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SERIES L: ENVIRONMENT AND ICTS, CLIMATE
CHANGE, E-WASTE, ENERGY EFFICIENCY;
CONSTRUCTION, INSTALLATION AND PROTECTION
OF CABLES AND OTHER ELEMENTS OF OUTSIDE
PLANT

A methodology for assessing and scoring the sustainability performance of office buildings

Recommendation ITU-T L.1371

ITU-T L-SERIES RECOMMENDATIONS

ENVIRONMENT AND ICTS, CLIMATE CHANGE, E-WASTE, ENERGY EFFICIENCY; CONSTRUCTION, INSTALLATION AND PROTECTION OF CABLES AND OTHER ELEMENTS OF OUTSIDE PLANT

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Recommendation ITU-T L.1371

A methodology for assessing and scoring the sustainability performance of office buildings

Summary

Recommendation ITU-T L.1371 provides a consistent framework for building owners, managers and operators to critically assess, score and improve the sustainability performance of office buildings in 10 key areas: energy; water; air; comfort; health and wellness; purchasing; custodial; waste; site; and stakeholders.

The framework described in Recommendation ITU-T L.1371 provides a set of concrete and measurable steps to reduce environmental impacts, and specifically greenhouse gas emissions, of existing office buildings, thus contributing to the achievement of Sustainable Development Goal 11 "Sustainable cities and communities –s Make cities inclusive, safe, resilient and sustainable".

The annex to Recommendation ITU-T L.1371 specifies an assessment scoring methodology to allow owners and managers to undertake a self-assessment to evaluate their building's current status and track progress going forward.

History

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Assessment, buildings, methodology, scoring, sustainability.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

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The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Recommendation ITU-T L.1371

A methodology for assessing and scoring the sustainability performance of office buildings

1 Scope

This Recommendation specifies a methodology for assessing and scoring, and subsequently improving, the sustainability performance of existing office buildings. The methodology described in this Recommendation provides building owners, managers and operators with a consistent framework to critically assess the sustainability performance and management of office buildings in 10 key areas: energy; water; air; comfort; health and wellness; purchasing; custodial; waste; site; and stakeholders.

It should be noted that the methodology proposed in this Recommendation applies only to existing office buildings and not to the construction of new buildings.

NOTE – This Recommendation is based on the BOMA BEST Sustainable Buildings assessment programme [b-BOMA].

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are, therefore, encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is published regularly. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ISO 50002] ISO 50002:2014, *Energy audits – Requirements with guidance for use*.

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 office building: A type of building that is used by commercial, telecommunications, institutional and governmental sectors primarily to conduct various types of business, administration and professional activities.

3.2.2 preventative maintenance programme: A systematic approach that outlines what equipment under a landlord's control should be reviewed, the corrective action that should be taken and how frequently this should occur.

3.2.3 energy assessment: An audit of a building's configuration and energy systems that focuses on the identification of the potential for energy efficiency improvements.

3.2.4 energy management: A continuous process of managing behavioural, organizational and technical change to improve a building's energy performance.

3.2.5 water assessment: An audit of a building's configuration and water systems that focuses on the identification of potential water-conserving measures.

3.2.6 indoor air quality plan: The result of a selection of appropriate and achievable air-quality goals; regular surveillance and testing to verify heating, ventilation and air conditioning (HVAC) performance and hygiene; efficient and effective procedures for addressing occupant indoor air quality (IAQ) concerns; and training for all property management and maintenance personnel.

3.2.7 occupant service request programme: A programme for service requests for maintenance that is used to identify issues pertaining to the building, including a formal process to allow tracking of various key performance indicators (KPIs), such as critical equipment maintenance and critical building maintenance.

3.2.8 hazardous building materials management programme: A programme to identify and manage the presence and condition of hazardous building materials.

3.2.9 hazardous chemical products management programme: A programme to identify chemical products in use or storage in a building to manage health hazards and safety risks, as well as potential environmental impacts.

