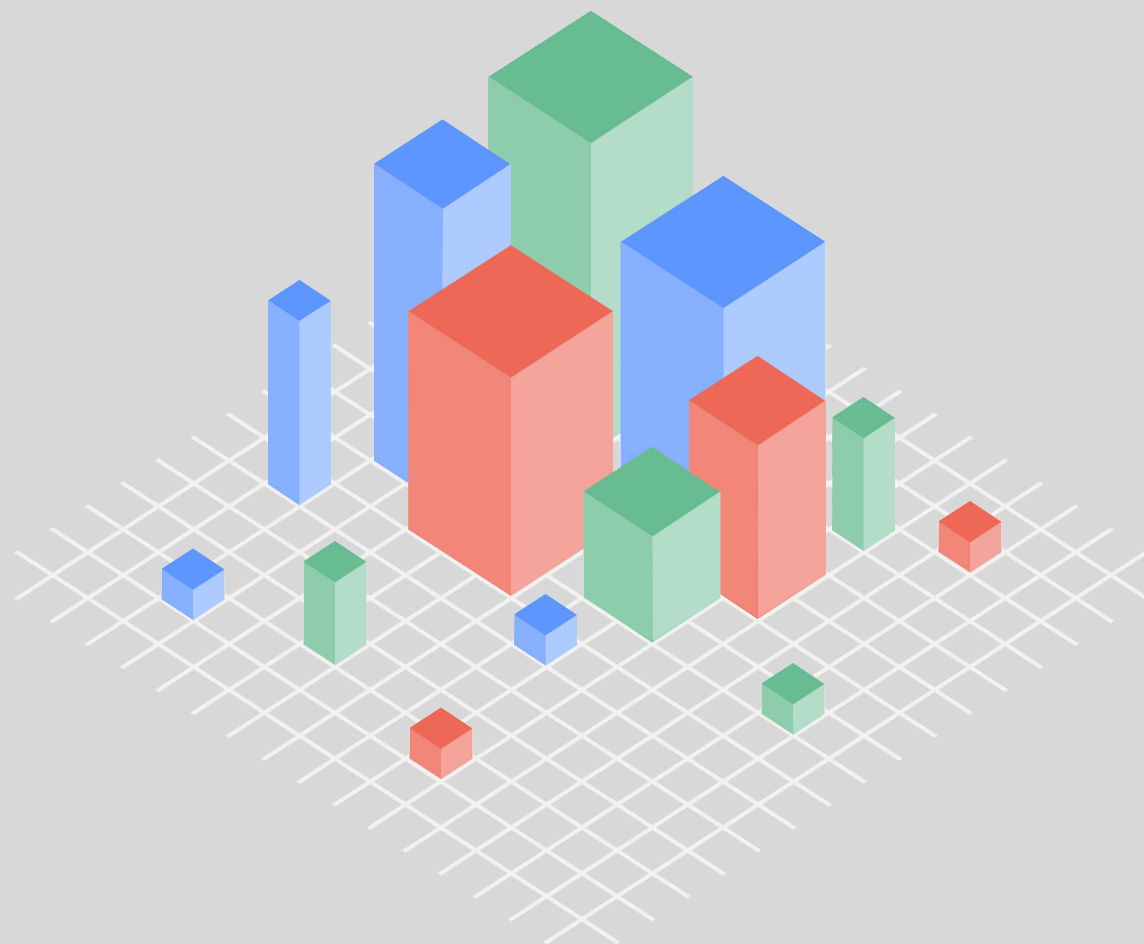


IDEAs

**Important and Desirable
Environmental Actions (IDEAs) for
Selection and Establishment of
Resilient and Efficient UN Offices
Benchmarks for Evaluation and
Comparative Analysis**



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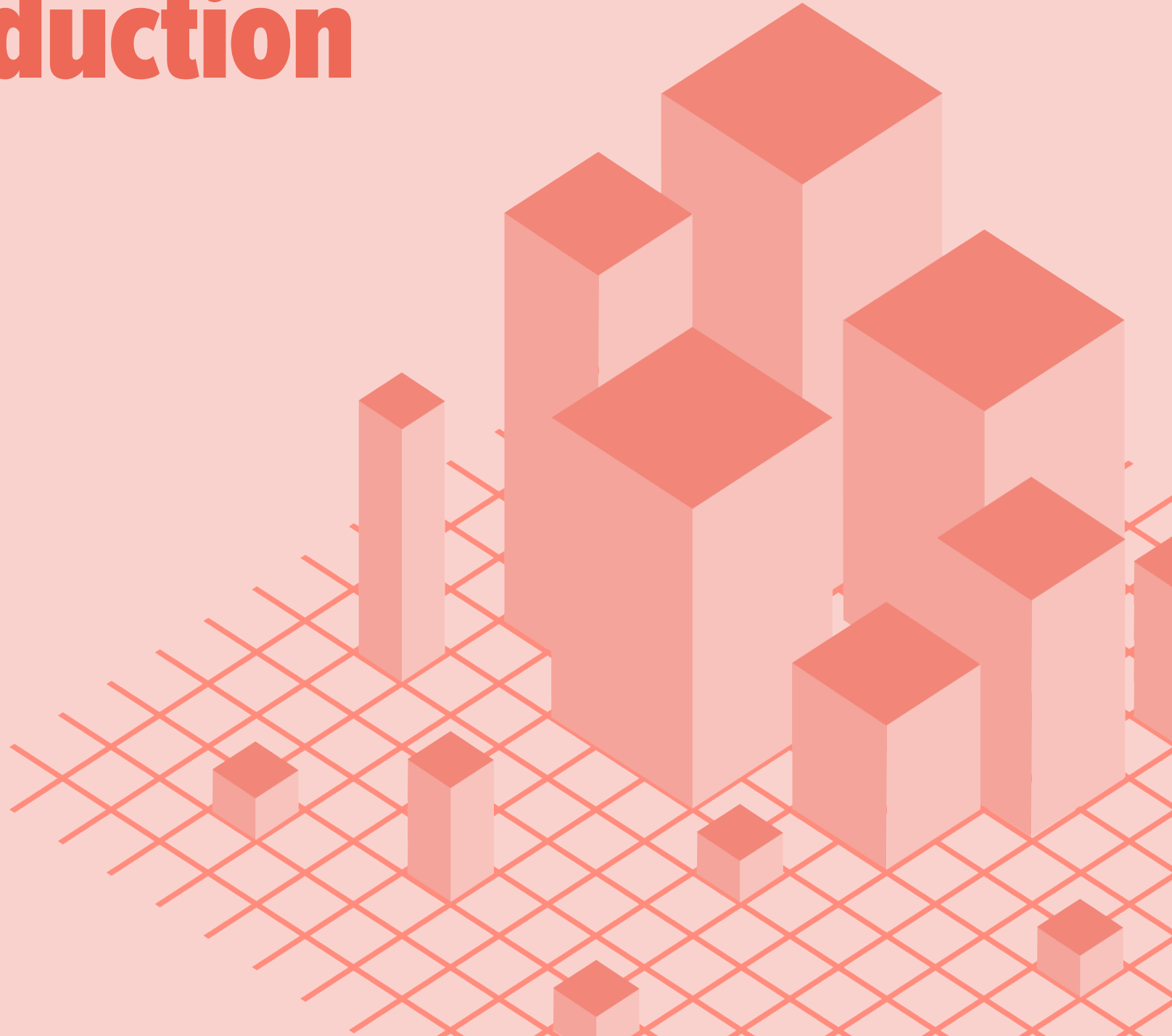
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1. Introduction



1. Introduction

1.1 Background

According to the UN's annual environmental inventory, office premises are responsible for the majority of the UN-system's environmental impacts associated with water consumption, waste generation and greenhouse gas (GHG) emissions¹. As such, UN offices play a significant role in the system-wide efforts to combat climate change and environmental degradation from within.

The adoption of the Strategy for Sustainability Management in the UN System 2020 – 2030² in 2019 was a major milestone in these efforts and a shift towards the most ambitious set of internal environmental targets to date, commensurate with the scale of the global climate and environmental emergencies³.

In addition to defining objectives and goals across more than 20 environmental aspects with over 30 associated targets, the Strategy calls on the UN system to align its practices with the recommendation of the International Panel on Climate Change (IPCC) to reduce GHG emissions from 2010 levels by 45 percent by 2030, reaching 'net zero' around 2050 in order to keep global warming within °C 1.5. Given the limited technological advances in air travel, buildings and associated facilities will likely have to deliver the bulk of the necessary savings.

Alongside the Strategy, the ongoing UN Reform⁴ is anchored in the idea of improving the credibility and effectiveness of the UN system in implementing the 2030 Agenda for Sustainable Development. While doing this, coherence between what is preached to member states

and pursued in UN programmes and the UN's business operations is key for credibility and good image of the organization.

One of the key components of the reform is the initiative to increase the proportion of UN common premises⁵ from 16% of all UN premises in 2017 to 50% by 2021⁶ in order to realize operational and financial efficiencies. The establishment of new common premises at this scale, by bringing several UN entities together within existing and new office buildings, offers an unprecedented opportunity to implement sound environmental actions from the outset and significantly contribute to the aforementioned corporate targets.

The need to better capitalize on this opportunity has been recognized within the recent review of common premises practices by the UN's Joint Inspection Unit (JIU)⁷. The review calls for deeper integration of environmental sustainability and efficiency gains together with modalities for tracking and reporting results, greater senior management accountability and the provision of necessary financial resources.

1.2 Defining a 'green' office

Leading private and public sector organizations typically rely on independent, third-party certification standards, such as LEED, BREEAM or equivalent (see Annex 2 for more information related to these standards), to define their sustainability aspirations and minimum requirements related to the buildings that they own, manage and/or occupy. One of the most important benefits of such standards is

that they enable policy makers to set a single overall performance target, such as LEED Gold or BREEAM Excellent, without the need to set dozens of targets and performance benchmarks for each topic addressed by the standards. Such an approach significantly reduces the time and resources needed to set performance standards and monitor their implementation while ensuring that performance is measured and independently verified against the latest scientific research on the topics that matter from energy use and occupant wellbeing to ecology and resource management. While the UN's Greening the Blue annual report refers to UN entities that have achieved green building certification for some of their buildings, these are typically limited to larger premises associated with headquarter locations, likely to account for less than 1% of the UN-occupied building stock⁸. Implementing green building standards across the UN office portfolio is still considered challenging due to the complex operational contexts and/or the lack of necessary resources identified in the aforementioned JIU report and frequently reported by UN entities' sustainability focal points.

Thus, defining a green office in the UN context is more complex than simply prescribing an internationally recognized green building rating. It currently requires a more flexible approach that considers factors such as operational context, lack of resources, and premises size.

1.3 Aims and Objectives

Against this background and with the overall goal to significantly reduce the environmental impact of newly established UN offices, IDEAs guidance aims to define an efficient and resilient office building or space in the UN context. It targets the earliest possible stages of office establishment from setting UN requirements as part of preliminary brief development and early cost-benefit analysis to development of detailed design briefs in the case of new construction, renovation and/or fit-out. Furthermore, it enables those involved in the selection of UN offices to communicate their environmental sustainability expectations to relevant stakeholders, such as host governments, landlords, design consultants and/or contractors, at the earliest opportunity. This is achieved by:

- Defining performance benchmarks, from minimum to desirable, across relevant environmental sustainability topics as defined within the 2020-2030 Sustainability Strategy.
- Promoting and facilitating comparative analysis of environmental performance between existing and a selection of potential new office premises.
- Promoting the inclusion of environmental considerations into the objectives associated with establishment and selection of UN offices.
- Providing a framework for reporting and tracking of facilities-related environmental performance.
- Promoting coherence and contribution to the 2030 Sustainability Agenda and the 2020 – 2030 Sustainability Strategy.

- Facilitating gap analysis of expected versus actual performance.
- Promoting a whole-life approach to cost-benefit analysis (e.g. by taking into consideration operational cost savings associated with capital investment in 'green' technologies).
- Integrating IDEAs into current processes for consolidation and establishment of common premises.

1.4 Scope

IDEAs can be used to benchmark a single UN office's performance and carry out a comparative analysis of several UN offices. It focuses on permanent² office buildings and spaces (i.e. floors and/or areas occupied by a UN entity within larger premises). The emphasis is on physical properties and site attributes, such as the type of building services installed or existing ecological features that can be influenced at the earliest possible pre-occupancy stage and thus provide a robust platform for sound environmental management during the occupancy stage. For example, in order to facilitate sound waste management during occupation, IDEAs focus on the presence of adequate waste storage area and the capacity of local waste infrastructure to manage expected waste streams and quantities, not on post-occupancy waste management procedures. Similarly, to enable sound energy management during occupation, the focus is on the provision of hardware such as meters and controls and not on day-to-day energy operation and management procedures. As such, IDEAs supplement ongoing UN-wide efforts that focus on environmental management such as the

commitment to implement ISO14001 or equivalent environmental management standards.

The earliest pre-occupancy stage varies depending on the type of new premises that are being established. Typically, the earliest pre-occupancy stage is the project briefing stage, followed by early feasibility and cost-benefit analysis. In the UN context, the new premises are established under one of the following scenarios:

- Host government or authority-provided (often rent-free) building or space
- Leased office space or building from a private or public sector entity
- UN-owned building or space

Under any of the stated scenarios, the buildings/spaces could be either:

- Existing and ready for occupation
- Existing requiring a degree of renovation (e.g. fit-out only or fit-out and new core building services) prior to occupation
- Newly designed and constructed

In terms of environmental topics, IDEAs cover the following:

- Energy and GHG Emissions
- Solid Waste Management
- Health and Wellbeing
- Water and Wastewater Management

- Biodiversity
- Sustainable Procurement

1.5 Target Audience

The primary target audience is the environmental sustainability professionals and focal points within UN entities responsible for defining corporate environmental objectives, their implementation and monitoring.

Depending on the project type and complexity, the guidance can be used by non-technical personnel to identify areas where additional support may be needed, including from external entities involved in the selection and establishment of new premises. For example, non-technical UN personnel can either use a selected text from the technical guidance to set specific requirements as part of the project brief or share the whole document and refer to a desired level of performance.

