by SCCC, we will upgrade with immediate effect the RE targets as follows :

- (a) upgrade the target of electricity consumption for general power and lighting be powered by RE in new schools and educational buildings from the existing 1% to 1.5%;
- (b) upgrade the RE target in new open spaces and public park projects from 15% of general public lighting to 25%;
- (c) require Government buildings to allocate at least 10% of available roof space to incorporate appropriate scale of RE technologies;
- (d) require existing Government buildings undergoing major retrofitting and/or renovation works to seek to incorporate RE technologies if and where technically and financially practicable; and
- (e) where appropriate, install display panels to show the amount of RE generated at prominent locations in new schools and educational buildings, as well as open spaces and public parks to promote the concept of RE to public.

Other Amendments

4. In the course of reviewing the Joint Circular in relation to RE requirements, we consider it opportune to update the circular provisions on external lighting, charging facilities for electric vehicles (EVs), and financial arrangements and implications. The details are set out in the paragraph 5 to 7 below.

External Lighting

5. The Joint Circular specifies that the Government, in designing and operating external lighting installations, should make reference to latest guidelines¹ on external lighting in design external lighting. With the issue of ENB Circular Memorandum No. 5/2015 on External Lighting in July 2015, we will specify the reference to this Circular Memorandum in the Joint Circular.

Charging Facilities for Electric Vehicles (EVs)

6. As one of the mitigation measures to combat climate change, the Environmental Protection Department has been promoting EVs which have no tailpipe emissions and can help improve roadside air quality and reduce greenhouse gas emissions. The availability of charging facilities is critical to the promotion of wider adoption of EVs. In this context, the Hong Kong Planning Standards and Guidelines specify that new developments should be equipped with EV charging facilities in at least 30% of the car parking spaces and all car parking spaces should be EV charging enabling in accordance with the technical requirements specified in the relevant technical guidelines issued by the Electrical and Mechanical Services Department. The requirements do not apply to outdoor car parking spaces (with or without shelter). To reflect this arrangement, we will specify in the Joint Circular that new Government buildings should have not less than 30% of the parking spaces, except outdoor parking spaces (with or without shelter), provided with EV charging facilities² and all car parking spaces should be EV charging enabling. For existing Government buildings, EV charging facilities should be installed whenever practicable, particularly for carparks that are open to visitors.

Financial Arrangements and Implications

7. Provisions in relation to financial arrangements and implications are amended with reference to latest guidelines for recurrent costs of capital projects and FSTB's advice.

8. The amendments of the Joint Circular are set out in **Annex**.

¹ Issued by Environment Bureau
(http://www.enb.gov.hk/sites/default/files/en/node78/guidelines_ex_lighting_install_eng.pdf)

² Medium chargers with output power not less than 7kW should be provided.

Effective Date

9. This memo takes immediate effect. The new and revised requirements will apply to projects with tenders to be issued on or after 1 October 2017.

10. For enquiries, please contact Miss Fanny Cheung, Assistant Secretary for the Environment (Energy)¹ of the Environment Bureau, at telephone number 3509 8660; and Mr M K Cheung, Assistant Secretary (Project Cost Management)² of the Development Bureau, at telephone number 3509 8672.

(Eric SC MA)
Secretary for Development

(KS WONG)
Secretary for the Environment

Amendments to the Joint Circular

The following under paragraph 10 regarding new government buildings are amended to read :

- 10(a) Site and Building Aspects
- (v) for new government buildings to be provided with external lighting or illuminated advertising sign installation at building façade, the design and operation of these installations should follow ENB Circular Memorandum No. 5/2015 on External Lighting in designing and managing any external lighting.
- 10(e) Renewable Energy
- (i) all new schools and educational buildings, irrespective whether air-conditioning is provided or not, should aim to have at least 1.5% of electricity consumption for their general power and lighting be provided by renewable energy as far as reasonably practicable. Consideration should be given as far as practicable to install display panels showing the amount of electricity generated by the renewable energy technologies at prominent locations (e.g. assembly hall) where appropriate;
- (ii) for all new open spaces and new public parks projects, they should aim to:
- have at least 25% of its general public lighting be provided with electricity from renewable energy; or
 - have at least 1% of their electricity consumption be provided by renewable energy;

Consideration should be given as far as practicable to install display panels showing the amount of electricity generated by the renewable energy technologies at prominent locations (e.g. booths for handling venue reservations) where appropriate;

- (iv) all other new government buildings should allow at least 10% of available roof space² to incorporate appropriate scale of² renewable energy technologies as far as reasonably practicable;

² Available roof space refers to roof space which is structurally capable for the additional loading imposed by the installation of renewable energy technologies and is not intended for greenery/sport facilities or accommodation of building services equipment/plants. The renewable energy technologies should be of the appropriate scale that are within the capped additional costs as set out in paragraph 11.

2. A new paragraph 10(i) is added as below:

10(i) Charging Facilities for Electric Vehicles (EVs)

To support a wider use of EVs in the territory, new government buildings should aim at equipping not less than thirty percent of the parking spaces with EV charging facilities which should be medium chargers with output power not less than 7kW. This does not apply to outdoor car parks (with or without shelter).

3. The following under paragraph 12 regarding existing government buildings are amended to read:

12(a) Building Design

Existing government buildings undergoing major retrofitting and/or renovation works should seek opportunities in their design to enhance their performance in passive energy efficiency aspects such as maximizing the use of day lighting, natural ventilation and passive cooling and reduction of the thermal load transfer through the building envelope; and to incorporate renewable energy technologies as far as reasonably practicable with reference to the criteria in **Appendix A**.

12(c) Energy Efficiency

- (v) B/Ds shall endeavour to absorb the resources required for conducting energy audit. The responsible B/Ds should, in consultation with the managing party of the audited buildings and taking into account their operational

considerations, endorse the energy audit report and the EMO that may include both housekeeping measures and energy saving projects as identified in the energy audit; and

- (vi) the responsible B/Ds should also make every effort to identify funding from within their existing resources and implement the EMO based on the findings and recommendations of the energy audit reports.

4. A new paragraph 12(h) is added as below:

12(h) Charging Facilities for Electric Vehicles (EVs)
Whenever practicable, all existing government buildings should install EV charging facilities, particularly for carparks that are open to visitors. They should be medium chargers with output power not less than 7kW. This does not apply to outdoor car parks (with or without shelter).