3.2.10 green cleaning programme: A programme that emphasizes the use of environmentally preferred products, maintenance of cleaning equipment and effective cleaning practices.

3.2.11 waste source separation programme: A programme that facilitates the separation of waste at the point of generation for recycling and waste destined for disposal.

3.2.12 waste audit: An audit to determine the categories and amounts of a building's waste streams.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AST	Above ground Storage Tank
CRD	Construction, Renovation or Demolition
ECM	Energy Conservation Measure
EUI	Energy Use Intensity
GHG	Greenhouse Gas
HVAC	Heating, Ventilation and Air Conditioning
IAQ	Indoor Air Quality
KPI	Key Performance Indicator
LED	Light-Emitting Diode
MERV	Minimum Efficiency Reporting Value
N/A	Not Applicable
PCA	Property Condition Assessment
PCB	Polychlorinated Biphenyl
SOP	Standard Operating Procedure
UST	Underground Storage Tank
WCM	Water Conservation Measure
WUI	Water Use Intensity

5 Conventions

None.

6 Sustainability performance of office building

6.1 General performance definition

The sustainability performance of an office building is directly connected to the building's utility consumption and the amount of waste it generates. Utility consumption in buildings, including energy use (e.g., heating, cooling, lighting, ventilation) and water use (e.g., cooling, irrigation, toilets and other uses), is the key determinant of a building's sustainability performance and its environmental footprint (i.e., greenhouse gas (GHG) emissions). The generation of waste within a building has a further impact on the environment, depending on the methods of disposal.

6.2 Application requirement

This Recommendation can be applied to any office building in the private or public sector.

6.3 How to apply the assessment

This assessment should be applied in two parts.

The first part consists of a series of best practices that should be implemented in every building. These best practices are proven strategies that generally do not require significant capital expenditure for implementation. They focus on improving the operation of a building, from setting sustainability related goals and targets, to formulating plans that improve the efficiency of building and the comfort level of occupants. By implementing the best practices described in this Recommendation, buildings will see a marked improvement in terms of energy and water efficiency, waste reduction and occupant satisfaction.

The second part consists of answering a series of questions that are linked to a scoring system. Each question has a predetermined point value if it is answered in the positive. The building team should count up the total points gathered (sum of the numerator value for each question) and the total points available (sum of the denominator value for each question) to get a final percentage score. All questions should be answered in order to get a valid assessment score. A higher percentage score indicates a higher-performing building. The initial percentage score from the assessment can be used as a baseline for future improvement. Reviewing questions where no points were awarded can also be a viable way to identify the potential areas for improvement of the building.

Questions that are answered as "not applicable" (N/A) should be excluded from the scoring.

Building management may wish to gather a diverse team representing all areas of building operations, maintenance and cleaning to develop the policies, practices, goals and targets that are applicable.

NOTE 1 – A tool will be available to assist in scoring.

NOTE 2 – In order to take full advantage of this Recommendation, building management may wish to have external confirmation of their progress undertaken at regular intervals.

7 Best management practices for office building

Clauses 7.1 to 7.8 contain best management practices related to key areas of environmental performance and management of office buildings, namely; energy, water, air, comfort, health and wellness, custodial, waste, and stakeholders.

List of all best practices

The 16 best practices in clauses 7.1 to 7.8 consist of a list of management policies, plans and programmes. They should be implemented as the first step to improve the sustainability performance of an office building.

7.1 Energy

Recommended best practice 1

A preventative maintenance programme should be implemented for buildings

Description: Preventative maintenance recognizes that certain systems and their components require scheduled periodic maintenance, as well as overhauling or replacement after a certain age, at certain intervals or due to specific causes. The preventative maintenance programme is a systematic approach that outlines which equipment under the landlord's control should be reviewed, the corrective action that should be taken and how frequently this should occur.

The preventative maintenance programme should outline when preventative and corrective maintenance is required to be performed on the building's equipment.

Records should be maintained.