-
1. Greening the Blue Report 2020, UNEP; <https://tinyurl.com/4stxtst2>
 2. Strategy for Sustainability Management in the UN System 2020-2030, Phase 1: Environmental Sustainability in the Area of Management; CEB/2019/3/Add.2 <https://tinyurl.com/4n5ppnmn>
 3. Remarks by the UN Secretary-General at the Climate Ambition Summit, December 2020; <https://tinyurl.com/zbcnfecr>
 4. UN Secretary – General’s Proposals for the Reform of the United Nations; <https://tinyurl.com/ww3dtfa4>
 5. Premises occupied by two or more UN entities.
 6. UN Development System Repositioning Explanatory Note No4; February 2018; <https://tinyurl.com/4hyvpneu>
 7. Common premises in the United Nations system: current practices and future prospects; UN Joint Inspection Unit (JIU) report, JIU/REP/2020/3; <https://tinyurl.com/ddje3vv9>
 8. There is currently no accurate data on the total number and characteristics of UN occupied buildings. The most comprehensive data is held by the UN Department of Safety and Security, and according to its 2017 analysis of 42 UN entities that are members of the UN Sustainable Development Group, the total number of premises is approximately 3,000.
 9. Includes fixed structures that cannot be moved from one location to another with a typical design life for main building elements of 60 years.
-

2. User Instructions



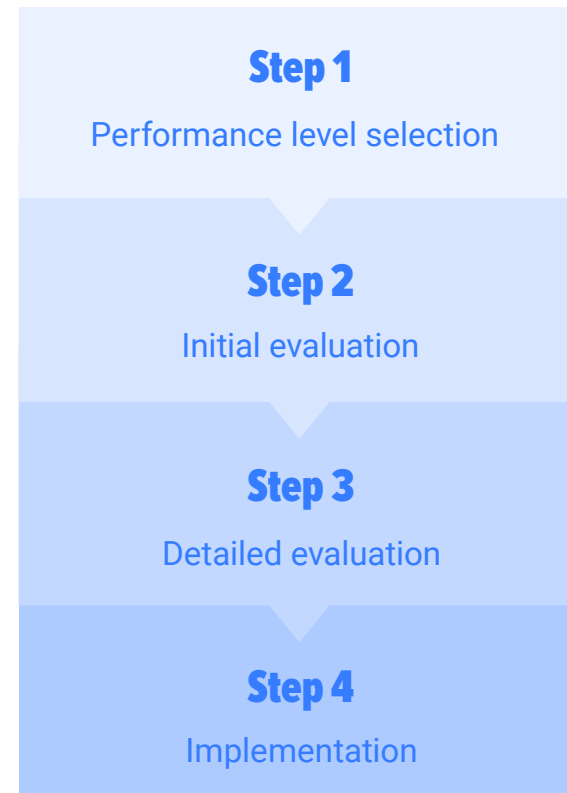
2. User Instructions

The way this guidance is used in practice will depend on one or more of the following factors:

- Complexity and size of the office building or space being evaluated
- Technical capacity of personnel using the guidance
- Availability of financial and human resources
- Operational context of the location including but not limited to safety, security, real estate market conditions, political sensitivities, maturity of the property/construction sector and associated supply chains
- Availability of tools designed to facilitate evaluation, benchmarking and comparative analysis as well as tools aimed at implementation of more complex technical aspects¹⁰
- Type of use (i.e. as guidance only or as a basis for the development of a performance tracking and reporting tool)

2.1 Implementation Steps

The guidance would typically be implemented in the following order:

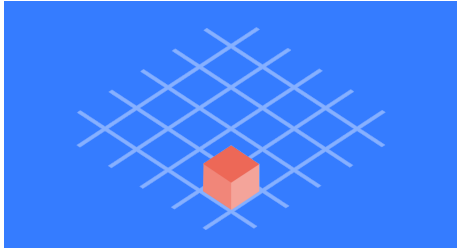


Step 1 – Performance Level Selection

As mentioned above, the most robust approach for evaluating and ensuring good sustainability performance of office buildings is to assess and certify them against one of the leading international green building standards. Within this guidance, such an approach is referred to as Level 4 performance (see text below, Table 1 and Annex 2 for further information).

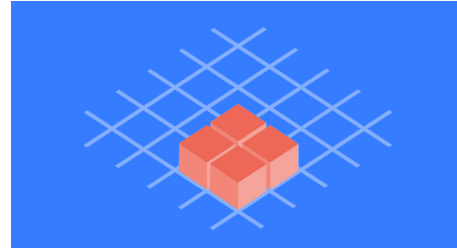
In the UN context, doing such assessments and certification may not always be practical or viable due to the premises type (e.g. area within a governmental building; residential apartment; small size) or operational context (e.g. safety, security, resources, market conditions).

With that in mind and where Level 4 performance is not considered to be practical or viable, IDEAs define three additional performance levels (i.e. Level 1 to Level 3) as described in the text below and summarized within Table 1 on page 12 of this document.



LEVEL 1 – MINIMUM PERFORMANCE (UN OFFICES UNDER 1,000m²):

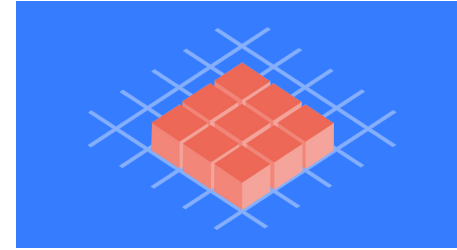
Any newly selected/established office building or space under 1,000m² should aim to reach all of the Level 1- Minimum Performance requirements outlined under Heading 3 – Detailed Technical Guidance and summarized within Annex 1 - Level 1 Checklist. Where this is not possible due to a complex operational context, for example, the reasons for not meeting specific Level 1 aspects should be documented and an adequate mitigation strategy developed.



LEVEL 2 – IMPORTANT PERFORMANCE (OFFICES 1,000m² to 4,999m²):

While all offices, regardless of size, should strive to implement as many of the Level 2 – Important Performance requirements (see Heading 3 – Detailed Technical Guidance) as possible, this performance level primarily targets medium-sized offices of between 1,000m² and 4,999m².

Such offices should aim to achieve all of the relevant Level 2 performance requirements in addition to Level 1 requirements and be subject to limitations due to the operational context. Aspects that are challenging to achieve should be adequately documented, and mitigation strategies developed.



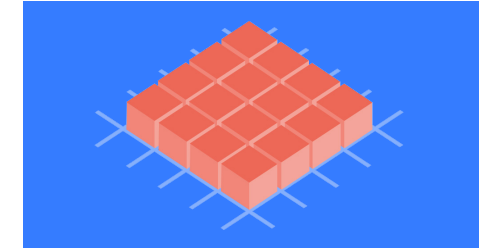
LEVEL 3 – DESIRABLE PERFORMANCE (OFFICES 5,000m² to 10,000m²):

All offices, regardless of size, should strive to implement as many of the Level 3 – Desirable Performance requirements (see Heading 3 – Detailed Technical Guidance) as possible. However, this performance level primarily targets larger offices, between 5,000m² and 10,000m², where certification against international green building standards such as BREEAM and LEED or their local equivalents is not considered practical and/or viable.

Such offices should aim to achieve all of the relevant Level 3 performance requirements in addition to Level 1 and 2 requirements, subject to limitations due to the operational context. Aspects that are challenging to achieve should be adequately documented, and mitigation strategies developed.

The stated green building standards and their equivalents have been in use since the early 1990's and buildings have been certified in most countries and territories around the world, including locations with UN field missions.

The certification's practicality and/or viability should be evaluated by the relevant green building certification standard expert such as a LEED Accredited Professional or a BREEAM Licensed Assessor or equivalent.



LEVEL 4 – DESIRABLE PERFORMANCE (OFFICES 5,000m² and MORE):

Any UN office between 5,000m² and 10,000m² should aim to achieve a BREEAM rating of 'Excellent' or LEED rating of 'Gold' or equivalent, as a minimum, unless Level 3 performance criteria selection is justified.

Any UN office over 10,000m² should aim to achieve a BREEAM rating of 'Excellent' or LEED rating of 'Gold' or equivalent as a minimum.

Detailed technical requirements associated with Level 4 are not included in this document as each relevant standard comes with its own detailed technical criteria. For further information on Green Building Standards see Annex 2.

Step 2 – Initial Evaluation

For offices that are less than 5,000m², the initial evaluation should include a quick analysis of existing (if considered) and potential new office premises using Level 1 Checklist (see Annex 1) or equivalent entity/context-specific tool(s) based on IDEAs (see Heading 3 – Detailed Technical Guidance). Aspects that require additional information and/or technical input (if any) should be identified within the checklist and addressed during Step 3 - Detailed Evaluation.

For offices that are over 5,000m², a pre-assessment against an international green building certification standard should be conducted by a suitably qualified expert.

When considering more than one office, the best performing one should be selected for Step 3 – Detailed Evaluation.

Step 2 should be implemented at the earliest opportunity and form part of project brief development, optioneering and/or pre-feasibility or feasibility stage cost-benefit analysis.

Step 3 – Detailed Evaluation

The focus of detailed evaluation is on the building or space selected under Step 2 - Initial Evaluation.

The scope of detailed evaluation will depend on the selected performance level under Step 1.

Levels 1 to 3 evaluation will rely on the detailed technical criteria outlined under Heading 3 of this document, while Level 4 evaluation will be guided by the technical criteria outlined within the chosen green building certification standard (see Annex 2 for further information and links).

In any case, detailed evaluation should be used as the basis for developing an action plan aimed at implementing relevant technical requirements.

Detailed evaluation should be carried out at the earliest possible opportunity to ensure that relevant requirements are integrated within relevant contracts/agreements, and there is commitment and resources to implement them. Depending on the project type, such an early stage could be concept design development or signing contracts/agreements with relevant stakeholders.

Step 4 – Implementation

Having prepared an action plan that is based on detailed evaluation under Step 3 and includes relevant responsibilities and timeframes, Step 4 should focus on its implementation.

Level 4 approach offers a structured approach promoted by an organization that operates the relevant green building standard and is supported by suitably qualified, third-party experts. Such a process typically includes technical support, performance tracking, collection of evidence and final inspection of implementation prior to certification.

Where Levels 1 to 3 are selected, a similar mechanism, whereby performance is systematically monitored and verified and necessary technical support provided, should be put in place.

Detailed evaluation and the action plan should be updated at the end of the project (e.g. fit-out, refurbishment, construction) and prior to occupancy by UN entities in order to document both the achievements and reasons for the lack of implementation if any.

IDEAs' Recommended Performance Levels Overview





	 Level 1	 Level 2	 Level 3	 Level 4
Gross floor area	<1,000m ²	1,000m ² – 4,999m ²	5,000m ² to 10,000m ²	5,000m ² and more
Location Context	Anywhere subject to operational context		Where Green Building Certification is not viable	Anywhere, unless Level 3 performance criteria met
Performance Target	100% Level 1 Criteria	Level 1 + Level 2 Criteria	Level 2 + Level 3 Criteria	LEED Gold, BREEAM Excellent or equivalent
Weighting	Technical guidance considers location and operational context			Integral to standards
Who	Facilities/project management team with support from an environmental expert (UN or external); client representative			Accredited Professional (AP); Licensed Assessor
Requirement	Commitment to meet targeted performance level within one or more of the following documents or equivalents: Detailed Brief of UN Requirements; Cost-Benefit Analysis; Memorandum of Agreement (MOA) between the UN and the host government; Inter-agency Memorandum of Understanding (MOU); Green Lease Agreement between the UN and landlord			In addition to commitments, LEED, BREEAM or equivalent pre-assessment report for new construction or certificate for existing
Accountability	Project leader (e.g. UN Resident Coordinator, Head of Mission); Task Team on Common Premises (via Review and Endorsement)			

Table 1. Recommended Performance Levels

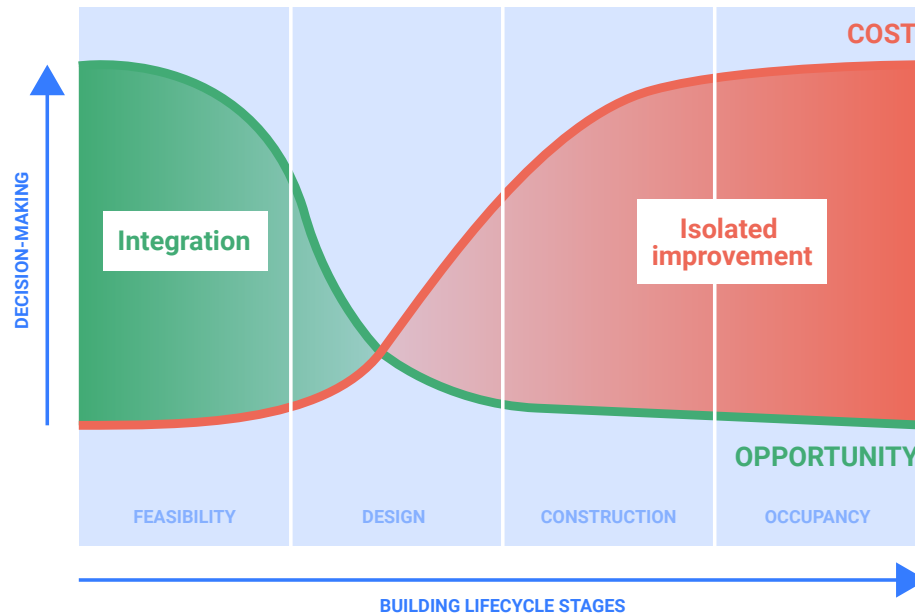


Figure 1: When to engage with environmental sustainability (courtesy of BRE)¹²

2.3 Implementation – Timing and Technical Expertise

The establishment of new premises will always involve a degree of planning and design as well as the establishment of new agreements and contracts regardless of whether it is a construction of a new building or the leasing of an existing one. This ‘fresh’ start offers a unique opportunity to address and embed sustainability considerations from the outset (i.e. during project briefing and feasibility stages) in a cost-effective manner.

Despite a popular belief that ‘green’ buildings cost more, current research shows ‘that building green does not necessarily need to cost more, particularly when cost strategies, program management and environmental strategies are integrated into the development process right from the start¹¹. Figure 1 illustrates this point in terms of cost, opportunity and the likelihood of integration of improvements at different stages of a building’s lifecycle. It shows that decisions taken during later stages of a building’s lifecycle result in isolated improvements due to rising costs and reduced opportunities.

2.2 Implementation Tools and Evaluation Techniques

Given the wide range of operational contexts and office types being established, the development of specific tools and evaluation techniques is beyond the scope of this guidance document. Organizational sustainability focal points can use this guidance to develop new tools or inform and expand their existing evaluation tools. When doing so, they may consider the following aspects:

- Scoring and environmental section weighting to ensure emphasis on the most important environmental aspects (e.g. climate change, biodiversity and air pollution)
- Scoping out of aspects that are not applicable
- Defining mandatory aspects (e.g. provision of energy meters or wastewater treatment)
- Comparative assessment vs one-off evaluation
- Integration with existing tools (e.g. for cost-benefit analysis or bid evaluation)

While IDEAs aim to simplify sustainability requirements, the level of detail presented within Heading 3 – Detailed Technical Guidance may seem daunting, particularly to those who do not have a background or expertise in green building practices. Therefore, it is essential that UN personnel responsible for establishment and selection of office premises, particularly the larger ones, identify and secure adequate technical support from the project outset. This could be achieved by, for example, including relevant sustainability requirements within project briefs and requests for proposals. In such instances, a requirement to achieve a particular IDEAs performance level could be specified together with reference to detailed technical guidance presented in this document.