5. Paragraph 21, 22 and 36 are amended to read:

21. B/Ds are required to absorb the resources required for carbon audit, energy audit and indoor air quality inspection or certification from within their existing resources as far as practicable. They may bid for the additional capital costs involved in the improvement works arising from the results of carbon audit, energy audit and indoor air quality inspection, as well as for incorporation of other green measures under the Framework, where absolutely necessary and justified, in accordance with established mechanism. The project proponents are required to set out the financial implications of the proposed green measures under the Framework and confirm that the measures are within the cap on payback period mentioned in paragraph 12(c)(ii) above where applicable in the context of the Capital Works Resource Allocation Exercise (RAE) or other relevant funding mechanisms (e.g. block allocations for minor building works under the Capital Works Reserve Fund or Capital Non-works RAE).

22. As regards recurrent costs, while they may differ

depending on the types of measures or features to be adopted and the operational pattern of the buildings, they are not expected to be significant and can be partly offset by savings in energy costs resulting from the implementation of energy efficiency initiatives. B/Ds are advised to refer to Financial Circular No.2/2005 and the latest FSTBCM for guidelines for RCs of capital projects.

36. While the Framework only applies to government buildings, B/Ds should encourage subvented bodies and quasi-government organisations under their purview to adopt the Framework for their new and existing buildings as far as reasonably practicable. Subvented bodies and quasi-government organisations shall endeavour to absorb the additional resource requirements from within their existing resources. Subject to the various financial caps and payback period caps as promulgated in this Circular, additional capital resources for implementing green building measures in projects funded by the Government and undertaken by subvented bodies and quasi-government organisations may be sought in accordance with the established mechanisms where absolutely necessary and justified. Irrespective of the source of capital funding, any additional recurrent funding required should be absorbed by the subvented bodies or quasi-government organisations.
6. A footnote 4 is added to section B of Appendix A as below:
 - B. PV technology, preferably with electricity grid connection, should be adopted for premises with footprint area or infrastructure projects involving open spaces or flat surfaces with unshaded solar exposure area⁴ greater than 1 000 m² (except item (e)) under the following category of buildings or venues with vast access by members of the public to showcase the applications of the technology:
 - ⁴ PV technology should not be adopted in shaded area with minimal direct solar exposure as the energy output will be significantly reduced.

7. A new paragraph is added at the end of section B of Appendix A as below:

B. Suitable measures should be adopted to minimize nuisance caused by the glare reflected from PV panels to residents/occupiers in residential/commercial/industrial developments or users of public places/facilities in the neighbourhood. Possible measures include adjusting tilting angle and orientation of the panels, and applying anti-reflective coating where appropriate.

would formulate strategies to further promote green buildings and make recommendations on relevant measures.

4. The some 8 000 buildings being managed by the Government offer a valuable opportunity for us to lead by example by integrating green features in our buildings and adopting green practices. The commitment and leadership demonstrated by the Government, as well as the tangible outcomes of our efforts, provide the driving force for the non-Government sector to take positive actions to enhance the green performance of their buildings.

EFFECTIVE DATE

5. This Circular takes immediate effect.

EFFECT ON EXISTING CIRCULARS

6. This Circular supersedes the joint Development Bureau (DEVB) Technical Circular No. 5/2009 and Environment Bureau (ENB) Circular Memorandum No. 2/2009, and the then Environment, Transport and Works Bureau TC(W) No. 16/2005.

ROLES OF DIFFERENT STAKEHOLDERS

7. Policy bureaux (in particular DEVB/ENB) are responsible for formulating green government building policy. All Bureaux/Departments (B/Ds) serving as owner or management departments of government buildings should work together with Architectural Services Department (ArchSD), Electrical and Mechanical Services Department (EMSD) and other Works Departments to ensure green building policy is followed in their design and construction of new building and renovation of existing buildings, and to seek the required resources vide the established mechanism. Owners/users are responsible for operating, housekeeping, maintaining and refurbishing government buildings according to the relevant provisions.

GREEN BUILDING PERFORMANCE FRAMEWORK

8. The Framework sets out the best practicable targets to be achieved for green buildings in general. B/Ds should adopt the Framework in planning, design and construction, operation and management, maintenance and refurbishment of new and existing government buildings unless it is technically or functionally not feasible, or could not meet the financial targets as set out in paragraphs 10(c)(iii), 11, 12(c)(ii) and 20 of this circular.

New Government Buildings

9. The Framework for new government buildings will apply to projects with tenders to be issued after 1 October 2015.

10. The Framework for new government buildings on various aspects of environmental performance, which is to be adopted where possible and applicable, is set out as follows –

(a) Site and Building Aspects

- (i) project proponent should consider various environmental performance of the site layout including but not limited to air ventilation performance with respect to site coverage, building separation and setback, building form and orientation, *etc.* at project planning stage; and, as the project design develops, to incorporate passive energy efficiency features such as maximising the use of day lighting, natural ventilation and passive cooling, sun shading, and low overall thermal transfer value (OTTV) of the building envelope;
- (ii) all new government office type buildings with construction floor area (CFA) of more than 5 000 square meters (m²) should aim to achieve a design of building envelope with OTTV at least 10% better than the requirements stipulated under the Building (Energy Efficiency) Regulation or the practice notes issued by the Building Authority as far as reasonably practicable;

- (iii) all new government quarters buildings should aim to follow the Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings issued by the Buildings Department, which sets out energy efficiency measures in connection with Residential Thermal Transfer Values of building envelopes and promotion of natural ventilation design;
- (iv) all new government buildings should aim to maximise the provision of soft landscaping such as greening at grade, green roof, vertical greening, *etc.* for enhancing the quality of the environment. They shall comply with the standards and requirements on site coverage of greenery for new government building projects as stipulated in DEVB TC(W) No. 3/2012; and
- (v) for new government buildings to be provided with external lighting or illuminated advertising sign installation at building façade, the design and operation of these installations should follow ENB's latest guidelines on external lighting in designing any external lighting.