Additional information: Preventative maintenance involves inspecting and testing units for their operational efficiency and responses to faults. Corrective maintenance involves repairing a unit to bring it back to operability at its most efficient capability.

Recommended best practice 2

A minimum level 1 (or equivalent) energy assessment should have been conducted within the last 5 years

Description: Level 1 energy assessment refers to a simple audit of a building's configuration and energy systems. It focuses on identifying the potential for energy efficiency improvements in a building.

Level 1 energy assessment should have been conducted on a building in the last 5 years.

The energy assessment report should contain the following elements.

- An analysis of energy consumption through monthly utility bill review and benchmarking. For benchmarking purposes, utility bills should cover a minimum of 12 months of continuous data. If major renovations or retrofits to the building systems have occurred, use the data after the time of major renovation. Major renovations include upgrades to mechanical, building envelope and electrical systems (e.g., the procurement of new lighting for more than 50% of the building's lighting fixtures).
- A list of the most energy-consuming equipment.
- A prioritized list of proposed low-cost and no-cost energy conserving measures (ECMs) to enable greater energy efficiency.
- Estimation of the financial savings the building owner will realize as a result of investing in ECMs. At a minimum, savings and cost estimates should be based on a generalized understanding of the systems.

See [ISO 50002] and [b-ANSI/ASHRAE/ACCA 211] for further guidance.

Recommended best practice 3

An energy management plan should be implemented for buildings

Description: Energy management is the continuous process of managing behavioural, organizational and technical change to improve a building's energy performance.

The energy management plan should have been reviewed and updated within the last 3 years.

The plan should identify a list of ECMs for the building (such as those provided in the energy audit, as available). For each initiative, identify the following:

- whether a particular ECM will be pursued;

- the person responsible for the implementation of the ECMs;
- the budgets associated with the ECMs; and
- a timeline for completion.

If a particular measure will not be followed-up for the building, indicate why this is the case.

Recommended best practice 4

Energy-reduction targets should be implemented for buildings

Description: Clear, long-term, outcome-oriented targets can help to shape expectations and create the conditions in which all actors have the confidence to develop solutions to common problems. By establishing targets and adopting relevant indicators, progress can be assessed, and appropriate actions can be taken.

An energy-reduction target should be identified along with a timeframe for completion.

Targets should be put in writing, signed by senior management and reviewed annually, and be integrated into the energy management plan.

Additional information: The energy-reduction target can be established to encompass either all utilities as a whole or divided into each type of utility (electricity, gas) under the control of the building management.

7.2 Water

Recommended best practice 5

A water assessment should have been conducted within the last 5 years.

Description: A water assessment refers to a simple audit of the building's configuration and water systems. It focuses on the identification of potential water-conserving measures.

A water assessment should have been conducted on the building within the last 5 years.

The water assessment report should contain the following elements.

- An analysis of water consumption through monthly utility bill analysis and benchmarking. For benchmarking purposes utility bills should cover a minimum of 12 months of continuous data
- A list of water-consuming equipment.
- A prioritized list of proposed low-cost and no-cost water conserving measures (WCMs) to enable greater water efficiency.
- Estimation of the financial savings the building owner will realize as a result of investing in WCMs.

Recommended best practice 6

A water management plan should be implemented for buildings

Description: Water management is the continuous process of managing behavioural, organizational and technical change to improve a building's water performance.

The water management plan should have been reviewed and updated within the last 3 years.

The plan should identify a list of water conservation measures (WCMs) for the building (such as those provided in the water assessment, as available). For each initiative, identify whether a particular WCM will be pursued, the person responsible for its implementation, the associated budget and a timeline for completion. If a particular measure will not be followed up for the building, indicate why this is the case.

The water management plan can be common to a portfolio or campus of buildings; however, implementation should be building specific.