If project teams do not benefit from having an external consultancy firms on board or are unable to procure firms with adequate expertise, they should contact their own organization's sustainability focal point for further guidance and support. A full list of UN entity focal points can be accessed here:

www.greeningtheblue.org/contacts

Additional guidance can also be sought from the Sustainable UN (SUN) facility at UN Environment Programme (UNEP), who coordinates the UN-wide Issue Management Group on Environmental Sustainability Management info@greeningtheblue.org

-
10. For example, UN SDG's Task Team on Common Premises (TTCP) will promote the use of an environmental scorecard, based on IDEAs, as part of early cost-benefit analysis when selecting and/or establishing new common office premises.
 11. Business Case for Green Buildings, World Green Building Council, 2013 <https://tinyurl.com/vya7m6ju>
 12. The graph was prepared by the BRE (UK's Building Research Establishment) using real building data.
-

3. Detailed Technical Guidance



3.1

Energy and Greenhouse Gas Emissions (EGE)



Issues addressed:

- EGE 01 – Energy and Carbon Intensity
- EGE 02 – Energy and Carbon Efficiency
- EGE 03 – Energy Measuring and Monitoring
- EGE 04 – Ground Travel

UN Sustainability Strategy 1:

- Percentage reduction in energy consumption
- Percentage reduction in environmental impacts from facilities
- Percentage of UN system -reported unavoidable GHG emissions that are offset
- Percentage of renewables
- Percentage reduction in fuel use from ground transport
- Percentage of electric vehicles
- Percentage fuel in use that meets international quality standards

Benefits:

- Environment, Cost, Resilience, Reputation, Local Business Support, Health and Wellbeing

SDG Contribution:

- SDG Goal 3: Ensure healthy lives and promote well-being for all at all ages
- SDG Goal 7: Ensure access to affordable, reliable, sustainable and modern energy
- SDG Goal 13: Take urgent action to combat climate change and its impacts



EGE 01 Energy and Carbon Intensity

Context:

2020-2030 UN Sustainability Strategy commits the UN system to reduce greenhouse gas (GHG) emissions by 45% by 2030 in line with IPCC recommendation to keep global warming within °C 1.5. For the majority of UN entities, this reduction will be realized through efficiencies associated with UN facilities. The focus on facilities is due to two key factors: 1) Facilities are responsible for the largest proportion of UN emissions (i.e. 46% in 2018), and 2) Facilities currently offer a much greater opportunity (in terms of technological advancements) for emission reductions than air travel.

While each UN entity is expected to develop an entity-specific Climate Action Plan (CAP) to meet this ambitious target, the establishment of new premises (through leasing, renovation or new construction) offers a unique and cost-effective opportunity to support this transition. This can be achieved by either occupying buildings that are already energy-efficient and low carbon or by achieving efficiencies through renovation and new construction.

Criteria:



Minimum

M1a: Select premises with lower Energy Use Intensity (EUI) measured in kWh/m² of gross floor area and lower Carbon Intensity (CI) measured in kgCO₂eq/m² than those of your existing premises in the same location or local baseline, whichever is lower **OR**

M1b: If unable to establish EUI and CI due to the lack of reliable billing/metering data, ensure that the minimum energy efficiency criteria under EGE 02M1 and M2 is achieved.

M2: If relevant, select premises that comply with your entity's Climate Action Plan (CAP)¹³.



Important

I1: Select premises with EUI at least 20% lower and CI at least 45% lower than your existing premises in the same location or local baseline, whichever is lower.



Desirable

D1: Select premises with low EUI typically associated with net-zero carbon offices in your climatic region¹⁴ and with net-zero CI.

Net-zero carbon should not rely on purchasing carbon offsets and/or Renewable Energy Certificates (RECs) but should be achieved by on-site or near-site renewables directly connected to the building.

Guidance:

EUI and CI are used to normalize energy and carbon data in order to enable comparative analysis. Normalization by floor area is the most common approach when comparing building performance. For the comparative analysis to be credible, it is important to apply the same definition/approach when calculating total energy consumption, related carbon emissions and gross floor area (GFA).

Regarding energy consumption of potential UN offices, a comparative analysis can be made using either actual operational energy used or estimated/ modelled energy consumption. Comparison based on the actual operational energy can be made for existing buildings with reliable and complete energy consumption data from utility bills, energy meters and/or fuel receipts. The data should cover the most recent 12 months of building operation under normal/expected occupancy. If no reliable data is available or the building being evaluated is new or newly refurbished, then the comparison needs to be made based on modelled performance.

Modelled energy performance typically estimates the regulated energy consumption resulting from the specification of controlled, fixed building services and fittings, including space heating and cooling, hot water, ventilation, fans, pumps and lighting. It does not account for the unregulated energy consumption associated with equipment and appliances' plug-in loads, lifts, server rooms and similar as it is challenging to predict. At the same time, the unregulated energy in a single building could amount to as much energy as the regulated energy. Thus, when comparing and benchmarking the performance of different buildings for the purposes of EGE 01 issue, it is

important to only compare actual with actual and modelled with modelled energy performance.

Modelling of energy performance is a complex technical undertaking and should be undertaken by a suitably qualified professional such as a building physicist or a building services engineer. In addition to complex dynamic modelling software, there are also simplified modelling tools that could be utilized. One such tool, called EDGE¹⁵, developed by the International Finance Corporation (IFC) can be used to predict regulated energy consumption and compare it against local baselines. Both existing and new buildings can be assessed, and while the tool is free of charge, appointing an 'EDGE Expert' is highly recommended.

Another online tool that can be utilized for simplified modelling and comparison against best international practice in the local climatic context is BREEAM In-Use¹⁶. BREEAM In-Use can facilitate modelling of the regulated energy performance of both existing and new buildings, as well as a comparative analysis of operational energy based on actual consumption by existing buildings.

While both EDGE and BREEAM facilitate certification of net-zero carbon buildings, EDGE definition of net-zero carbon is less rigorous than IDEAs' requirement as it allows for carbon offsetting.

Carbon and Energy conversion factors used in calculation and modelling of EUI and CI must originate from credible sources such as the International Energy Agency. Individual entity's sustainability focal points should be able to advise on suitable conversion factors for different sources of energy and locations.

Regarding Gross Floor Area, it typically includes the whole enclosed area of a building within the external walls taking each floor into account, excluding the thickness of the external walls, open balconies, open garages, and open-sided areas. The following international standards define Gross Floor Area:

- Code of Measuring Practice (RICS)
- International Property Measurement Standards (IPMSC)
- A Unified Approach to Measuring Office Space (BOMA and IFMA)

Any of the above standards can be used as long as they are used consistently.

-
- UN Secretariat's CAP <https://tinyurl.com/jh2bnda6>
 - According to the UK Green Building Council, the typical EUI of a net-zero carbon building is 55KWh/m²; <https://tinyurl.com/7698pajv>
 - <https://edgebuildings.com/>
 - <https://www.breeam.com/discover/technical-standards/breeam-in-use/>
-

EGE 02 Energy and Carbon Efficiency

Context:

Ideally, the UN would be leasing existing or constructing new buildings that are energy efficient and net-zero carbon. In reality, however, the choice is often limited to buildings that do not meet minimum energy and carbon requirements (this can be accompanied by shortcomings related to other important requirements such as security, building standards or operational health and safety). In such cases, the only option may be to upgrade buildings to the required EUI and CI performance levels. Therefore level 1 criteria are designed to enable zero and low-cost opportunities to be integrated in locations where such opportunities may be limited due to operational context.

Identifying necessary upgrades and associated cost estimates should form part of the business case analysis prior to leasing, renovating or building new offices. In addition, it is important that there is a contractual commitment to implement recommendations from such analysis within lease agreements, design briefs, Memorandums of Understanding/Agreements and other relevant official documents.

While analysis is particularly important where buildings do not meet the minimum standards identified under EGE 01 issue above, it is encouraged in all contexts.



Criteria:



Minimum

M1: Select an office that includes at least four of the following passive design features:

- Optimal building orientation
- Roof insulation
- Double-glazing with low-E coating
- Wall insulation
- Natural ventilation
- Optimal shading
- Access to daylight
- Thermal mass
- Airtight building envelope
- Other not specified above

M2: Select an office that includes at least two of the following building services and controls features:

- LED internal and external lighting
- Lighting connected to daylight and presence sensors and/or separate lighting zones
- Appropriately sized and energy-efficient inverter type split and/or multi-split air conditioning (AC) units or no ACs

- Efficient boiler for space heating and hot water (minimum 90% efficiency)
- Adequate thermal zoning and controls
- Renewable energy technologies
- Energy-efficient data centres/ server rooms
- Other not specified above

M3: Procure grid electricity from a renewable and/or low carbon supplier whenever possible.

M4: If relevant, obtain written commitment (i.e. within lease agreements, contract documents, RFPs, MOUs, MOAs and similar) from relevant stakeholder(s) (e.g. landlord, developer, contractor, design team, UN entity) to implement relevant energy and carbon efficiency measures.



Important

I1: Commission / request an independent energy audit/energy efficiency analysis (in terms of life-cycle cost, payback and ease of implementation) for each potential building under consideration and identify cost-effective measures needed to meet EUI and CI targets.



Desirable

D1: In addition to Level 2 requirements, the scope of analysis should also include:

- Life-cycle cost analysis with payback
- Energy and carbon savings of each measure
- Local context analysis (e.g. market conditions, planning restrictions)
- Available local, regional or UN grants
- Consideration of all measures and technologies suitable
- Reasons for excluding measures and technologies
- Power Purchase Agreements (PPAs) with renewable energy generators
- Recommendations for achieving targeted desirable EUI and zero net CI

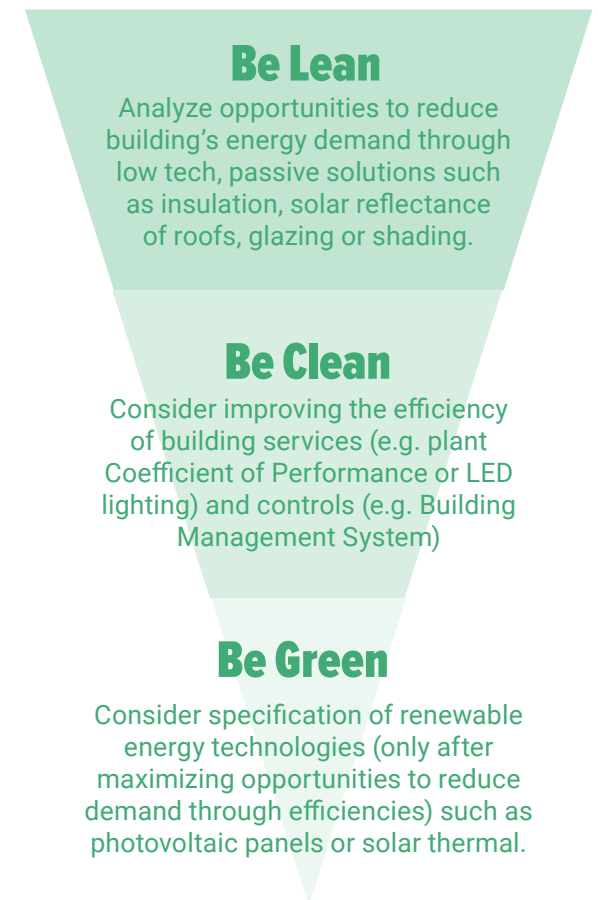
D2: Ensure contractual commitment to carry out regular post-occupancy audits at 5-yearly intervals.

Guidance:

Level 1 requirements are intended to accommodate the self-assessment of small offices by non-technical UN staff involved in selecting and establishing new offices. Different passive design and building services features should be evaluated in the context of the local climate. For example, in hot climates, buildings need to be oriented to minimize solar gain and reduce cooling load. At the same time, in climates with hot summers and cold winters, a combination of building orientation and shading needs to maximize the heat gain in winter and minimize it in summer.

Provision of energy-efficient LED lighting and inverter type split AC units alongside improved controls and energy monitoring infrastructure are among the most common recommendations from energy audits of UN buildings. When considering LED light fittings, consideration should be given to the difference between LED-integrated fixtures and LED-ready fixtures (e.g. a screw-on bulb). The former is significantly more energy-efficient and lasts longer, but the initial investment is higher. Appropriately sized inverter-type AC units perform best at 50% loads and achieve Coefficients of Performance (COPs) of 4.6 (typical inverter type units) and 7.0 (very efficient types), which are significantly higher than COPs of 2.6 (older) and 3.3 (newer) associated with traditional AC units.

The energy audits associated with Level 2 and Level 3 performance criteria should be carried out by suitably qualified professionals in line with the 'BE LEAN - BE CLEAN - BE GREEN' energy hierarchy as follows:



Renewable energy should be considered in the following order of priority:

- on-site generation,
- off-site generation with direct link,
- off-site purchase (i.e. through PPA)
- purchase of Renewable Energy Certificates (Green-E certified or equivalent).

In terms of commissioning and financing energy audits and associated recommendations, the relevant UN personnel should follow the hierarchy described under each of the following four potential scenarios.

Scenario 1 (Third-party ownership):

Select an office that does not require improvement to meet EGE 01 criteria prior to UN occupancy. The compliance with criteria should be based on robust evidence (e.g. metered energy consumption, 12-months utility bills, third-party modelling) AND (for Level 3 performance only) ensure implementation of either option A or B below:



- A.** The landlord (e.g. commercial entity, host government, private landlord) commits (e.g. via a clause in the lease agreement) to:
- i.** Financing regular and independent post-occupancy energy audits at 5-yearly intervals starting 12 months after initial UN occupation **AND**
 - ii.** Implementation of zero and low-cost recommendations.