(b) Materials, Waste Reduction and Management

Materials

- (i) all new government building projects should retain and maximise the use of existing building structure and materials on site, use certified environmentally sustainable building materials or those with high recyclable content. Life cycle environmental performance of building materials should be duly considered in materials selection where applicable;
- (ii) the framework for the procurement of recycled and other green materials as stipulated in the joint technical circular DEVB TC(W) No. 2/2011 and ENB CM No. 1/2011 should be adopted;

Waste Reduction and Management

- (iii) all new government buildings should aim to reduce the generation of waste as much as possible at all stages of a building's life cycle. Adequate space and facilities should be provided to facilitate separation, collection, sorting and storage of materials for recycling, including installation of waste separation bins and separate collection of food and yard waste for treatment where applicable and needed. All new building projects should be provided with sufficient recycling facilities (e.g. recycling bins not limiting to tricolor bins but also those for waste glass, CFLs, and rechargeable batteries, *etc.*), especially in areas accessible to the public (e.g. public facilities like libraries and parks; or public area in office buildings, *etc.*) with a view to encouraging recycling as far as reasonably practicable;
- (iv) all new government buildings with canteen or catering facilities should aim to allow adequate space and associated electrical and mechanical provisions for installation of food waste composting system or temporary storage of food waste for off-site treatment;
- (v) subject to the building users' operational and management requirements, provision of automatic waste management system should be considered for sizable government office buildings, such as the Tamar Central Government Complex and Trade and Industry Tower;
- (vi) in the case of a typical government office building, a purposely designed material recovery room and associated facilities for separation of refuse, sorting of reusable and recyclable materials and temporary storage of these materials should be allowed on every floor. The area and design of this room should be determined based on the expected quantity of waste or recyclables generated, including waste paper, metal, plastics, mercury-containing lamps, ink/toner cartridges of photocopiers and printers, rechargeable batteries, and glass bottles, *etc.*, as may be applicable. The project proponent should discuss with the user B/Ds to agree on the expected

quantity of waste/recyclables generated. For prevailing guidelines on green office management practices, please refer to CCGO Portal; and

- (vii) for new residential projects, there should be provision of space for setting up a comprehensive recycling corner (with recycling facilities for various materials) for each building.

(c) Energy Efficiency

- (i) all new government buildings with construction floor area (CFA) of more than 5 000 m² should aim to outperform BEC¹ by the following percentages –

Building Types	Requirements
office, recreational and community	> 10%
cultural, schools, educational, hospital and health facilities	> 5%
all others (e.g. fire stations, correctional facilities, park facilities, refuse collection facilities, etc.)	> 3%

- (ii) all new government buildings with CFA less than 5 000 m² (e.g. fire stations, correctional facilities, park facilities, refuse collection facilities, *etc.*) should also aim to outperform BEC by at least 3%, as far as reasonably practicable unless full justifications (e.g. site constraints, lack of space, and/or special operational requirements, *etc.*) are provided;
- (iii) all new government buildings shall incorporate energy efficient features where appropriate. Typical energy efficient features include, but not limited to, building energy management system, energy efficient lighting system, energy efficient air-conditioning system, energy efficient lift and

¹ BEC refers to the Code of Practice for Energy Efficiency of Building Services Installation issued by EMSD under the Buildings Energy Efficiency Ordinance (Cap 610).

escalator system and high efficiency motors, *etc.* Latest energy efficient technologies that would suit the operational need of the buildings concerned should be deployed as far as practicable. The maximum payback period of energy efficient measures would be capped at twelve years; and

- (iv) energy consumption monitoring systems shall be installed for all new government buildings for each piece of equipment with electrical power rating 50kW or above; and each floor or major area with sub-main distribution exceeding 100A (3-phase 380V) current capacity.

(d) Greenhouse Gas (GHG) Reduction

All new government buildings with floor area of more than 10 000m² should aim to carry out carbon audit and report the findings in the B&Ds' annual Environmental Performance Report.

(e) Renewable Energy

- (i) all new schools and educational buildings, irrespective whether air-conditioning is provided or not, should aim to have at least 1% of electricity consumption for their general power and lighting be provided by renewable energy as far as reasonably practicable;
- (ii) for all new open spaces and new public parks projects, they should aim to:
 - have at least 15% of its general public lighting be provided with electricity from renewable energy; or
 - have at least 1% of their electricity consumption be provided by renewable energy;
- (iii) for all new municipal buildings such as sports centres and swimming pool complex with high demand on shower facilities, provision of solar hot water system to reduce energy consumption in water heating should be provided;

- (iv) all other new government buildings should incorporate renewable energy technologies as far as reasonably practicable; and
- (v) renewable energy technologies should be incorporated in all capital works projects as far as reasonably practicable wherever the project satisfies one or more of the criteria in **Appendix A**. If more than one type of renewable energy technologies are applicable to a project under the criteria set out at Appendix A, the relevant B/D can decide (in consultation with EMSD when necessary) if one or more of such technologies is / are to be adopted.

(f) Water Management

- (i) all new government buildings should install water saving devices such as water-efficient water taps, toilet/lavatory equipment, urinal equipment, showers and washing machines where appropriate. For water saving devices under the Water Efficiency Labelling Scheme of the Water Supplies Department (WSD), devices of water efficiency grade 1 to 3 should be used as appropriate unless with special operational need. Devices of the highest water efficiency that meet the operational needs should be used with reference to the guidelines in **Appendix B** and any other guidelines issued by WSD from time to time;
- (ii) all new government buildings should consider the use of plant species (for greenery and landscaping) which require less watering by potable water supply;
- (iii) all new government buildings should aim to maximise the use of reclaimed water from sewage effluent, if available, for non-potable applications such as toilet flushing; and

- (iv) all new government buildings with potential of reducing their annual fresh water demand for non-potable applications through rainwater harvesting or grey water recycling system shall install on-site treatment and recycling facilities as far as reasonably practicable. The general principle is that so long as the operating and maintenance costs can be offset by the saving of the production cost for the fresh water saved, B/Ds should actively pursue implementing such facilities. More detailed guidelines are at **Appendix C**.

(g) Indoor Environmental Quality

- (i) project proponent should consider various indoor environmental quality performance aspects including indoor air quality, thermal comfort, ventilation performance, hygiene provisions and amenities maintenance, lighting quality as well as acoustics and noise mitigation measures at the design stage as promulgated under relevant design standards or guidelines in order to achieve a balanced and good working environment with optimum use of energy and other resources in operation, maintenance and management of the buildings;
- (ii) all new government buildings which are served by central air-conditioning systems should aim to achieve the “Excellent Class” of the Indoor Air Quality (IAQ) Objectives²; and
- (iii) unless otherwise justified, B/Ds should aim to participate in the IAQ Certification Scheme as promulgated by the Environmental Protection Department (EPD) upon the building completion and upkeep the Excellent Class IAQ certification thereafter.

(h) Innovations

- (i) B/Ds are encouraged to adopt innovative designs, construction techniques and practices, and application of new technologies

² The Indoor Air Quality Objectives are set out in the “Guidance Notes for the Management of Indoor Air Quality in Offices and Public Places” issued by the EPD in September 2003.

to achieve better environmental performance such as improved energy efficiency and conservation, waste reduction, water savings, and enhancements in the built environment or building operation. Examples of innovations can be found at **Appendix D** for reference; and

- (ii) B/Ds shall share with stakeholders in the building industry their experience gained in projects, if appropriate, at the relevant conferences and seminars to demonstrate government's effort and commitment to a sustainable environment, as well as to lead by example in promoting green building in Hong Kong.