7.3 Air

Recommended best practice 7

An indoor air quality monitoring plan should be implemented for buildings

Description: Improved IAQ is achieved through the selection of appropriate and achievable air quality goals, conducting regular surveillance and testing to verify HVAC performance and hygiene, identifying efficient and effective procedures for addressing occupant IAQ concerns, and conducting training for all property management and maintenance personnel.

The air quality monitoring plan should contain the following elements.

- Determination and statement of the IAQ goals for the building, including targets for air quality, parameters for measurements, such as carbon dioxide, carbon monoxide, temperature, relative humidity, dust, volatile organic compounds and other known contaminants of concern.
- Set a schedule for HVAC inspection and maintenance tasks to ensure good hygiene (e.g., cleanliness, no standing water).
- Identify HVAC systems that will impact the IAQ goals listed in the previous entries.
- Create a preventative maintenance schedule for these systems (may overlap with the preventative maintenance programme best practice). Equipment and systems should be checked at least annually.
- Develop procedures for responding to occupant IAQ concerns, including identifying key personnel and their responsibilities, contact information, documentation and follow-up plan (may overlap with occupant service request programme best practice).
- Identify training requirements for property management and building maintenance staff relating to IAQ.

Review the plan annually and update as necessary.

7.4 Comfort

Recommended best practice 8

An occupant service request programme should be implemented for buildings

Description: Service requests for maintenance are used to identify issues pertaining to the building. Having a formal process in place allows tracking of various KPIs, such as critical equipment maintenance and critical building maintenance.

Establish an occupant service request programme for the building. The programme should include the following components:

- a mechanism to ensure that all service requests are reviewed and acted upon within 1-2 weeks, unless otherwise specified (e.g., critical area or critical equipment);
- information on the origins of the service request;
- information on the status of the service request (e.g., in progress, resolved); and
- information on the corrective action taken.

Documentation should be kept on file for a minimum of 3 months. The occupant service request programme can be common to a portfolio or campus of buildings; however, implementation should be building specific.

Additional information: Service requests can be made by all building occupants, including tenants, visitors and staff.

7.5 Health and wellness

Recommended best practice 9

A hazardous building materials management programme should be implemented for buildings

Description: The presence and condition of hazardous building materials should be identified and managed for the safety of building occupants.

The hazardous building materials management programme should include:

- inventory of all building materials known or presumed to contain asbestos, lead, polychlorinated biphenyls (PCBs), silica and mercury (at a minimum);
- inspection of known or presumed asbestos-containing materials installed within the past 12 months, where present;
- inspection of materials or equipment known or presumed to contain lead, mercury, PCBs or other hazardous building materials installed within the last 3 years, where present;
- corrective actions identified during the inspections completed;
- management protocols for unexpected disturbance of asbestos;
- pre-construction assessment of materials and equipment impacted by renovation activities for the presence of hazardous building materials;
- a proactive plan for the abatement of accessible asbestos-containing materials (including in the areas above acoustic tiles) and PCB-containing equipment and ballasts;
- awareness training for building maintenance staff on asbestos safety;
- review and update as the location of hazardous materials changes in the building, at a minimum every 3 years.

As with any management programme, continuous improvement should be the goal. The management programme should be reviewed as changes to the responsibilities, personnel, plans, quantity or condition of the materials occur.

Recommended best practice 10

A hazardous chemical products management programme should be implemented for buildings

Description: The identification and management of chemical products in use or storage in a building is essential to manage health hazards and safety risks, as well as determining their potential environmental impacts.

The hazardous chemical products management programme should include:

- periodic inventory updates of in-use, base-building hazardous chemical products (at least annually or as procurement is revised);
- records on storage of chemical products in accordance with product safety data sheets;
- safety data sheets available for all hazardous chemical products dated within the past 3 years;
- chemical products labelled in accordance with the *Globally harmonized system of classification and labelling of chemicals* [b-UNECE GHS];
- training of building maintenance staff (including safe handling and use of chemicals pertaining to their work, symbol recognition, safety data sheets, first aid and spill response, storage and disposal);
- review and updating of the plan as products are changed and at least annually.