OR

- B.** Where the landlord is not able to finance either audits or implementation of audit recommendations or both, ensure contractual commitment from the landlord to:
- i.** Allow UN-financed, regular and independent post-occupancy energy audits at 5-yearly intervals starting 12 months after initial UN occupation
 - ii.** Allow UN-financed implementation of audit recommendations
 - iii.** Guarantee financial savings from implemented improvements either through reduced rent (i.e. in case of gross lease) or reduced energy costs (i.e. net lease)



Scenario 2 (Third-party ownership):

Where the potential offices being considered do not meet EGE 01 criteria, assessed using robust evidence prior to UN occupancy then, select an office that is closest to meeting the EGE 01 criteria AND ensure implementation of either option A or B below:

- A.** The landlord (e.g. commercial entity, host government, private landlord) commits (e.g. via a clause in the lease agreement) to:
- i.** Financing an independent, pre-occupancy energy audit **AND (for Level 3 only)** regular 5-yearly post-occupancy audits
 - ii.** Implementation of recommendations necessary to meet the EGE 01 criteria **AND (for Level 3 only)** implementation of zero and low-cost recommendations associated with regular post-occupancy audits

OR

- B.** Where Scenario 2Ai and/or 2Aii is not possible, ensure contractual commitment from the landlord to:
- i.** Allow UN-financed, independent pre-occupancy energy audit
 - ii.** Allow UN-financed implementation of pre-occupancy audit recommendations to meet the EGE01 criteria

AND (for Level 3 only)

- iii.** Allow UN-financed, regular and independent post-occupancy energy audits at 5-yearly intervals
- iv.** Allow UN-financed implementation of zero and low-cost post-occupancy audit recommendations
- v.** Guarantee financial savings (i.e. payback) from implemented improvements either through reduced rent (i.e. in case of gross lease) or reduced energy costs (i.e. net lease)



Scenario 3 (UN Ownership):

Select an office that does not require improvement to meet EGE 01 criteria prior to UN occupancy. The compliance with criteria should be based on robust evidence (e.g. metered energy consumption, 12-months utility bills, third-party modelling)

AND (for Level 3 only)

Ensure financial commitment (i.e. within MOUs/MOAs/budget lines) from the occupying UN entity/s to conduct regular post-occupancy energy audits at 5-yearly intervals starting 12 months after initial UN occupation and implementation of zero and low-cost recommendations.



Scenario 4 (UN Ownership):

Where Scenario 3 is not possible, select an office closest to meeting EGE 01 criteria prior to UN occupancy, assessed using robust evidence, and ensure:

- A. Financial commitment (i.e. within MOUs/MOAs/budget lines) from the occupying UN entity/s to conduct an independent, pre-occupancy energy audit **AND (for Level 3 only)** regular 5-yearly post-occupancy audits

AND

- B. Implementation of recommendations necessary to meet the EGE 01 criteria **AND (for Level 3 only)** implementation of zero and low-cost recommendations associated with regular post-occupancy audits.

EGE 03 Energy Measuring and Monitoring

Context:

Energy meters and sub-meters provide information regarding actual overall energy consumption as well as energy consumption from different end uses (e.g. heating, lighting, equipment) and by different building areas or departments, which is essential to evaluating the performance against targets and identifying opportunities for in-use energy reduction.

The cost of energy metering and monitoring infrastructure has significantly reduced in recent years with advances in internet-connected smart metering technologies that allow remote monitoring of energy consumption. 'Green Kits' containing remote energy monitoring devices and provided as part of WFP's Energy Efficiency Programme are a good example of what can be achieved¹⁷.

17. <https://innovation.wfp.org/project/green-kit>

Criteria:



Minimum

M1: Select premises with energy meters that facilitate the measurement of all electrical and non-electrical energy consumption.



Important

I1: Select premises with energy meters with pulsed output (i.e. digital) that facilitate measurement of all electrical and non-electrical energy consumption.

I2: If procuring common premises, ensure the presence of energy sub-meters to facilitate energy consumption monitoring by each UN entity.



Desirable

D1: Select premises with comprehensive energy metering and monitoring infrastructure (e.g. Building Management System) to facilitate a high level of energy management.

The infrastructure should facilitate measurement and monitoring of energy consumption by different end-uses (e.g. space heating, space cooling, lighting, ventilation, plug-in equipment, renewables etc.)

EGE 04

Ground Travel

Context:

Site selection significantly impacts greenhouse gas emissions related to ground travel including staff commuting visitor and business travel. Subject to meeting security and safety standards, sites centrally located within close proximity of residential areas and public transport links are likely to result in significantly lower GHG emissions.

Given the variety of locations that the UN operates in, the key focus of this issue is to understand the needs of building occupants in the context of local opportunities for low impact transport following the transport hierarchy approach and challenges such as security, road safety or existing transport infrastructure.

Criteria:



Minimum

M1: Wherever possible and subject to UN Department of Security and Safety (UNDSS) assessment and approval by the Designated Official (DO), choose a site in close proximity to staff residential areas, major transport links (i.e. airports, bus and train stations), amenities (e.g. schools, restaurants or shops) and other UN and governmental entities.



Important

I1: Conduct a survey to understand transport needs of future building occupants in terms of commuting (i.e. where they live and preferred mode of transport), access to amenities (e.g. banks, schools, restaurants, shops) and business/mission travel.;

I2: Subject to UNDSS assessment and approval by the DO, choose a site with good opportunities for implementation of safe, sustainable transport modes, such as walking and cycling, including:

- Close proximity (i.e. within 500m) to frequently served public transport nodes (i.e. bus/tram stops and train stations)
- Close proximity (i.e. within 500m) to amenities such as shops, restaurants/cafes, banks, recreational facilities, schools etc.
- Cyclists facilities including safe storage, showers, changing rooms, lockers
- Electric vehicle charging points and priority parking



Desirable

D1: Commission an expert (e.g. transport consultant) to carry out a comprehensive transport assessment for potential site(s) that considers the following:

- Existing/predicted travel patterns
- Opinions/risks/opportunities regarding cycling and walking
- Existing cycling/walking environment
- Inclusive access
- Public transport
- Measures to encourage sustainable modes of transport

Such assessment can be used as the basis for the creation and implementation of a travel plan post-occupancy.

3.2

Solid Waste Management (SWM)



Issues addressed:

- SWM 01 – Waste Mapping
- SWM 02 – Waste Management
- SWM 03 – Single-Use Plastics

UN Sustainability Strategy 1:

- Percentage of waste diverted to reuse/recycling
- Percentage of entities with formal waste management programs
- Percentage of hazardous waste formally processed using environmentally sound management standards
- Percentage reduction in environmental impacts from facilities as measured by the environmental inventory
- Percentage reduction of single-use plastics in entity headquarters/in-field/humanitarian operations
- Percentage reduction of plastics from UN activities or compounds dispersed in the environment

Benefits:

- Environment, Health and Wellbeing, Cost, Reputation, Legal Compliance

SDG Contribution:

- SDG Goal 6: Ensure access to water and sanitation for all
- SDG Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all
- SDG Goal 11: Make cities inclusive, safe, resilient and sustainable
- SDG Goal 12: Ensure sustainable consumption and production patterns
- SDG Goal 14: Conserve and sustainably use the oceans, seas and marine resources



SWM 01

Waste Mapping

Context:

Proper waste management is essential to a healthy society and economy as a whole. Yet, at the same time, 2 billion people, globally, are without waste collection services while 3 billion lack access to controlled waste disposal facilities¹⁸.

The UN operates in such locations, and it is in these locations that good waste management matters the most and can have the greatest positive or negative impact on human health and the environment.

According to the 2020 UN-wide waste inventory¹⁹, it is estimated that the UN generates 457kg of waste per capita per year. However, only 13% of that waste is recycled, with nearly half of all waste disposed to landfills that do not meet minimum engineering requirements to prevent air, water, and soil pollution. Such landfills are often referred to as waste dump sites, and they pose a significant danger to human and environmental health²⁰.

An office with good waste management practices typically generates below 200kg of waste per capita per year and achieves recycling rates of between 60% and 70%²¹.

Criteria:



Minimum

M1: Estimate quantities and types of waste to be generated by the new office.

M1: Identify hazardous waste streams to be generated by the new office.

M2: Consult with local waste management partners (e.g. municipal waste collection service, waste contractors, private sector, NGOs) regarding possibilities to reuse, recycle, recover and/or safely dispose of all waste streams, particularly hazardous ones.



Desirable

D1: Commission an expert (e.g. waste consultant) to commence preparation of an Integrated Sustainable Waste Management Plan (SWMP) pre-occupancy and in line with the following ten tips from the UN's "Say yes to less" guidance (password needed)²²:

Tip 1. Understand your waste

Tip 2. Monitor your waste

Tip 3. Strategize and set targets

Tip 4. Look separately at special waste types

Tip 5. Adopt a waste management policy

Tip 6. Build waste management into procurement

Tip 7. Reuse internally and externally

Tip 8. Engage your waste management partners

Tip 9. Provide enabling infrastructure to facilitate behavior change

Tip 10. Communicate

D2: Assign responsibility to a staff member for the development and implementation of an SWMP.

Guidance:

Relevant UN personnel should follow the comprehensive UN's waste management guidelines developed as part of the 'Say Yes to Less' campaign. The guidelines are available within the focal point area of Greening the Blue website²² for which a log-in is required. Contact your entity's Sustainability Focal Point or the SUN team at info@greeningtheblue.org for log-in information.

Waste Mapping / Audit Procedures for estimating waste quantities and streams based on existing office premises could follow the following steps:

1. Decide on a strategy. The two major waste streams to be audited are waste that goes to a landfill or incinerator, and waste that is recycled, reused, or composted. Include non-hazardous and hazardous waste streams. Choose a period of time (e.g. one week). Decide on a unit of measurement, either weight or volume, and use it consistently. Inform janitorial staff and waste-hauling vendors and enlist their cooperation, but do not notify building occupants; the results must reflect their typical disposal and recycling behaviours.
2. Collect the waste to be audited. Collect the contents of both waste streams. Keep the waste to be audited separate from previous or subsequent days, and separate the landfill and diverted waste. For more precise results, each bag or container of waste may be labeled with its origin (e.g., second-floor offices, fitness center, parking garage).
3. Sort both waste streams. Necessary equipment may include clothing (e.g., puncture-proof rubber gloves, safety glasses, protective suits), a tarp or plastic sheet for waste sorting, containers or bags, a scale, and a camera for documentation. Wet waste (food and restroom waste) does not need to be sorted because of hygienic concerns, but the associated weight or volume and any diversion must be tracked.
4. Measure landfill or incinerator waste. Measure the total amount and the amount of each recyclable material (mixed paper, corrugated cardboard, glass, plastics, and metals) that was inappropriately thrown away. Also, measure the amount of inappropriately disposed e-waste, mercury-containing lamps, and (optional) compostable material.
5. Measure diverted waste. Measure the total amount and the amount of each recycled material (mixed paper, corrugated cardboard, glass, plastics, and metals). Note the amount and kinds of non-recyclable waste that was placed in recycling bins and any e-waste and mercury-containing lamps. If the project building has a reuse or composting program, measure the total amounts.
6. Prepare the waste audit report. The report must cover the following topics:
 - a. Procedures, including the period of time, scope, and methods for sorting and measuring waste.
 - b. Types of waste and the amounts of each type, by weight or volume.
 - c. Opportunities to decrease waste generation (source reduction) and increase diversion rates.
 - d. Brief analysis of how waste diversion and source reduction could reduce the project's waste-hauling costs (optional).
 - e. Project teams may include paper diverted by a document-shredding vendor if the vendor recycles the paper. If the vendor does not recycle, the shredded paper must be included in the calculations.

18. UN Department of Economic and Social Affairs - Statistics Division; <https://unstats.un.org/sdgs/report/2019/goal-11/>

19. Greening the Blue Report 2020, UNEP; <https://tinyurl.com/4stxtst2>

20. The world's biggest and most dangerous dump sites – interactive; The Guardian, October 2014; <https://tinyurl.com/35ha6ut7>

21. Green Office: A Guide to Running a More Cost-effective and Environmentally Sustainable Office; <https://tinyurl.com/usp86x4d>

22. <https://www.greeningtheblue.org/focal-point-area>

SWM 02

Waste Management

Context:

See SWM 01

Guidance:

The 'Say Yes to Less' UN waste management guidance contains fact sheets related to the following hazardous waste streams: E-waste (batteries), E-waste (electrical and electronic equipment), E-waste (light bulbs and lamps), construction waste, paints and chemicals, motor oil and refrigerants. In addition to hazardous, there are fact sheets related to the following non-hazardous waste streams: glass, metal, paper, textiles/fabric and wood.

Criteria:



Minimum

M1: Ensure that new premises contain adequate infrastructure for the separation and storage of identified hazardous waste streams.

M2: Where hazardous waste stream cannot be adequately processed in a location, consider the following options:

- Eliminate hazardous waste streams by finding alternatives
- Temporarily store on-site in sealed containers and/or covered bunded areas until either:
 - Exported to a third-country for processing subject to compliance with applicable legislation on transboundary movement of hazardous waste (e.g. Basel Convention)
 - Stored in a sealed container that prevents contamination when disposed to a sanitary (lined) landfill



Important

I1: Ensure that the proposed site has an adequate central waste storage area in terms of size, location, staff/contractor safety and signage, relevant to premises size and waste streams (i.e. non-recyclable and recyclable), as well as waste collection arrangements (i.e. frequency and types of waste collected). BREEAM standard proposes the following waste storage area sizes:

- At least 2m² per 1000m² of net floor area for buildings < 5000m²
- A minimum of 10m² for buildings ≥ 5000m²
- An additional 2m² per 1000m² of net floor area where catering is provided (with an additional minimum of 10m² for buildings ≥ 5000m²).
- Ensure adequate area, in terms of size, signage and containment properties, for collection, separation and safe storage of hazardous waste streams such as e-waste, engine oil, medical waste, car batteries or tires.



Desirable

See SWM 01

SWM 03

Single-use Plastics

Context:

2020-2030 UN Sustainability Strategy commits the UN system to the reduction of single-use plastics across UN compounds and activities.

Plastic is made from fossil fuels and consumes energy and water in its production. Plastic takes up to 500 years to break down on land and accounts for more than 80% of marine litter: more than 100,000 tonnes, of mostly so-called micro-plastics, is floating in the world's oceans. The European Commission says that plastic is a serious threat to marine biodiversity and a vehicle for endocrine disruptors to enter the food chain, potentially endangering human health.

Single-use plastics such as straws, bags, food containers and bottles are a particular concern due to the quantities generated due to their temporary use.

Guidance:

Adequate provision of drinking water refers to the number of water fountains per total number of building occupants and their location. For example, BREEAM specifies a minimum of 1 water fountain per 200 occupants with a provision on each floor of a building.

Criteria:



Minimum

M1: Choose premises with adequate provision of safe, preferably mains-fed, chilled drinking water fountains/dispensers/taps to discourage procurement of plastic water bottles. If mains-fed (i.e. tap water) is not considered safe, provide water fountains/dispensers using re-usable refill bottles.