11. For the measures set out in paragraphs 10(b), 10(e), 10(f), 10(g) and 10(h) above, their total additional costs involved would be capped at 2% of the total project cost.

Existing Government Buildings

12. As existing buildings are constrained by their building designs, they may not be able to achieve similar environmental performance as new buildings. However, there is scope for improvement through housekeeping measures, retrofitting or renovations as and when appropriate. The Framework for existing government buildings on various aspects of green building performance, which are to be adopted where possible and applicable, is set out as follows –

(a) **Building Design**

Existing government buildings undergoing major retrofitting and/or renovation works should seek opportunities in its design to enhance their performance in passive energy efficiency aspects such as maximising the use of day lighting, natural ventilation and passive cooling and reduction of the thermal load transfer through the building envelope.

(b) Materials and Waste Reduction

- (i) all existing government buildings should aim to reduce the generation of waste as much as possible at all stages of their building life cycle. Adequate space and facilities should be provided to facilitate separation, collection, sorting and storage of materials for recycling, including installation of waste separation bins, and separate collection of food and yard waste for treatment where possible, applicable and needed. Review on the ratio of rubbish bin to recycling bins in areas accessible to the public (e.g. public facilities such as libraries and parks; or public area in office buildings, *etc.*) are encouraged to provide sufficient facilities to promote recycling. Provision of different recycling facilities that are not limited to tricolor bins but include those for waste glass, CFLs and rechargeable batteries *etc.* should be explored;
- (ii) existing government buildings with canteen/catering facilities should aim to allow space and associated electrical and mechanical provisions for installation of food composting machine or temporary storage of food waste for off-site treatment during major renovation works as and when appropriate;
- (iii) during office space re-allocation and renovation, the provision of a material recovery room and associated facilities as stipulated in paragraph10(b)(vi) should be considered where practicable and necessary;
- (iv) all alteration and renovation works of existing government buildings should seek to maximise and retain the use of existing internal building layout and material / furniture on site, use certified environmentally sustainable building material or those with high recyclable content, where possible and applicable;
- (v) for existing residential building, we encourage the setting up of a comprehensive recycling corner (with recycling facilities for various materials) for each building where possible; and

- (vi) the framework for the procurement of recycled and other green materials as stipulated in the joint technical circular DEVB TC(W) No. 2/2011 and ENB CM No. 1/2011 should be followed.

(c) Energy Efficiency

- (i) all existing government buildings should aim to achieve an energy performance in line with the requirements for new government buildings, as stipulated in paragraph 10(c) above, wherever there are major retrofitting works for building services installations;
- (ii) the maximum payback period of energy efficient features would be capped at twelve years;
- (iii) B/Ds should carry out energy audit for existing government buildings with annual electricity consumption over 500 000 kWh and energy saving potential so as to identify Energy Management Opportunities (EMO). The energy audit of these existing government buildings should be completed by Financial Year 2017-18;
- (iv) for other existing government buildings with full year operation after the issuance of this Circular with annual electricity consumption over 500 000 kWh, and new government buildings completed after the issuance of this Circular with annual electricity consumption over 500 000 kWh, the first energy audit should be completed within five years after the building is registered with an annual electricity consumption exceeding 500 000 kWh;
- (v) the funding sources for conducting energy audit shall be identified by the B/Ds. The responsible B/Ds should, in consultation with the managing party of the audited buildings and taking into account their operational considerations, endorse the energy audit report and the EMO that may include both housekeeping measures and energy saving projects as identified in the energy audit; and

(vi) the responsible B/Ds should also identify funding and implement the EMO based on the findings and recommendations of the energy audit reports.

(d) Greenhouse Gas Reduction

All existing government buildings with floor area of more than 10 000m² are encouraged to carry out regular carbon audit to track the effectiveness of GHG reduction efforts. Carbon audit results and findings should be reflected in the B/Ds' annual Environmental Performance Report.

(e) Water Management

- (i) all existing government buildings should install water saving devices in line with the prevailing standard in new government buildings wherever there are retrofitting works for the interior service and plumbing installations where possible and applicable; and
- (ii) all existing government buildings should aim to maximise the use of reclaimed water from sewage effluent if available for non-potable applications. They should also explore the use of recycled grey water and harvested rainwater for non-potable applications whenever there are large-scale relocation or renovation works for the interior of buildings where possible and applicable.

(f) Indoor Environmental Quality

All existing government buildings served by central air-conditioning systems should aim to achieve the "Good Class" of the IAQ Objectives wherever practicable. Unless otherwise justified, the relevant B/D managing or occupying the building should aim to participate in the IAQ Certification Scheme as set out in "The Guidelines on Achieving Good Indoor Air Quality in Government Premises" issued by EPD in June 2013.

(g) Innovations

Relevant works departments and project proponents are encouraged to seek opportunities in their building renovation works to adopt innovative designs, construction techniques and practices, and application of new technologies to achieve better environmental performance or enhancement in the building operation.

GREEN HOUSEKEEPING

13. Each B/D is requested to appoint a Green Manager preferably at directorate level, and an Energy Warden. Green Managers should, according to “General Circular 9/93”, implement a programme of green housekeeping within the B/D, introduce measures to increase staff consciousness and involvement in relation to environmental issues, publicise the commitment to protecting the environment, formulating action plans and recording achievements. According to the circular on “Energy saving measures in government premises” issued on 5 October 2004, Energy Wardens are responsible for reminding colleagues to comply with energy saving housekeeping measures. Green Managers and Energy Wardens should pay particular attention to major energy consumption systems such as air-conditioning and ventilation system, lighting, lifts and escalators, office equipment, as well as computers and servers, as detailed at **Appendix E**. More details are available from the CCGO website under the “Green Management” section of the “Government Policy” category.

14. Owners or users of new and existing government buildings should ensure that adequate housekeeping measures, such as regular water efficiency audit, are in place to reduce water consumption or wastage. They are encouraged to join the Quality Water Supply Scheme for Buildings – Flushing Water and Quality Water Supply Scheme for Buildings – Fresh Water launched by WSD as far as possible.

15. To monitor progress in implementing waste reduction and recycling measures, owners or users of new and existing government buildings should arrange the building property management agent to estimate and record daily or on a regular basis the amount (volume or weight) of waste disposed of as well as the types and amount of materials recovered for recycling (e.g. paper, metal, plastics, and glass, *etc.*). From these records, the property management agent could calculate the amount of total waste generated, waste disposed of and materials recovered for recycling on a monthly basis. The ratio of the recovered materials against the amount of total waste generated is an indication of the effectiveness of the measures implemented. The owners / users should regularly review the ratio and seek to increase the ratio, or to reduce the amount requiring disposal, as much as practicable.