M2: Ensure catering services provided or to be procured eliminate single use plastics including for food containers, cups, glasses, cutlery, carrier bags and similar.

M3: Ensure that any procurement, including during fit-out, renovation and construction works eliminates and/or minimizes non-essential single-use plastics from packaging, stationery, cleaning products and similar.

3.3

Health and Wellbeing (HW)



Issues addressed:

- HW 01 – Outdoor (ambient) Air-Pollution - Generators
- HW 02 – Outdoor (ambient) Air-Pollution - Boilers
- HW 03 – Outdoor (ambient) Air-Pollution – Motor Vehicles
- HW 04 – Outdoor (ambient) Air-Pollution – Refrigerants
- HW 05 – Indoor Air Quality – Ventilation
- HW 06 – Indoor Air Quality – VOCs, Formaldehyde, Carcinogens
- HW 07 – Thermal Comfort
- HW 08 – Visual Comfort

Benefits:

- Health and Wellbeing, Environment, Cost (Productivity and Energy Saving), Resilience

UN Sustainability Strategy 1:

- Percentage reduction in environmental impacts from facilities
- Percentage reduction in energy consumption
- Percentage of renewables
- Percentage fuel in use that meets international quality standards
- Percentage reduction in fuel use from ground transport
- Percentage of electric vehicles
- Percentage of UN entities that have phased out ozone-depleting substances
- Percentage of UN entities with a plan for phase-down of HFCs
- Percentage of UN premises/facilities using low GWP equipment for refrigeration and air conditioning

SDG Contribution:

- SDG Goal 3: Ensure healthy lives and promote well-being for all at all ages
- SDG Goal 11: Make cities inclusive, safe, resilient and sustainable



HW 01

Outdoor (ambient) Air-Pollution - Generators

Context:

Fossil fuel combustion in generators, boilers and motor vehicles produces air pollutants such as particulate matter (PM), sulfur-oxides (SO_x), nitrogen oxides (NO_x) and ozone (O₃) that are detrimental to human health. WHO estimates that 4.2 million people die every year due to exposure to outdoor air pollution and that 91% of the world's population lives in places where air quality exceeds WHO guidelines²³.

Furthermore, facility operation can contribute to production of air-pollutants known as short-lived climate pollutants, which stay in the atmosphere for a much shorter period than CO₂ but can have a significant greenhouse gas effect due to their potency. These include, black carbon and tropospheric ozone from fossil fuel combustion, methane and hydrofluorocarbons (HFCs) used as refrigerants in air conditioning and refrigeration.

2020-2030 UN Sustainability Strategy commits the UN to 'minimize to the extent possible' such emissions.

Criteria:



Minimum

M1: Do not select premises that rely on diesel generators for non-emergency electricity supply

OR

Where diesel generators are unavoidable due to unreliable or non-existent grid electricity, ensure that:

- diesel generators are sized to meet 75 to 80% of peak electrical demand AND
- generator chimneys are away from building occupants and external public areas (e.g. on top of buildings with adequate chimney height) to aid dispersion of emissions



Important

I1: Do not select premises that rely on diesel generators for non-emergency electricity supply

OR

Where diesel generators are unavoidable due to unreliable or non-existent grid electricity commission an expert (e.g. energy engineer) to analyze the following:

- reduction of energy demand through efficiencies and opportunities for on-site renewables (e.g. photovoltaic panels can be particularly cost-effective when compared to the cost of diesel)
- existing and/or new generator(s) compatibility with electrical demand (e.g. avoid oversizing)
- iii. feasibility of replacing existing generators (if any) with new models as they are likely to be less polluting and more energy efficient
- feasibility of specifying new generators with modular capability as well as advanced control and management capability
- location of generators' chimneys and options for locating them away from building occupants and external public areas (e.g. on top of buildings with adequate chimney height) to aid dispersion of emissions



Desirable

D1: Do not use diesel generators for main electrical supply OR where their use is unavoidable due to operational constraints ensure, in addition to important actions, the existence of emissions abatement equipment such as:

- particulate traps to reduce emissions of PM10
- selective catalytic reduction to reduce NO_x emissions



Guidance:

Diesel generators are most efficient when operating at 100% capacity and are recommended to operate between 75-80% to allow for sudden power surges. If a diesel generator is operated at close to its peak capacity, its efficiency can increase from 22% to over 35%. The efficiency can also be improved by ensuring that the exhaust air is prevented from mixing with the clean airflow for the engine.

BREEAM specifies that sources of external pollution, such as generator chimneys, should be at least 10 meters horizontal distance from openable windows and fresh air intakes.

HW 02

Outdoor (ambient) Air-Pollution - Boilers

Context:

See HW 01

Guidance:

For further information on NOx emissions related to boilers, see BREEAM International 2016 New Construction standard²⁴.

24. https://www.breeam.com/BREEAMInt2016SchemeDocument/#12_pollution/pol02.htm%3FTocPath%3D13.0%2520Pollution%7C_____2

Criteria:



Minimum

None



Important

I1: Ensure any existing and/or proposed non-electric boilers providing space heating and/or hot water do not exceed the following NOx emissions:

- a.** Gas boiler: 56 mg/kWh at zero excess O₂;
- b.** Oil boiler: 73 mg/kWh
- c.** Biomass/solid fuel boiler: 130 mg/m³

AND

- d.** PM₁₀ emissions for biomass and solid fuel boilers of 14 and 19 mg/m³, respectively

I2: Consider the feasibility of specifying solar thermal panels for hot water and space heating purposes.



Desirable

D1: Ensure any existing and/or proposed non-electric boilers providing space heating and/or hot water do not exceed the following NOx emissions:

- a.** Gas boiler: 27mg/kWh at zero excess O₂;
- b.** Oil boiler: 50 mg/kWh
- c.** Biomass/solid fuel boiler: 70 mg/m³

AND

- d.** PM₁₀ emissions for biomass and solid fuel boilers of 11 and 17 mg/m³, respectively

HW 03

Outdoor (ambient) Air-Pollution - Motor Vehicles

Context:

See HW 01

Criteria:



Minimum

M1: Follow EGE 04 Ground Travel minimum requirement above, subject to meeting UNDSS requirements.



Important

I1: Follow EGE 04 Ground Travel important requirements above, subject to meeting UNDSS security requirements.

I2: Ensure premises under consideration have or are able to have the infrastructure to support use of zero and low emission modes of transport and vehicles (e.g. cyclists facilities, e-vehicle charging points)



Desirable

D1: In addition to important actions:

- Maximize the use of electric vehicles through procurement of official fleet and staff incentives for private vehicles

AND

- Where diesel and petrol motor vehicle use is unavoidable, specify vehicles with engines that meet emission standards such as EU's Euro 6 or equivalent

HW 04

Outdoor (ambient) Air-Pollution - Refrigerants

Context:

See HW 01

Criteria:



Minimum

M1: Wherever possible, select offices that do not require air-conditioning, i.e. do not use refrigerants to maintain acceptable temperature levels and thermal comfort.

M2: Where M1 is not possible, ensure that any newly specified Heating Ventilation and Air-Conditioning (HVAC) equipment does not use refrigerants with Ozone Depletion Potential (ODP) nor HFC refrigerants (Hydrofluorocarbons) with extremely high Global Warming Potential (GWP) that are subject to phase-out under Kigali Amendment to the Montreal Protocol.



Important

I1: If there are existing refrigerants with high GWP and/or ODP present in significant quantities (i.e. more than 40kg charge), then consider the cost of phase-out / replacement with lower GWP HFCs (e.g. R32 with GWP of 675) or HFOs (Hydrofluoroolefins such as R1234yf with GWP of 4) or natural refrigerants (e.g. R-290 with GWP of 3 or R-717 with GWP of 0).



Desirable

D1: Specify refrigerants with zero ODP and GWP of less than 10 (i.e. HFOs or natural refrigerants)

OR

Specify refrigeration systems that are hermetically sealed or provide automated leak detection, isolation and containment.



Guidance:

Evaluating the cooling demand of an office space and consequently, the need for air-conditioning can involve complex thermal modelling, which UN personnel involved in the selection of new premises may not have access to or time and resources to the commission. Thus, the relevant personnel should consider whether typical office buildings in the location rely on air-conditioning or are naturally ventilated and cooled. In places where a substantial proportion of office buildings does not require air-conditioning, naturally ventilated and cooled buildings should be prioritized.

The main refrigerant types include:

- CFCs (chlorofluorocarbons) made up of chlorine, fluorine and carbon, are associated with the greatest ODP.
- HCFCs (hydrochlorofluorocarbons) made up of hydrogen, chlorine, fluorine and carbon, are not as detrimental as CFCs but do have ODP.
- HFCs, made up of hydrogen, fluorine and carbon, are the least damaging to the earth's ozone layer and have as such been used to replace refrigerants with ODP. However, due to their GWP, HFCs with high GWP are subject to phase out under the 2019 Kigali Amendment to the Montreal protocol.
- HFOs are the fourth-generation refrigerants associated with zero ODP and low GWP.
- Natural refrigerants are chemicals that occur in nature, such as ammonia, carbon dioxide or propane. They have zero ODP and zero or negligible GWP.

HW 05

Indoor Air Quality – Ventilation

Context:

Indoor air quality (IAQ) is determined by two key factors:

- Indoor concentrations of carbon dioxide (CO₂) and contaminants such as volatile organic compounds (VOCs), formaldehyde, carcinogens, carbon monoxide (CO), ozone, particulate matter and others.
- Effectiveness of the ventilation system to bring and distribute adequate volumes of fresh outdoor air and/or treated re-circulated air to building occupants.

Poor indoor air quality (e.g. concentrations of CO₂ of over 1,000 ppm or PM_{2.5} Air Quality Index of over 100) can lead to lethargy and underperformance and has been linked to Sick Building Syndrome, for example.

While improved ventilation, which is often necessary to improve indoor air quality, may result in additional energy costs, studies have shown that a 1% improvement in productivity, as a result of good indoor air quality, would exceed monetary value saved in a building that is 50% more energy efficient.

Criteria:



Minimum

M1: Where possible, select offices with openable windows

M2: In the case of mechanically ventilated offices, confirm specified system's ventilation rates are in line with good practice.



Important

I1: Ensure/seek confirmation from an expert (e.g. building services engineer) that the proposed building's fresh air ventilation rates align with the relevant national or international best practice standards.

I2: If possible, ensure that HVAC air intakes and openable windows are at least 10m away from sources of pollution such as roads, car parks and indoor air outlets.

I3: Provide adequate filtration to HVAC systems.

Mechanical air filters that can filter PM 2.5 reasonably well are rated as MERV 13 or higher in the U.S and Class F7 or higher in Europe.



Desirable

D1: Appoint a suitably qualified professional or negotiate their appointment within lease agreements, project briefs and similar to prepare and implement a pre-occupancy indoor air quality plan.

The plan should address the following:

- Removal of contaminant sources
- Dilution and control of contaminant sources
- Procedures for pre-occupancy flush out
- Third-party testing and analysis
- Maintaining indoor air quality post-occupancy

D2: Specify/install CO₂ and/or air quality sensors in areas of the building subject to large and unpredictable occupancy patterns and link them to the ventilation system



Guidance:

Mechanically ventilated offices

Typical good practice for fresh air ventilation rates is 10 litres/person/second²⁵. ASHRAE Standard 62.1 for a typical office occupancy of 1 person per 20m², results in a slightly lower requirement of 8.5 l/p/s. However, based on standard UN occupancy of 1 person per 15m², the fresh air ventilation rates should be closer to 10 litres/person/second as per ISO 17772.

Naturally ventilated offices

Follow the guidance within CIBSE AM10 manual section 2.4. For rooms with windows on one side and a single opening, room depths should not be more than 2 times floor to ceiling height. For rooms with windows on both sides (allowing cross ventilation), room depths should not be more than 5 times floor to ceiling height. For further information and to assess other factors such as wind speed or stack effect, refer to CIBSE AM10: Natural Ventilation in Non-domestic Buildings 2005²⁶.

25. ISO 17772 – 1: 2017 Energy performance of buildings – Indoor environmental quality

26. CIBSE AM 10: <https://tinyurl.com/yk92w372>

HW 06

Indoor Air Quality – VOCs, Formaldehyde, Carcinogens

Context:

See HW 05

Criteria:



Minimum

M1: Purchase or request purchase of domestic grade CO₂, Air Quality Index (AQI) and VOC measurement equipment.

M2: Commit to or ensure commitment from landlord to increase ventilation rates, remove contaminant sources and/or improve mechanical ventilation filtration where measured levels of CO₂, AQI and VOC under full occupancy are exceeded.



Important

I1: Ensure that the following products, where newly specified, contain low levels of formaldehyde (i.e. ≤ 0.06 mg/m³), VOCs (≤ 1.0 mg/m³) and Category 1A and 1B carcinogens (≤ 0.001 mg/m³):

- Interior paints and coatings
- Wood-based products (including wood flooring)
- Flooring materials (including floor levelling compounds and resin flooring)
- Ceiling, wall, and acoustic and thermal insulation materials
- Interior adhesives and sealants (including flooring adhesives)

The above products are likely to have been tested against one or more of the following standards: EN 16402, ISO 16000-9, CEN/TS 16516, CDPH Standard Method, EN 717-1, ISO 10580, EN 13999 (Parts 1-4)



Desirable

D1: Commission an expert or organization to carry out testing of:

- Formaldehyde concentration in indoor air post-construction/post-renovation (but pre-occupancy) and ensure it does not exceed 100µg/m³, averaged over 30 minutes. The formaldehyde sampling and analysis should be performed in accordance with ISO 16000-2 and ISO 16000-3.
- Total volatile organic compound (TVOC) concentration in indoor air post-construction/post-renovation (but pre-occupancy) and does not exceed 300µg/m³, averaged over 8 hours. The TVOC sampling and analysis should be performed in accordance with ISO 16000-5 and ISO 16000-6 or ISO 16017-1.

D2: Where levels are found to exceed the above limits, ensure that appropriate measures are undertaken in accordance with the IAQ plan, to reduce the TVOC and formaldehyde levels to within the limits.

Guidance:

Domestic grade, affordable equipment (see picture) for measuring indoor air quality is widely available and can offer valuable first insight into potential problems. For example, UN Peer Review teams are using such equipment as a standard part of indoor air quality evaluation.

AQI of outdoor air displays the worst air quality from a range of measured pollutants. Typical pollutants measured are PM_{2.5}, PM₁₀, Ozone, Carbon Monoxide, Sulfuric Dioxide and Nitrogen Dioxide. The AQI allows different types of pollutants with different units of measurements to be calculated into values ranging from 0 to 500. Table 2 below demonstrates AQI categorization. Table 3 below demonstrates acceptable VOC values in different locations.