GREEN BUILDING LABELLING

16. The Government is committed to promoting green building in Hong Kong and leads by example to encourage private developers and building users or owners in participating in green building labelling.

17. All new government buildings of CFA above 5 000m² with central air-conditioning or above 10 000 m² (e.g. fire stations and sports centres) should aim to obtain the second highest grade or above under the BEAM Plus as promulgated by the Hong Kong Green Building Council (HKGBC) as far as practicable. Other internationally recognised building environmental assessment systems which are suitable for Hong Kong's local use and the relevant building types may be considered with full justifications.

18. For new government buildings, irrespective of its size, which serve as landmarks or are of iconic nature (e.g. Kai Tak Cruise Terminal, the Energizing Kowloon East Site Office), should consider achieving the highest grade under the assessment system as stipulated in paragraph 17 above wherever possible and applicable.

19. B/Ds may also consider participating in the various contemporary building environmental assessment systems promulgated by HKGBC as far as is reasonably practicable. Other internationally recognized building environmental assessment systems which are suitable for Hong Kong's local use and the relevant building types may be considered with full justifications.

FINANCIAL IMPLICATIONS

20. For new government buildings, on top of the 2% cap on additional cost for green measures as stated in paragraph 10, the additional cost involved in obtaining the highest grade in paragraph 17 under any building environmental assessment system would be capped at a further 2% of the total cost of the project.

21. B/Ds are required to identify funding for carbon audit, energy audit and indoor air quality inspection or certification. They may bid for the additional capital costs involved in the improvement works arising from the results of carbon audit, energy audit and indoor air quality inspection, as well as for incorporation of other green measures under the Framework in accordance with established mechanism. The project proponents are required to set out the financial implications of the proposed green measures under the Framework and confirm that the measures are within the cap on payback period mentioned in paragraph 12(c)(ii) above where applicable in the context of the Capital Works Resource Allocation Exercise (RAE) or other relevant funding mechanisms (e.g. block allocations for minor building works under the Capital Works Reserve Fund or Capital Non-works RAE).

22. As regards recurrent costs, while they may differ depending on the types of measures or features to be adopted and the operational pattern of the buildings, they are not expected to be significant and can be partly offset by savings in energy costs resulting from the implementation of

energy efficiency initiatives. However, B/Ds should endeavor to absorb the additional recurrent costs within their existing resources as far as possible and where necessary, justify and seek additional resources required in accordance with the established mechanism.

REPORTING

23. The following are to be reported by Works Departments to DEMS for monitoring the progress in the adoption of energy efficient features and renewable energy technologies.

Capital Works

24. The list of capital works projects entering Category B in the reporting period and their estimated nominal energy saving (in kWh) due to the adoption of energy efficient features.

25. The list of capital works projects entering Category B in the reporting period with the adoption of renewable energy technologies, including the type of technology adopted and the generation capacity in kW.

Minor Works

26. The list of minor works projects approved in the reporting period included as part of their alteration, addition and improvement work for the installation of energy efficient features with the estimated nominal energy saving (in kWh), and / or renewable energy technologies installed and generation capacity in kW respectively.

27. The rolling five-year works programme to upgrade existing buildings and installations through block votes to improve their energy efficiency by using energy efficient features.

28. The rolling two-year works programme for the installation of renewable energy technologies in existing buildings and installations

through block votes.

Renewable Energy in General

29. The information including, but not limited to, type, project information, installed capacity, installation details, etc. of renewable energy installations provided through any of the above means.

Energy Consumption

30. To compile and maintain information on energy consumption of B&Ds to benchmark the progress of their efforts in energy efficiency, EMSD will call for returns from B&Ds about the total energy consumption of their operation on an annual basis. The Green Managers should maintain comprehensive up-to-date records about energy consumption in all premises/facilities where the relevant B/Ds are the electricity/gas account owners or registered with the utility companies, regardless of which B/D is responsible for paying the bills. Electricity/gas consumption incurred by tenants of departmental quarters is not required to be included in the return if the bill is paid by the tenants. For proper monitoring of energy consumption, B/Ds are encouraged to identify and keep proper records of their activity changes and quantify those changes likely to affect energy consumption when compared to previous years.

31. EMSD will determine the reporting format and issue call memos to Works Departments for the information in paragraphs 24-30 above, which may be adjusted as and when necessary. Generally, all items under paragraphs 24-29 above are to be reported twice a year covering the months from April to September and from October to March. All reports sent to EMSD shall be copied to DEVB (Attn: CAS(W)1) for information.

32. Works Departments should ensure that the operating data relating to renewable energy technologies, if installed, are collected regularly and preferably through automatic recording devices.

Controlling Officer's Environmental Report

33. Environmental reports should be published and approved personally by Controlling Officers to demonstrate how the environmental aspects of his / her work are being addressed and how the environmental performance is going to be improved in future. B/Ds should report their progress in implementing the initiatives mentioned in paragraphs 12(b) – (f) above in their respective environmental reports. Details about environmental reports are set out in the ETWB Circular Memorandum No.1/2007 titled “Controlling Officer’s Environmental Report”.

TECHNICAL ASSISTANCE

34. EMSD provides technical assistance on energy efficiency and renewable energy issues.

35. Guidelines for choosing water saving devices are included in Appendix B to this joint circular, and guidelines for implementing grey water recycling and rainwater harvesting are also included in the Technical Specifications which will be uploaded onto WSD’s website. B/Ds may approach WSD for further advice if needed.

BUILDINGS UNDER SUBVENTED BODIES AND QUASI-GOVERNMENT ORGANISATIONS

36. While the Framework only applies to government buildings, B/Ds should encourage subvented bodies and quasi-government organisations under their purview to adopt the Framework for their new and existing buildings as far as reasonably practicable. Subject to the various financial caps and payback period caps as promulgated in this Circular, additional capital resources for implementing green building measures in projects funded by Government and undertaken by subvented

bodies and quasi-government organisations may be sought in accordance with the established mechanisms. Irrespective of the source of capital funding, any additional recurrent funding required should be absorbed by the subvented bodies or quasi-government organisations.

ENQUIRY

37. For enquiries on the foregoing, please contact Principal Assistant Secretary (Energy), Environment Bureau at 3509 8619, or Chief Assistant Secretary (Works) 1, Development Bureau, at 3509 8331. For technical assistance on energy saving measures, please contact Chief Engineer/Energy Efficiency A, Electrical and Mechanical Services Department at 2808 3798.



Secretary for Development
(Paul MP CHAN)



Secretary for the Environment
(KS WONG)

**Criteria for Adoption of Renewable Energy Technologies
in Government Projects or Installations**

A. Adoption of solar water heating technology

Solar water heating should be adopted for premises with centralised hot water supply systems with demand for low to medium temperature heated water under the following category of buildings:

- (a) Health care facilities: Hospital, Clinic, and Home for Elderly / Aged;
- (b) Amenity facilities: Stadium, Sports Centre, Indoor Games Hall, Holiday Camp, Swimming Pool, and Hostel; and
- (c) Government facilities: Fire Station, Police Station, Club House, Community Hall, Workshop/Depot, Laundry, Slaughterhouse, and Wholesale Market.

B. Adoption of photovoltaic (PV) technology

PV technology, preferably with electricity grid connection, should be adopted for premises with footprint area or infrastructure projects involving open spaces or flat surfaces with unshaded solar exposure area greater than 1 000 m² (except item (e)) under the following category of buildings or venues with vast access by members of the public to showcase the applications of the technology:

- (a) Amenity facilities: Park, Garden, Open Space, Sitting-out Area, Promenade, Sports Ground, Stadium, Sports Centre, Indoor Games Hall, Holiday Camp, Swimming Pool, Hostel, Civil Centre, Town Hall, Theatre, Museum, Public Library,

Community Hall, and Municipal Complex;

- (b) Education facilities: School and Education Resources Centre;
- (c) Government offices: Office Building Block providing major public services;
- (d) Road facilities: Highway Structure Enclosure, Noise Barrier and Footbridge; and
- (e) Small power system at remote / isolated locations.

Building-integrated photovoltaic (BIPV) systems, preferably with electricity grid connection, shall be installed as far as reasonably practicable on façades of buildings with consideration given to the structural and architectural design of the building and to the shading effects caused by nearby buildings/structures. Standalone system can be considered for suitable applications such as self-powered PV park lighting system.

Due consideration of placing the PV panels shall be made with regard to showcasing the applications of the technology to the general public. Instantaneous and accumulative electricity generated by the PV system shall also be recorded and displayed at prominent location(s) of the building or venue available for public viewing easily.

C. Adoption of wind turbine technology

Wind turbine technology, preferably with electricity grid connection, should be adopted for premises within sites of mean wind power density above 200W/m², without nearby obstructions to the flow of wind, under the following category of buildings or venues with vast access by members of the public to showcase the application of the technology:

- (a) Amenity facilities: Beach, Park, Garden, Open Space and Promenade; and
- (b) Small power system at remote / isolated locations.

The wind power density can be obtained from EMSD's wind resource map at <http://wind.emsd.gov.hk/>.

D. Adoption of bio-gas heating / electricity generation technology

Bio-gas technology should be adopted for premises with a bio-gas source available for the use as a fuel for heating and electricity generation under the following category of buildings or venues to showcase the application of the technology:

- (a) Sewage Treatment Plant; and
- (b) Landfill Restoration Site.

Notes: Following paragraph 10(e) of this Circular and in addition to the renewable energy technologies mentioned in the above list, Works Departments may consult EMSD in the following cases for review on the potential application of more renewable energy technologies:

- (a) projects located within 2 km of the periphery of a landfill site or a waste energy source, e.g. incinerator plant, sewage treatment plant;
- (b) prestigious projects which may draw wide media attention; and
- (c) projects where no conventional energy source supplied by public utilities is available.

Guidelines on Use of Water Saving Devices in Government Projects or Installations

1. Reference to the Water Efficiency Labelling Scheme (WELS) by the WSD, if available, should be made in choosing water-consuming devices. B&Ds and project proponents should view WSD's website at <http://www.wsd.gov.hk> for further details and the latest information of the Scheme.
2. In general, devices of water efficiency grade 1 to 3 are regarded as water saving devices. In all cases, devices of the highest possible water efficiency where minimum satisfactory operational needs are met should be used.
3. Compatibility of water heater with water-efficient devices (such as water taps and showers) should be carefully taken into account. During planning and design stage, responsible officers should always aim to use devices with the highest water efficiency grade before deciding the appropriate type of water heater to be used in conjunction. Due to their low compatibility with water-efficient devices, electric pressure-controlled type water heaters should not be used unless there is no other feasible option.
4. While water saving devices should be used in Government projects as far as practicable, B&Ds and project proponents should carefully consider operational concerns for each Government project, especially where there are more concerns about hygiene in critical applications and filling time of containers which are critical to operations. When considering the use of water saving devices in accessible lavatories, B&Ds and project proponents should ensure compliance with all requirements in Design Manual – Barrier Free Access 2008 published by the Buildings Department.

Recommendations in this guideline do not apply to hospitals.

5. WSD may in future issue other guidelines on the use of water saving devices in Government projects. B&Ds and project proponents should specify where applicable and practicable the use of water saving devices in Government projects with reference to guidelines which are available on WSD's website at <http://www.wsd.gov.hk>.

Guidelines on Implementation of Rainwater Harvesting and Grey Water Recycling Systems

Definitions

1. In this appendix, the following words and expressions shall be defined as follows:-
 - (a) “Grey water” means the water from a bath, shower, lavatory basin, sink, *etc.* but excludes water from a slop sink, toilets or urinals.
 - (b) “Reclaimed water” in this appendix means the treated water produced from a grey water recycling system (GWS), a rainwater harvesting system (RHS) or a combined system (CS).
 - (c) “Grey water recycling system” means the whole of a system of structure, plant, works, device, pipes and fittings for the purposes of collecting and treating grey water and distribution of the reclaimed water produced.
 - (d) “Rainwater harvesting system” means the whole of a system of structure, plant, works, device, pipes and fittings for the purposes of collecting and treating rainwater and distribution of the reclaimed water produced.
 - (e) “Combined system” means the whole of a system of structure, plant, works, device, pipes and fittings for the purposes of collecting and treating grey water and rainwater to produce a single supply of reclaimed water and distribution of the reclaimed water produced.

Implementation Guidelines

2. New government buildings should utilise reclaimed water from rainwater harvesting and/or grey water recycling to meet or to reduce their fresh water demand for non-potable uses³ as far as reasonably practicable.
3. Grey water should not be collected from facilities discharging clinical or chemical wastes.
4. The design, operation and maintenance of the RHS, GWS or CS as well as the inside services using the reclaimed water shall make reference to the “Technical Specifications on Grey Water Reuse and Rainwater Harvesting” promulgated by WSD, the current version of which is available on WSD’s website at <http://www.wsd.gov.hk>. Relevant statutory provisions and any other requirements pertinent to the systems as determined by B/Ds should also be complied with.
5. For RHS, GWS or CS without augmentation by water supplied from the WSD, vetting and approval by the WSD are not required⁴. If water supplied by the WSD is used for augmentation, the plumbing design of the system shall be submitted to the WSD for vetting and necessary approval and/or agreement during design stage.
6. For the purpose of water resources planning, results of supply/demand assessments of RHS, GWS or CS during the pre-construction stages and operation and maintenance records during the operation stage shall be provided to the Development (2) Division of WSD upon request.