Table 2: AQI Indicators

AQI values	Descriptions
0-50	Good
51-100	Moderate
101-150	Unhealthy for Sensitive Groups
151-200	Unhealthy
201-300	Very Unhealthy
301-400	Hazardous
401-500	Very Hazardous

Table 3: Acceptable VOC values

VOC values	Remarks
<0.2 mg/m ³	No irritation or discomfort.
<0.3 mg/m ³	European Community targeted guideline.
1-5 mg/m ³	Values being discussed for US standards.
2 mg/m ³	Minimum value measured for a 'sick building' syndrome ²⁷ .
1 mg/m ³	Taiwan Suggested Legal Limit in 2014

27. Kacergis J.B. et al. 1996. Air quality in an animal facility: particulates, ammonia, and volatile organic compounds. American Industrial Hygiene Association Journal 57(7):634-640

HW 07

Thermal Comfort

Context:

Thermal comfort conditions have a direct impact on occupants' satisfaction and performance. Although often associated with air temperature only, thermal comfort is also affected by other factors such as radiant (surface) temperature, airspeed, humidity, clothing, activity type, seasonal adaptation, degree of control and type of space.

While it may not always be practical to commission an in-depth thermal comfort analysis that considers all of these factors, the UN should, as a minimum, consider the qualitative assessment of these factors.

Criteria:



Minimum

M1: Select premises that offer sufficient occupant control of individual thermal comfort levels. This can be achieved via zoned thermal controls such as room thermostats and Thermostatic Radiator Valves (TRVs), shading devices (e.g. occupant-controlled blinds), fans, openable windows and similar.



Important

I1: Carry out a qualitative assessment of the building's likely thermal comfort performance taking into consideration:

- heating, cooling and ventilation strategy
- heating, cooling and ventilation controls
- local climate (e.g. humidity, hottest and coldest periods)
- building orientation, shading and glazing
- previous occupancy surveys (if any) highlighting problem areas

I2: Choose/specify premises based on qualitative thermal comfort assessment.



Desirable

D1: Commission an expert (e.g. building physicist, building services engineer) to carry out a thermal comfort analysis in line with best-practice standards such as:

- ISO 7730 Ergonomics of the thermal environment - Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria
- Annex A of EN 15251:2007 Energy performance of buildings – Criteria for the indoor environment OR
- ASHRAE Standard 55-2010 – Thermal Environment Conditions for Human Occupancy

D2: Choose/specify premises based on thermal comfort analysis and ensure contractual commitment to conduct periodic thermal comfort surveys.

HW 08

Visual Comfort

Context:

Access to natural light (daylight) reinforces circadian rhythms and as such, has a positive effect on the health and productivity of building occupants.

Adequately designed artificial lighting to allow sufficient lighting levels for a specific individual or group tasks, minimize glare and ensure easy occupant control are demonstrated to result in improved occupant productivity and comfort²⁸.

Guidance:

Illuminance (LUX level) can be measured using a light meter at a desk height (see picture). Light meters are widely available and affordable at costs starting at USD20.



28. Lighting Quality and Office Work: A Field Simulation Study; US Department of Energy 2013; <https://tinyurl.com/56rr79ky>

Criteria:



Minimum

M1: Choose/specify offices where all working spaces (e.g. offices) have windows or other access to natural light (e.g. light wells).

M2: Measure indoor natural and artificial lighting levels using a light meter.

M3: Choose/specify buildings where the majority of working spaces (i.e. over 50%) have good levels of daylight. BREEAM defines good levels in terms of an average daylight factor of 2%, while LEED defines it as illuminance levels of between 300 and 3000 LUX for at least 50% of the regularly occupied floor area.

M4: Ensure existing or specify new artificial lighting illuminance levels of 300 LUX are provided for screen-based tasks in offices and 500 LUX for paper-based tasks. These can be reduced where individual task lighting is provided.



Important

I1: Ensure the presence of/ specify local controls and separate lighting zones (e.g. for areas near windows).



Desirable

D1: Choose/specify buildings where over 80% of occupied spaces have good levels of daylight.

D2: Specify internal lighting in line with best-practice standards such as the ILE Lighting Handbook, 10th edition or EN 12464-1 Light and lighting – Lighting of workspaces 2011.

3.4

Water and Wastewater Management (WWM)



Issues addressed:

- WWM 01 – Water Intensity Analysis and Benchmarking
- WWM 02 – Water Efficiency Measures
- WWM 03 – Water Monitoring
- WWM 04 – Wastewater Management

Benefits:

- Environment, Health and Wellbeing, Reputation, Cost, Legal Compliance

UN Sustainability Strategy 1:

- Percentage of sites with water efficiency measures
- Percentage of reclaimed water reported
- Percentage of wastewater disposed untreated

SDG Contribution:

- SDG Goal 3: Ensure healthy lives and promote well-being for all at all ages
- SDG Goal 6: Ensure access to water and sanitation for all
- SDG Goal 14: Conserve and sustainably use the oceans, seas and marine resources



WWM 01

Water Intensity Analysis and Benchmarking

Context:

Water is a precious resource, essential to daily survival, hygiene and sanitation. Yet, more than 2 billion people globally are living in countries with excess water stress, which is defined as the ratio of total freshwater withdrawn to total renewable freshwater resources above a threshold of 25 per cent²⁹. This situation is worsening through the effects of climate change and population growth. By 2050, approximately 5 billion people will have felt the effects related to freshwater scarcity³⁰. In addition to water scarcity, a significant proportion of the global population, particularly those living in rural areas, lack access to clean water and water supply infrastructure.

29. <https://sustainabledevelopment.un.org/sdg6>

30. The United Nations world water development report 2018: nature-based solutions for water, UNESCO 2018 <https://tinyurl.com/43pbzxc>

31. Water Stress by Country Map, Water Resources Institute, 2013; <https://tinyurl.com/6up6um4>

32. Water Key Performance Indicators and benchmarks for offices and hotels, CIRIA 2003; <https://tinyurl.com/3n5yxnp>

Criteria:



Minimum

M1: Establish new premises' actual (e.g. based on meter readings) Water Use Intensity (WUI) in litres or m³ per person per year (or per day using 253 days per year) or where no billing / metering data available, commission an expert (e.g. sustainability consultant, building services engineer) to estimate likely WUI based on sanitary fittings specification.

M2: Establish your existing premises' actual or estimated WUI, compare to new premises actual or estimated WUI and ensure no net increase associated with new premises.



Important

I1: Determine water stress category for your location using the World Resources Institute Water Stress Map³¹

I2: Ensure a new office meets the following WUI:

- a. For extremely high, high and medium to high-stress areas either: 2.0m³/person/per year or 7.9 litres/person/day
- ii. For low and low to medium areas, either: 4.0m³/person/per year or 15.8 litres/person/day³²



Desirable

D1: Target 2.0m³/person/per year or 7.9 litres/person/day in all water stress areas

WWM 02

Water Efficiency Measures

Context:

See WWM 01

Criteria:



Minimum

M1: If performance targets under WWM 01 are not met, specify / request one or more of the following:

- Rainwater harvesting and/or greywater recycling.
- Dual flush WCs with an average flush volume of ≤ 4.5 litres; A 3 litre average flush volume is also available.
- Urinals with timed or PIR (passive infrared movement sensor) controlled flush with ≤ 3 litres per flush; Waterless urinals can be considered.
- Hand washing basin taps with less than 6 litres per minute flow rate and automatic control (e.g. pushbutton or active infrared control for shut-off).
- Showers with a flow rate of less than 6 litres per minute.
- Water-efficient appliances, including domestic and commercial sized washing machines and dishwashers.
- Drip irrigation and timer & humidity controlled sprinkler systems, especially in water-stressed zones, to irrigate gardens and landscape.
- Explore xeriscaping options and opt for low-water native/indigenous plant species. Minimize grassed lawn areas.
- Pressure washers for car wash to substitute the use of buckets and hoses. This also results in reduced soap usage.
- HVAC condensate collection and reuse for irrigation.

WWM 03

Water Monitoring

Context:

See WWM 01

Criteria:



Minimum

- M1:** Ensure new offices have a water meter to the main water supply (mains or tank) to the site or building.
- M2:** In cases where water tanks are used, ensure the presence of a shut-off float valve to avoid water tank overflow.



Important

- I1:** In large shared/common premises, especially where local water resources are scarce or supply is expensive (i.e. trucked in or obtained from a desalination plant), install water sub-meters serving each entity to encourage water-saving behaviours.



Desirable

- D1:** Ensure written commitment and capacity for testing of both potable water and water for irrigation for pollutants and particulates.
- D2:** Select / specify premises with leak detection systems with alarms and sanitary shut-off valves for WC/toilet areas.

WWM 04

Wastewater Management

Context:

Discharge of untreated or inadequately treated wastewater into natural watercourses can have an extremely negative impact on ecosystems and human health. Such problems are common in many locations where the UN operates, and careful consideration of options to minimize risks posed by UN's own wastewater disposal is essential.

Guidance:

U.S. Environmental Protection Agency (EPA) Guidance on Onsite Wastewater Treatment and Disposal Systems:

<https://www.epa.gov/septic/onsite-wastewater-treatment-and-disposal-systems>

Criteria:



Minimum

M1: Select / specify premises that do not directly discharge untreated sewage into water bodies such as rivers or streams.

M2: Ensure that surface water pollutants such as motor oil, vehicle wash run-off and similar are adequately contained and/or treated prior to discharge to a municipal drain or ground.



Important

I1: Conduct wastewater management risk assessment taking into consideration existing infrastructure (e.g. municipal and on-site treatment), terrain type, receiving waters, quantity and quality of wastewater.

I2: If municipal infrastructure is inadequate or non-existent, appoint an expert to conduct the feasibility of options for on-site wastewater treatment; On-site treatment should provide the following treatment levels:

- Primary – settlement of solids;
- Secondary – removal of organic matter; and
- Tertiary – removal of inorganics and/or disinfection.



Desirable

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3.5

Biodiversity (BIO)



Issues addressed:

- BIO 01 – Site Selection
- BIO 02 – Ecological Protection
- BIO 03 – Ecological Enhancement
- BIO 04 – Legal and Sustainable Timber

Benefits:

- Environment, Legal Compliance

UN Sustainability Strategy 1:

- Percentage of sites for new premises that have been screened for biodiversity impacts
- Percentage of tenders with sustainability criteria at entity and UN wide level

SDG Contribution:

- SDG Goal 6: Ensure access to water and sanitation for all
- SDG Goal 11: Make cities inclusive, safe, resilient and sustainable
- SDG Goal 14: Conserve and sustainably use the oceans, seas and marine resources
- SDG Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.



BIO 01

Site Selection

Context:

According to the Global Assessment Report on Biodiversity and Ecosystem Services³³, an average of 25% or around 1 million animal and plant species to face extinction due to human activities.

Thus, careful consideration of the impact of potential UN premises on local biodiversity is critical.

Guidance:

ISO 18400-104:2018, Soil quality – Sampling – Part 104: Strategies; Part 202: Preliminary Investigations and Part 203: Investigation of potentially contaminated sites <https://www.iso.org/standard/65223.html>

33. The global assessment report on biodiversity and ecosystem services, IPBES, 2018: <https://tinyurl.com/8utupcv>

34. Protected Planet online database of world's protected areas: <https://www.protectedplanet.net>

Criteria:



Minimum

M1a: In the case of new construction, prioritize, wherever possible, previously developed land (brownfield sites) with low ecological value (see BREEAM checklist below) and away from protected areas³⁴ and sensitive habitats.

OR

M1b: In case of existing premises, prioritize sites with zero or low ecological value and those away from protected areas and sensitive habitats.

M2: Ensure potential sites are screened for the presence of non-native invasive species. Where identified, ensure their removal and safe disposal in line with relevant best practice guidance.



Desirable

D1: In the case of new construction, best practice would involve the selection of sites with contaminated soil and/or presence of non-native invasive species and their remediation prior to development.

BREEM Checklist for defining land of low ecological value

	Question	Yes	No
Q1	<p>Have any of the following local organizations identified possible ecological value on the site? All relevant bodies must be contacted before responding to the question.</p> <ol style="list-style-type: none"> 1. The appropriate statutory body 2. Nature or conservation groups. 		
Q2	<p>Is the development within 2km of a clearly defined geographical space recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services (e.g. Ramsar site)? The following sources of information are not exhaustive but can be used to check local land use:</p> <ol style="list-style-type: none"> 1. http://www.protectedplanet.net 2. Appropriate statutory body websites 3. Maps that show specific sites and provide information on local policies relating to that site. 		
Q3	<p>Is the development within 500m of a designated area? The following sources of information are not exhaustive but can be used to check land use:</p> <ol style="list-style-type: none"> 1. http://www.protectedplanet.net 2. Appropriate statutory body websites 3. Maps that show specific sites and provide information on local policies relating to that site. 		

BREEAM Checklist for defining land of low ecological value (continued)

	Question	Yes	No
Q4	<p>Are any of the following habitats present on or within 100m of the construction zone? The following list is not exhaustive but provides guidance on the type of habitat BREEAM defines as having ecological value:</p> <ol style="list-style-type: none"> 1. Woodland (e.g. high forest, coppice, scrub)* 2. Water courses (e.g. rivers, streams or canals)** 3. Wetlands (e.g. swamps, marshes, wet grasslands, peatlands, oases, estuaries, deltas, tidal flats, near-shore marine areas, mangroves, coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans) 4. Grassland (e.g. steppe, prairie, pampas, meadow, veld, campos, savannah, heathland, bogs, etc.) 5. Dwarf shrub habitat (e.g. heathland, moorland, maquis) 6. Arid, semi-arid desert*** 7. Any other habitats considered to have ecological value. 		
Q5	<p>Are any of the following features present within or on the boundary of the construction zone?</p> <ol style="list-style-type: none"> 1. Mature or semi-mature trees 2. Mature hedgerow or mature planting marking a boundary (field hedgerows over 1m tall and 0.5m wide)**** 3. Existing buildings (occupied or derelict) that may provide shelter for wildlife. 		

Notes:

* Woodland is defined as 'having over 25% canopy cover of trees and shrubs, over a metre high'.

** Broad habitats of rivers and streams are defined as running watercourses ranging from small headwater streams to large rivers. This broad habitat, along with wetlands, includes the open water itself and the vegetation along the water's edge.

*** UNEP confirms deserts are unique, highly-adapted natural ecosystems, providing both life-supporting services on the planet and supporting human populations in much the same way as in other ecosystems.

**** A hedge is defined as 'a line of woody vegetation that has been subject to management so that trees no longer take their natural shape'.