³ Recommended non-potable uses are landscape irrigation, toilet flushing, road cleaning, car washing and fire fighting.

⁴ If no water supplied by the WSD is for augmentation of the system, there involves no inside service under the Waterworks Ordinance and Waterworks Regulations. Vetting and approval of such system by the WSD is not required.

Other Green Measures/Practices for Enhancement of Building Environmental Performance (for Consideration on Individual Project Basis)

1. Conduct of Post-Occupancy Evaluation

Project proponents, in collaboration with managing departments of concerned government buildings and subject to availability of resources, may conduct post-occupancy evaluation of selected new government building projects after building occupation for the purpose of seeking continuous improvement in the design and construction of similar building projects in future. Criteria for consideration in project selection may include, but are not limited to, the building type and scale, project complexity, building design and engineering systems adopted, *etc.*

2. Application of Building Information Modeling

The technique of Building Information Modeling (BIM) is developing fast in the construction industry. Project proponents may consider adopting BIM where appropriate in planning, design and construction of suitable new government building projects to optimise project design development and site construction activities for the benefits, among others, of minimising abortive work and construction wastes on site.

3. Sustainable Practices for Material Selection and Waste Reduction

All new government projects should consider adopting, where reasonably practicable, sustainable practices for material selection and waste reduction such as –

- maximise the use of recycled materials in site exterior surfacing work, structures and features;
- maximise the use of recycled materials for building façade and structural components, as well as interior non-structural components;
- duly consider in material selection the impact of carbon emission caused by long distance material delivery from country of origin; and

- maximise the recycling of demolition waste and construction waste.

4. Wider Use of Renewable Energy (RE)

B/Ds in planning their new government buildings should seek to make wider use of renewable energy if there are renewable power source in the vicinity, such as hydro power from nearby WSD facilities, trigeneration with use of biofuel in nearby site and power from nearby waste-to-energy facilities, *etc.*

5. Innovation and Demonstration

With progressive betterment of design practices and advancement of energy efficiency and energy saving/management technologies, opportunities might be sought to implement demonstration projects such as “carbon neutral”⁵ or “energy plus projects”⁶ to illustrate innovative design and technologies that can be applied in the future.

⁵ “Carbon neutral” means a building which is designed and equipped to offset operating energy consumed from the grid by on-site renewable energy generation with grid-feed-in on an annual basis.

⁶ “Energy plus projects” means a building generates on-site renewable energy more than operation needs. It may even exports surplus energy to offset embodied energy of its construction process and major structural materials.

Housekeeping Measures and Best Practices for Energy Savings

I. Corporate housekeeping measures and best practices

A. *Air-conditioning (A/C) and Ventilation Installation*

1. Set and maintain room temperature at 25.5°C in summer months and when the outdoor air temperature is above 25.5°C for acceptable comfort with least energy consumption.
2. Purchase room air conditioners with Grade 1 energy label under the Mandatory Energy Efficiency Labelling Scheme (MEELS) upon replacement of old equipment.
3. Display labels of the recommended temperature set point (i.e., 25.5°C for offices) at thermostatic controller of each room A/C unit and check the room temperature with thermometer to avoid excessive cooling.
4. Keep all the windows and doors close when the air-conditioner is running.
5. Keep doors between air-conditioned and non-air-conditioned areas such as those connecting the outside of the building, lift lobbies, toilets and stores shut, so as to minimise air infiltration when the air-conditioner is operating.
6. Switch off A/C units for premises with independent A/C control or reduce cooling for premises with central A/C control when occupancy is low such as on weekends, lunch time or after office hours.
7. Switch off air-conditioning in the facility/meeting room, which has separate air-conditioning control, right after use.
8. Establish a maintenance programme to ensure the A/C system, such as automatic temperature controls is operating efficiently. Inspect condition of thermal insulation of pipework regularly and carry out improvement works as necessary.
9. Clean dust filters and fan coil units regularly. Remove obstructions at air inlets and outlets of the A/C and ventilation.
10. Clean or replace dust filters before hot seasons.

11. Set the A/C system to the most energy-efficient operational mode when the outdoor air temperature is below 25.5°C. When necessary, adjust A/C temperature set-point to achieve comfort conditions.
12. Shorten the operating time of the central A/C system in cool or cold days.
13. Adjust the air distribution or rate of fresh air supply to an appropriate level when necessary.
14. Balance the air/water supply system, add dampers/valves if practicable to avoid overcooling or hot spots.
15. Review operating schedules of A/C chillers, air handling units regularly to suit operational needs.

B. Lighting Installation

1. Procure compact fluorescent lamp with Grade 1 energy label under the Mandatory Energy Efficiency Labelling Scheme (MEELS) upon replacement of old equipment.
2. Remove lamps in area over-lit by artificial lighting and in perimeter area sufficiently lit by natural daylight. Make use of daylight whenever possible to reduce energy costs.
3. Replace tungsten filament lamps for general lighting purpose (e.g., general service lamps and decorative lamps), unless justified on operational ground, with compact fluorescent lamps or retrofit with energy efficient alternatives, such as T5 fluorescent tubes, compact fluorescent lamp (CFL), light emitting diode (LED) lamps where practicable.
4. Consider to replace tungsten filament lamps for special purposes (e.g., low wattage pilot lights) and tungsten halogen lamps by more energy efficient alternatives after the current stock has been exhausted, taking into account the availability of replacement models in the market.
5. Replace conventional electromagnetic ballasts of fluorescent lamps with electronic ballasts.
6. Replace conventional exit signs with light emitting diode (LED) exit signs.
7. Maintain only those lighting which are essentially for safety, security or other specific purposes in areas that are infrequently occupied.

8. Install occupancy/motion sensors to automatically control on/off of lighting in public areas such as corridors, pantries, lavatories, *etc.*
9. Separate the lighting zone controls for the window perimeter and that for the interior. Lamps at the window perimeter can be dimmed or switched off on a sunny day.
10. For external lighting installations, use energy efficient lighting and minimize nuisance to nearby community in operation.
11. Switch off those external lighting for advertising, promotional and decorative purpose at or before 11pm. Users departments may exercise discretion on relevant operation to cater for special occasions and needs.
12. Keep all windows, light bulbs and light fittings clean to maintain optimum lighting performance.

C. Lift and Escalator Installation

1. Shut down some of the lifts or escalators during non-peak hours. For a bank of escalators, the traveling direction can be adjusted to suit the flow pattern of passenger traffic.
2. Switch off the lighting, ventilation fan and TV screen inside the lift car when the lift is in standby/idle mode.
3. Use energy saving lamps and LEDs instead of halogen spot lamps in the lift compartment.
4. Optimise the lift specification so as to save energy by using a traffic management system such as destination control.

D. Office Equipment

1. Purchase refrigerator and dehumidifier with Grade 1 energy label under the Mandatory Energy Efficiency Labelling Scheme (MEELS) upon replacement of old equipment.
2. Procure energy efficient office equipment, computer equipment and peripherals with energy labels under the Voluntary Energy Efficiency Labelling Scheme (VEELS). Further information on energy efficient office equipment under the VEELS is available at http://www.emsd.gov.hk/emsd/eng/pee/eels_pub1.shtml#GO.

E. Computer Equipment/Server Rooms

1. Procurement of IT equipment should follow the green procurement requirements stipulated in Environment Bureau Circular Memorandum No. 2/2011 which is available at http://etwb.host.ccgo.hksarg/ENB_CirNo_02_2011.pdf.
2. Maintain the operating temperature and relative humidity at 23°C +/- 3°C and 50% +/- 10% as recommended by the latest version of the Green Data Centre Practices promulgated by the OGCIO.
3. Monitor room temperature (e.g. by installing thermometers) to avoid excessive cooling.
4. Maintain adequate airflow around computer equipment and put heat-dissipating equipment closer to cold air outlets of air-conditioning (A/C) installation.
5. Locate the equipment to avoid direct sunlight, use heavy-duty blind to exclude sunlight where applicable.
6. Switch off non-essential servers after office hours and over weekends.
7. Measure server utilisations so as to identify underutilised servers for consideration of consolidation or virtualisation.
8. Measure storage utilisation for consideration of consolidation.

F. Some Tips to Engage People into Action

1. Get support from senior management. Where possible, senior management should announce an energy efficiency and conservation policy. Senior management should also demonstrate commitment to making the policy a success.
2. Explain your energy policy and housekeeping practices (and an incentive or encouragement scheme as appropriate) to all staff through briefing sessions, or other communication channels such as notice boards or emails. Make better use of electronic means in disseminating information, e.g. uploading publications onto website/homepage.
3. Affix "Save Energy" stickers at critical locations, e.g. switches, doors, exits, lifts and escalators as a reminder.

4. Create a system to keep track of organisational performance, both quantitative and qualitative, in energy saving and benchmark results against the targets set.
5. Organise forums or brainstorm sessions to identify areas of inefficiency and to develop new ideas for energy saving.
6. Appoint energy wardens to remind colleagues to comply with all housekeeping measures.
7. Assign designated officers to regularly inspect public areas and workplaces of staff. Check adequacy and effectiveness of housekeeping measures. Tighten them if necessary.
8. Hold regular (bi-weekly) short meetings with designated officers to report on the housekeeping measures.
9. Conduct walk-through every quarter to identify area requiring improvement.
10. Continuously keep track of energy consumption pattern of venues and tighten energy saving measures if necessary.
11. Communicate the energy saving measures to staff, make them aware of energy consumption, and get them committed to good energy saving practices. Use emails for communication as far as practicable.
12. Carry out energy audit to identify energy management opportunities and carry out improvement works as appropriate.
13. Keep a clear and systematic record of electricity bill, gas bill *etc.* to identify irregularities.

II. Individual housekeeping measures and best practices

A. Air-conditioning (A/C) and Ventilation Installation

1. Turn on air-conditioner no sooner than you use a room (i.e., no earlier than 15 minutes), and the last man out to turn it off upon leaving.
2. Dress light to minimise the use of A/C. Remove your suit or jacket once entering indoor. Thermal comfort achieved through wearing thick clothes under low indoor temperature is not energy-efficient.
3. Use high fan mode instead of lowering the temperature of air-conditioner.

4. Set room cooler or packaged air conditioner at low cool. If necessary, use fan to enhance the cooling effect by increasing cool air circulation or increase fresh air supply when feeling stuffy.
5. Use natural ventilation or fan where possible in place of A/C, especially during cool seasons.
6. Lower and completely close venetian blinds when direct sunlight is penetrating a window in the summer season, even if additional artificial lighting is required to compensate for the reduction in daylight.
7. For premises where the A/C systems are provided with heaters, avoid operating the heaters as far as possible.

B. Lighting Installation

1. Lights should be switched off as soon as any area becomes unoccupied. This applies to open plan office areas as well as to individual rooms.
2. Switch off some lighting when the occupancy is low, e.g. weekends, lunch time or after office hours.
3. With few people working in the office, switch off the non-essential lighting and use task lighting to directly illuminate work areas.

C. Lift and Escalator Installation

1. Encourage using the stairs (for one or two floors up or down) rather than taking the lift.

D. Office and Computer Equipment

1. Set office equipment to energy saving mode during office hours.
2. Inform staff of the power management features, ask supplier to pre-set power management features and provide training to staff.
3. Switch off office equipment that is not in use or before leaving the premises.
4. Avoid leaving office equipment in standby mode for a long period. Use appliances with timer control or automatically switch-off control functions to switch off office equipment, such as photocopiers and printers automatically after office hours.
5. Keep the number of switched on equipment that has to perform its

primary function during non-office hours to the minimum, such as forward all fax lines to one fax machine.

6. When leaving office, arrange for the last-man-out to check and switch off the power source to all air-conditioning, lighting and office equipment that are not in use.
7. Unplug equipment chargers and adapters from socket outlets when not in use.
8. Switch off computer (main unit and screen) during lunch and after office hours, or when you are away from the workplace even for a short meeting. Using "screen saver" does not save much energy (less than 10%). Reduce the brightness level of the screen to the lowest comfortable level.
9. Switch off or unplug local printers connected to computers when not in use.
10. Use the power management feature of computer to preset the computer to sleep or hibernation mode when it is idle.
11. Switch off or unplug wall socket outlets and extension cables for computer equipment after office hours to reduce standby power consumption.
12. Switch off servers on Saturdays and public holidays for non-essential internal services.
13. Switch off unnecessary lights, A/C installation, equipment and appliances. i.e., the unused screen can also be switched off if it is not viewed frequently rather than leaving it in standby or operation mode.