BIO 02

Ecological Protection

Context:

See BIO 01

Criteria:



Minimum

M1: Using the BREEAM checklist above, evaluate the ecological value of the proposed sites. If you are unable to answer all the questions seek assistance from a qualified ecologist.

M2: If any features of ecological value are identified, ensure their protection during construction, renovation and occupancy in line with recommendations from an ecologist, recognized 'local' ecological expertise or from relevant published guidance.



Desirable

D1: Commission services of a qualified Ecologist to carry out a site survey and propose best practice measures for the protection of ecological features as well as ecological enhancement.



Guidance:

Features of ecological value found on site should be protected during construction and renovation, as follows:

- Trees of over 100mm trunk diameter, stands of trees, and trees of significant ecological value, should be protected by barriers. Barriers must prohibit construction works in the area between itself and the tree trunk. The minimum distance between the tree trunk and barriers must be either the distance of branch spread or half tree height, whichever is greater. Trees should be protected from direct impact and from severance or asphyxiation of the roots.
- Coastal developments, watercourses, wetland areas, areas of freshwater and known groundwater wells should be protected by cut-off ditches and site drainage to prevent run-off to minimize risk of pollution, silting or erosion.
- Fenced exclusion zones should be maintained around all mangrove stands (landward side) that are being retained to minimise the risk of workforce machinery damage of these sensitive habitats. Activity on the seaward side of mangroves should be avoided where possible and closely monitored and controlled. Confirmation is required that mangrove stands would not be exposed to prolonged drought or waterlogging from changes in water levels as a result of construction activities.
- Other ecological features and natural areas requiring protection should either have barriers erected and be protected or, when remote from site works or storage areas, be protected with a prohibition of construction activity in the vicinity.

BIO 03

Ecological Enhancement

Context:

See BIO 01

Guidance:

BREEAM identifies the following ecological enhancement measures³⁵:

- The planting of locally appropriate native species or non-native species with a known attraction or benefit to local wildlife
- The adoption of good horticultural practice (e.g. no, or low use of residual pesticides)
- The installation of bird, bat or insect boxes at appropriate locations on the site
- Development of a complete biodiversity plan, including avoiding clearance or works at key times of the year (e.g. breeding seasons)
- The proper integration, design and maintenance of nature-based solutions such as sustainable drainage systems (SuDS) (e.g. rain gardens), green roofs, green walls, community orchards, community allotments etc.

35. https://www.breeam.com/internationalRFO2015/content/11_landuse/le04.htm

Criteria:



Minimum



Important



Desirable

I1: Enhance site ecology using recognized 'local' ecological expertise or relevant published guidance.

D1: Commission services of a qualified Ecologist to carry out a site survey and propose best practice measures for the protection of ecological features as well as ecological enhancement.

BIO 04

Legal and Sustainable Timber

Context:

See BIO 01

Criteria:



Minimum

M1: Ensure that any new timber or timber-based products to be used in a potential fit-out, renovation or construction of premises originates from a legally harvested and traded timber source (see definition in Guidance section below).



Important

I1: Ensure that any new timber or timber-based products to be used in potential fit-out, renovation or construction of premises originates from sustainably managed forests with adequate certification (e.g. FSC, PEFC, SFI).



Desirable

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Guidance:

Legally harvested timber and wood-derived products are those that originate from a forest where the following criteria are met:

- The forest owner or manager holds legal use rights to the forest
- There is compliance by both the forest management organization and any contractors with local and national legal criteria, including those relevant to:
 - Forest management
 - Environment
 - Labor and welfare
 - Health and safety
 - Other parties' tenure and use rights
 - All relevant royalties and taxes are paid.
- There is full compliance with the criteria of CITES.

Legally traded means that timber or products derived from legally harvested timber were:

- Exported in compliance with exporting country's laws governing the export of timber and timber products, including payment of any export taxes, duties or levies
- Imported in compliance with importing country's laws governing the import of timber and timber products, including payment of any import taxes, duties or levies
- Traded in compliance with legislation related to the convention on international trade in endangered species (CITES), where applicable.

3.6

Sustainable Procurement (SP)



Issues addressed:

- SPO 01 – Procurement of Services and Materials
- SPO 02 – Green Lease Agreements

Benefits:

- Environment, Health and Wellbeing, Legal Compliance, Reputation, Local Business Support

UN Sustainability Strategy 1:

- Percentage of UN entities with a sustainable procurement policy
- Percentage of tenders with sustainability criteria at entity and UN wide level

SDG Contribution:

- SDG Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all
- SDG Goal 12: Ensure sustainable consumption and production patterns
- SDG Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss



SP 01

Procurement of Services and Materials

Context:

Procurement is a key management function that, alongside human resources, facilities management, events, and ICT, supports the 2020-2030 Sustainability Strategy goals. The strategy commits UN organizations to systematically integrate sustainability considerations (environmental and social) in procurement.

Guidance:

Contact relevant procurement division and/or organizational sustainability focal point to obtain the latest sustainable procurement policies and guidance.

Further resources:

UN Global Market Place (login required):
<https://tinyurl.com/nwwuc9nd>

EU Green Public Procurement Good Practice:
<https://tinyurl.com/46dcjny3>

The Procura+ Manual
<https://procuraplus.org/manual/>

UN HLCM Guidance on Disability Inclusion:
<https://tinyurl.com/novzrm0d>

Criteria:



Minimum

M1: Select new premises and associated professional services and materials (where relevant) in line with your organization's sustainable procurement considerations within existing corporate procurement policies and guidance.

M2: Where sustainable procurement is not addressed within existing policies, please revert to the inter-agency Sustainable Procurement Indicators and incorporate at least one environmental, one social and one economic criterion. Doing so qualifies your tender as "sustainable" on UN Global Marketplace (UNGM). More information can be found on this page: <https://tinyurl.com/hezac0cf>



Important

I1: Require that vendors providing building services can demonstrate proven expertise in sustainable building management in their area of service provision, (e.g. energy, water, waste, IAQ). Ensure female representation, disability inclusion and MSME (Micro, Small and Medium Enterprises) representation.

I2: In case of renovation and new construction, either include the following requirements in contract documents or, if not directly responsible for procurement of contractors, negotiate/promote their inclusion:

- Provide adequate temporary housing and sanitation measures/arrangements for construction workers.
- Provide gender-friendly, safety and protection gears for the workforce.
- Provide lighting at the construction site and the adjacent/nearby place of temporary housing for workers.



Desirable

D1: Prepare a project-specific sustainable procurement plan in line with 2020-2030 Sustainability Strategy and best practice standards (e.g. ISO 20400:2017) prior to project commencement.

- Provide environmentally sound and safe cooking facility for construction workers.
- Provide creche facility for infants/toddlers of construction workers.
- Prohibit child labor
- Ensure 25-50% of a locally contracted workforce with the provision of skills development
- Ensure female representation in the workforce at all levels
- Consider use of MSMEs
- Review supplier's disability inclusion strategy and/or policy (see reference below)

For Materials:

- Locally sourced material (within 50km radius of site)
- Regionally sourced material (in the radius of 150-200km of site)

SP 02

Green Lease Agreements

Context:

Procurement is the key management function that, alongside human resources, facilities management, events, and ITC supports the goals of the 2020-2030 Sustainability Strategy. The strategy commits UN organizations to systematically integrate sustainability considerations (environmental and social) in procurement.

Guidance:

For further guidance including model form green lease clauses, see:

Green Lease Toolkit by the Better Buildings Partnership:
<https://tinyurl.com/npz7csvs>

Green Lease Guide by the Building Owners and Managers Association (BOMA) International:
<https://tinyurl.com/2vnk3vnx>

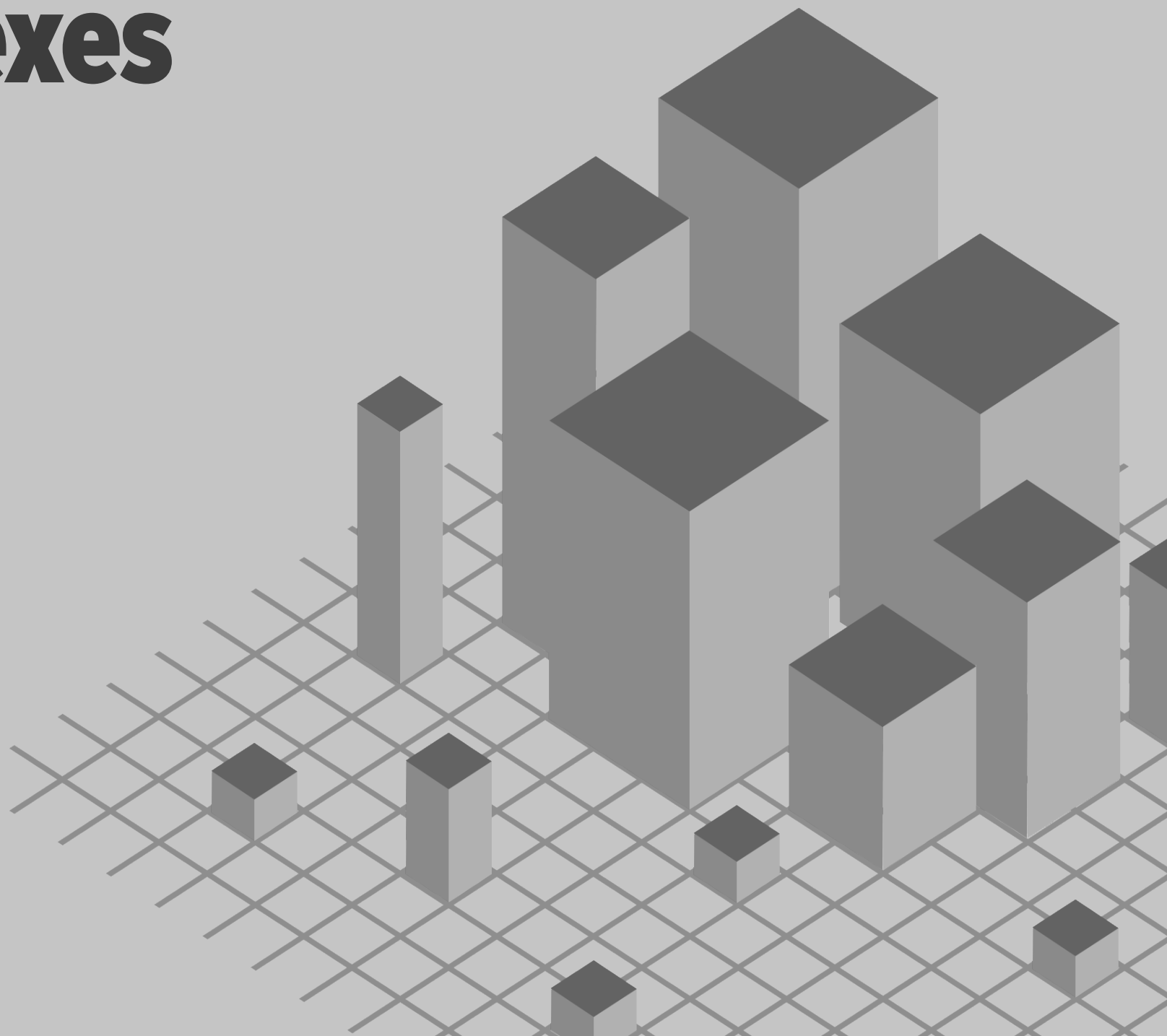
Criteria:



Minimum

M1: Ensure that lease agreements between landlord, management agency, tenants and/or service providers include green lease clauses, whereby all parties are encouraged to collaborate in order to improve the environmental performance of building or site. Green leases would typically cover qualitative and quantitative targets in relation to energy, water and waste, financial incentives, monitoring and reporting procedures, dispute resolution, maintenance and renovation arrangements.

4. Annexes



Annex 1: Level 1 Performance Checklist

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
ENERGY AND GREENHOUSE GAS EMISSIONS			
EGE01 M1a	This office uses or will use less energy (measured in kWh/m ² /year) than our existing office or a typical office in the same location (whichever is lower).	Yes No Don't Know N/A	
EGE01 M1a	This office produces or will produce less GHG emissions (measured in kgCO ₂ eq/m ² /year) than our existing office or a typical office in the same location (whichever is lower).	Yes No Don't Know N/A	
EGE01 M2	This office complies or will comply with our entity-wide Climate Action Plan (CAP).	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
EGE02 M1	This office benefits or will benefit from at least four of the following passive design strategies: <ul style="list-style-type: none"> • Optimal building orientation • Roof insulation • Double-glazing with low-E coating • Wall insulation • Natural ventilation (i.e. openable windows) • Optimal shading • Access to daylight • Thermal mass • Airtight building envelope • Other (describe in comments) 	Yes No Don't Know N/A	
EGE02 M2	This office includes or will include at least two of the following building services and control features: <ul style="list-style-type: none"> • LED internal and external lighting. • Lighting connected to daylight and presence sensors and/or separate lighting zones • Appropriately sized and energy-efficient inverter type split and/or multi-split air conditioning (AC) units or no ACs • Efficient boiler for space heating and hot water (minimum 90% efficiency) • Adequate thermal zoning and controls • Renewable energy technologies • Energy-efficient data centres/server rooms • Other (describe in comments) 	Yes No Don't Know N/A	
EGE02 M3	This office is or can be connected to a grid electricity supplier providing renewable and/or low carbon electricity.	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
EGE02 M4	If relevant, there is or there will be a written commitment from the building owner, developer or manager to implement energy and carbon efficiency measures prior to occupancy.	Yes No Don't Know N/A	
EGE03 M1	Energy meters are or will be installed on all electrical and non-electrical supplies.	Yes No Don't Know N/A	
SOLID WASTE MANAGEMENT			
SWM01 M1	Waste quantities and streams associated with the new office have been measured or estimated.	Yes No Don't Know N/A	
SWM01 M2	Hazardous waste streams have been identified.	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
SWM01 M3	Consultations with local waste management partners (e.g. contractors, businesses, informal sector and/or municipal service providers) regarding reuse, recycling, recovery, and safe waste disposal have been carried out.	Yes No Don't Know N/A	
SWM02 M1	Waste storage area is or will be of adequate size and is or will be conveniently located, labelled and signposted.	Yes No Don't Know N/A	
SWM02 M2	Options for sound management of hazardous waste streams that cannot be safely collected and processed in the country of operation have been considered.	Yes No Don't Know N/A	
SWM03 M1	There is or there will be adequate provision of safe, preferably mains-fed, chilled drinking water fountains/dispensers/taps to discourage procurement of plastic water bottles.	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
SWM03 M2	If relevant, catering services provided or to be procured eliminate single-use plastics, including for food containers, cups, glasses, cutlery, carrier bags and similar.	Yes No Don't Know N/A	
SWM03 M3	If relevant, procurement related to fit-out, renovation and construction works will eliminate and/or minimize non-essential single-use plastics from packaging, stationery, cleaning products and similar.	Yes No Don't Know N/A	
HEALTH AND WELLBEING			
HW01 M1	Diesel generators are not or will not be used for non-emergency electricity supply	Yes No Don't Know N/A	
HW01 M1	Where used for non-emergency electricity supply, diesel generators are or will be sized to meet 75 to 80% of the peak electrical demand, AND generator chimneys are or will be located away from building occupants and external public areas	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
HW04 M1	This office is in a location with low cooling demand AND no air-conditioning is or will be specified.	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
HW04 M2	Any newly specified HVAC equipment does not or will not use refrigerants with Ozone Depletion Potential (ODP) nor HFC refrigerants with extremely high Global Warming Potential (GWP) that are subject to phase-out under Kigali Amendment to the Montreal Protocol.	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
HW05 M1	This office has or will have openable windows	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
HW05 M2	The mechanical ventilation rates are or will be in line with good practice (i.e. 10 litres / person/ second).	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
HW06 M1	There is a written contractual commitment to purchase/provide domestic scale equipment for measuring CO ₂ , Air Quality Index (AQI) and VOC levels during the initial stages of occupation.	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
HW06 M1	There is a written contractual commitment to implement remedial measures such as increased ventilation, improved filtration and/or removal of contaminants should levels of CO ₂ , AQI and/or VOC be above recommended levels during the initial stages of occupation.	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
HW07 M1	Occupants can or will be able to control their own thermal comfort levels through either openable windows, room thermostats, shading devices, fans or similar.	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
HW08 M1	All working spaces (e.g. offices meeting rooms) have or will have windows or other access to natural light (e.g. light wells)	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
HW08 M2	Indoor natural and artificial lighting levels have been or will be measured using a light meter.	Yes No Don't Know N/A	
HW08 M3	At least 50% of working areas have/will have good daylighting levels (i.e. do not require artificial lighting during daylight)	Yes No Don't Know N/A	
HW08 M4	Artificial lighting illuminance levels of 300 LUX are/will be provided for screen-based tasks in offices and 500 LUX for paper-based tasks	Yes No Don't Know N/A	
WATER AND WASTEWATER MANAGEMENT			
WWM01 M1	Water Use Intensity (WUI) in litres or m ³ per person per year (or per day using 253 days per year) has been/will be established	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
WWM01 M2	Based on established WUI, the new premises do not/will not use more water than the existing premises or typical premises in the same location.	Yes No Don't Know N/A	
WWM02 M1	Water efficiency measures have been or are likely to be implemented to reach the required WUI	Yes No Don't Know N/A	
WWM03 M1	Water meter is/will be installed on the main water supply to the office.	Yes No Don't Know N/A	
WWM03 M2	Shut-off float valves are/will be installed to water tanks (where applicable)	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
WWM04 M1	Untreated wastewater is not/will not be discharged directly into water bodies	Yes No Don't Know N/A	
WWM04 M2	Surface water pollutants such as motor oil, vehicle wash run-off, and similar are/will be adequately contained and/or treated prior to discharge to a municipal drain or ground	Yes No Don't Know N/A	
BIODIVERSITY			
BIO01 M1a	This new office (where relevant) will be constructed on previously developed land (brownfield sites) with low ecological value.	Yes No Don't Know N/A	
BIO01 M1b	This existing office, where relevant, is located on a site with zero or low ecological value and away from protected areas and sensitive habitats.	Yes No Don't Know N/A	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
BIO01 M2	This new office is on a site that has been screened for the presence of non-native invasive species	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
BIO02 M1	The ecological value of site has been/will be evaluated using a BREEAM checklist provided within the IDEAs guidance (page 51)	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
BIO02 M2	Identified features of ecological value (if any) will be protected during construction, renovation and occupancy in line with recommendations from an ecologist, recognized 'local' ecological expertise or from relevant published guidance.	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	
BIO04 M1	Any new timber or timber-based products to be used in potential fit-out, renovation or construction of premises originates or will originate from a legally harvested and traded timber source as defined on page 57 of IDEAs guidance.	<p>Yes</p> <p>No</p> <p>Don't Know</p> <p>N/A</p>	

ID	Action / Statement	Yes / No / Don't Know / N/A	Comments
SUSTAINABLE PROCUREMENT			
SP01 M1	New premises and associated professional services and materials (where relevant) are procured in line with organizational sustainable procurement considerations outlined within existing corporate procurement policies, and guidance, AND relevant procurement department was contacted to provide the latest guidance.	Yes No Don't Know N/A	
SP01 M2	In the absence of sustainable procurement policies at organizational level, we have considered inter-agency Sustainable Procurement Indicators and incorporated at least one environmental, one social and one economic criterion ³⁶ .	Yes No Don't Know N/A	
SP02 M3	Green lease clauses are/will be included within lease agreements	Yes No Don't Know N/A	

36. <https://tinyurl.com/hezacOcf>

Annex 2: Green Building Standards Guidance

Introduction and Key Benefits:

Leading international standards, namely BREEAM, LEED and Green Star, have had a positive impact on the green building sector and the construction industry supply chain since the 1990's. Independent evidence³⁷ shows that certified buildings have a significantly lower environmental footprint and deliver value for money in terms of lower operational costs, tenant retention, return on investment, occupant wellbeing and productivity³⁸. In addition to numerous environmental, social and economic sustainability benefits, the use of the standards also offers the following advantages:

Measuring what is important:

The leading standards measure sustainability holistically, based on leading, independent, and the most recent scientific research on energy, climate, waste, water, biodiversity, pollution, land use, transport, wellbeing and materials. They measure aspects that are relevant to specific building types (e.g. offices, residential, warehouses), locations (e.g. climate, legislation) and building project types (e.g. new construction, refurbishment, existing building management, fit-out etc.)

Standardization and benchmarking:

The standards define quantitative and qualitative performance levels from minimum to best practice international performance, thus facilitating meaningful benchmarking and standardization.

Systematic and continuous improvement:

In relation to existing facilities, the standards can be used to credibly and accurately measure their baseline performance, identify areas for improvement and inform refurbishment/retrofit strategies. Through regular re-certification processes, the standards encourage continual improvement.

Credibility:

The standards are developed and operated by independent/non-governmental and often not for profit bodies with transparent and evidence-based certification processes. Typically, building owners/occupiers/developers need to register a building or a group of buildings with a certification body, submit evidence of compliance with detailed standard requirements and have that evidence verified by independent professionals working for or licensed by a certification body. A certification body issues a certificate stating

the level of performance achieved. Thus, certified building owners/occupiers/developers can claim independent, third-party verification of their environmental performance and credentials.

Choosing the standard

In addition to the aforementioned leading and the longest established standards, there are dozens of other green building standards to choose from internationally. Their scope can distinguish them in terms of geographical application (e.g. international, regional or local), range of topics (e.g. holistic or single attribute focused), range of scores and ambition (e.g. different levels of performance recognized or exemplary performance only), types of developments that can be assessed (e.g. new build, refurbishment, domestic, commercial) and cost of certification. Here is the summary of factors to consider when choosing a standard to follow:

Geographical location:

BREEAM and LEED are widely used across the globe, while Green Star is mostly used in Australia, New Zealand and Africa. There are also dozens of local or regional standards based on BREEAM/LEED or that follow a similar methodology. For example, Estidama in UAE, Casbee in Japan or Lotus in Vietnam. Furthermore, a number of standards that either

award exemplary performance only (e.g. Passive House, Living Building Challenge) or cover limited topics (e.g. WELL, EDGE, Passive House) can be used internationally³⁹.

Another aspect to consider when considering which standard to use in a specific location is local legislation and the supply chain's familiarity with a standard.

Topics:

Standards like BREEAM, LEED and Green Star address a wide range of environmental and social sustainability topics while standards such as Well (Health and Wellness), EDGE (Energy, Water and Embodied Energy) and Passive House (Energy and Thermal Comfort), focus on a limited number of topics.

Rating approach:

Holistic standards, such as LEED and BREEAM, provide a range of rating performance levels (e.g. Silver, Gold and Platinum or Very Good, Excellent and Outstanding) subject to meeting minimum requirements. While criteria within specific issues can be adapted to local conditions, performance tends to be evaluated against baseline international practice and standards. In other words, the goal is for a LEED Platinum building in one location to be as 'green' as a LEED Platinum building in another. Some standards, like Passive House or Living Building Challenge, reward exemplary international performance only. On the other hand, EDGE, developed by the International Finance Corporation (IFC) for emerging markets, assesses performance as an improvement over local rather than international legislative baseline.

Facility and project type:

Standards typically have different versions that are used to assess a range of facility types (e.g. offices, accommodation, warehouses) and project types (e.g. new build, refurbishment, fit-out, existing building operation). Standard versions and associated requirements can also vary depending on the project size and complexity. Therefore, selecting the correct version of a standard is essential, and expertise from a suitably qualified professional⁴⁰ is highly recommended.

Use of standards:

While the value of certification should not be underestimated, the standards can be used as reference guides and design tools only. They are subject to regular updates and thus provide a credible source of best practice to be used for benchmarking purposes. They also include tools or refer to specific best practice standards that can be used to model and evaluate performance across a wide range of issues such as indoor air quality, life-cycle cost, water consumption, lifecycle impact of resources, energy use or renewable energy feasibility. For example, EDGE standard provides an online life-cycle cost estimator tool, which can be useful for comparative analysis of different design proposals. BREEAM In-use standard provides a simplified, easy to use, energy-modeling feature within its online tool.

Seeking advice from a qualified expert (e.g. LEED Accredited Professional (AP), EDGE Expert or BREEAM AP or Licensed Assessor) is strongly recommended even when using standards as a design tool. A database of qualified professionals is usually provided on standard owner's web page.

Further information related to LEED, BREEAM, Green Star, Well and EDGE standards can be accessed here:

LEED: <https://www.usgbc.org/leed>

BREEAM <https://www.breeam.com/discover/technical-standards/>

Green Star: <https://new.gbca.org.au/green-star/rating-system/>

WELL: <https://www.wellcertified.com>

EDGE: <https://www.edgebuildings.com>

Cost:

For a fully certified development, the typical cost includes certification fees (see table above), assessor / AP consultancy fee and any capital cost (and potentially life-cycle cost saving) associated with improvement measures. The relevant certification body publicizes certification fees while consultancy fee is negotiated on a project-by-project basis. Table 1 above shows the certification cost comparison for different standards.

The cost of standard implementation will largely depend on when in the project cycle it is considered. Consideration of standards early during project briefing and conceptual design stage would maximize the implementation of zero and low-cost opportunities.

Standard	New Office Building			Existing Office Building		
	4,000m ²	20,000m ²	60,000m ²	4,000m ²	20,000m ²	60,000m ²
LEED	\$3,420	\$14,638	\$38,750	\$2,250	\$9,041	\$23,250
BREEAM	\$3,006	\$4,561	\$8,617	\$825	\$825	\$825
EDGE	\$2,250	\$6,750	\$11,000	\$2,250	\$6,750	\$11,000

LEED / BREEAM / EDGE certification fee cost comparison – December 2019

Conclusion

Leading international green buildings standards have played a significant role in driving the international green building sector since the 1990's. Dozens of UN buildings have already been certified, and those buildings tend to outperform non-certified ones across key environmental performance indicators, including greenhouse gas emissions, water and waste.

In the context of the 2030 vision for sustainability management in the UN and IPCC CO₂ targets, green building standards offer a robust and essential framework for implementing this necessary and challenging transformation.

To meet the associated goals, standards should be systematically implemented across all newly constructed, leased and renovated UN premises and should aim to achieve exemplar performance. In terms of actual ratings, exemplar performance is associated with LEED Platinum, BREEAM Outstanding, Green Star Six Stars and EDGE Zero Carbon, for example.

Achieving this level of performance across all UN facilities is challenging today, but with careful planning and necessary human and financial resources, it may become a reality by 2030.

Thus a decision today should not be whether to follow a credible international standard but which standard to follow in a particular setting based on

project type, size, location, budget and expected outcomes. Choosing the correct standard or standards to follow in a particular setting can be challenging, and expert knowledge and guidance are essential. Therefore, experts would typically carry out an initial analysis (i.e. pre-assessment), which would be used to facilitate informed decision making.

Given their credibility, scope that addresses topics covered by UN-wide strategy and international coverage, the three leading worldwide standards, BREEAM, LEED and GreenStar, should be prioritized when considering which standard to use.

For a quick overview of leading standards and associated features, please refer to the table below.

37. Supply, demand and the value of green buildings by RICS, 2020: <https://tinyurl.com/qkm4d4l>
38. Capturing the value of sustainability report by the UK Green Building Council (GBC), 2018: <https://tinyurl.com/robudj2>
39. The business case for green buildings by World GBC and Skanska, 2013: <https://tinyurl.com/y29xh8ys>
40. World GBC report with case studies of BREEAM, LEED and WELL-certified buildings and associated cost savings from wellbeing and productivity improvements: <https://tinyurl.com/t7jemf4>

	LEED	BREEAM	GreenStar	WELL	Passive House	EDGE
Ownership	USGBC	BRE Trust	GBCA; NZGBCA GBCSA	USGBC & IWBI	Passive House Institute	IFC
Geographical Coverage	Worldwide (167 countries with certified projects)	Worldwide (86 countries with certified projects)	Australia, Africa, New Zealand	Worldwide	Mainly Europe, North America, Asia	Most countries but mostly emerging economies
Certified Projects	124,000+	571,000+	3,300+	286	4,869	220
Scope	Holistic	Holistic	Holistic	Health & Wellbeing	Energy & Thermal Comfort	Energy; Water; Embodied Energy
Rating Levels	Certified; Silver; Gold; Platinum;	Pass; Good; V. Good; Excellent, Outstanding	1 to 6 Stars	Silver; Gold; Platinum	Certified	Certified; Advanced; Zero Carbon;
Key Advantages	Market appeal; International presence; Holistic; Credibility; Reputation; Benchmarking	Longest established; Holistic; International presence; Credibility; Reputation; Benchmarking; Low Certification Cost;	Credibility; Holistic; Reputation;	Appeal to building occupants; On-site performance measurement;	Exemplar performance; Prestigious label; Life-cycle cost savings;	Facilitates cost comparison; Relative simplicity; UN Family
Disadvantages	Cost; Complexity;	Complexity;	Geographically limited	Limited scope; Cost;	Limited scope;	Limited scope; Not practical for existing buildings;