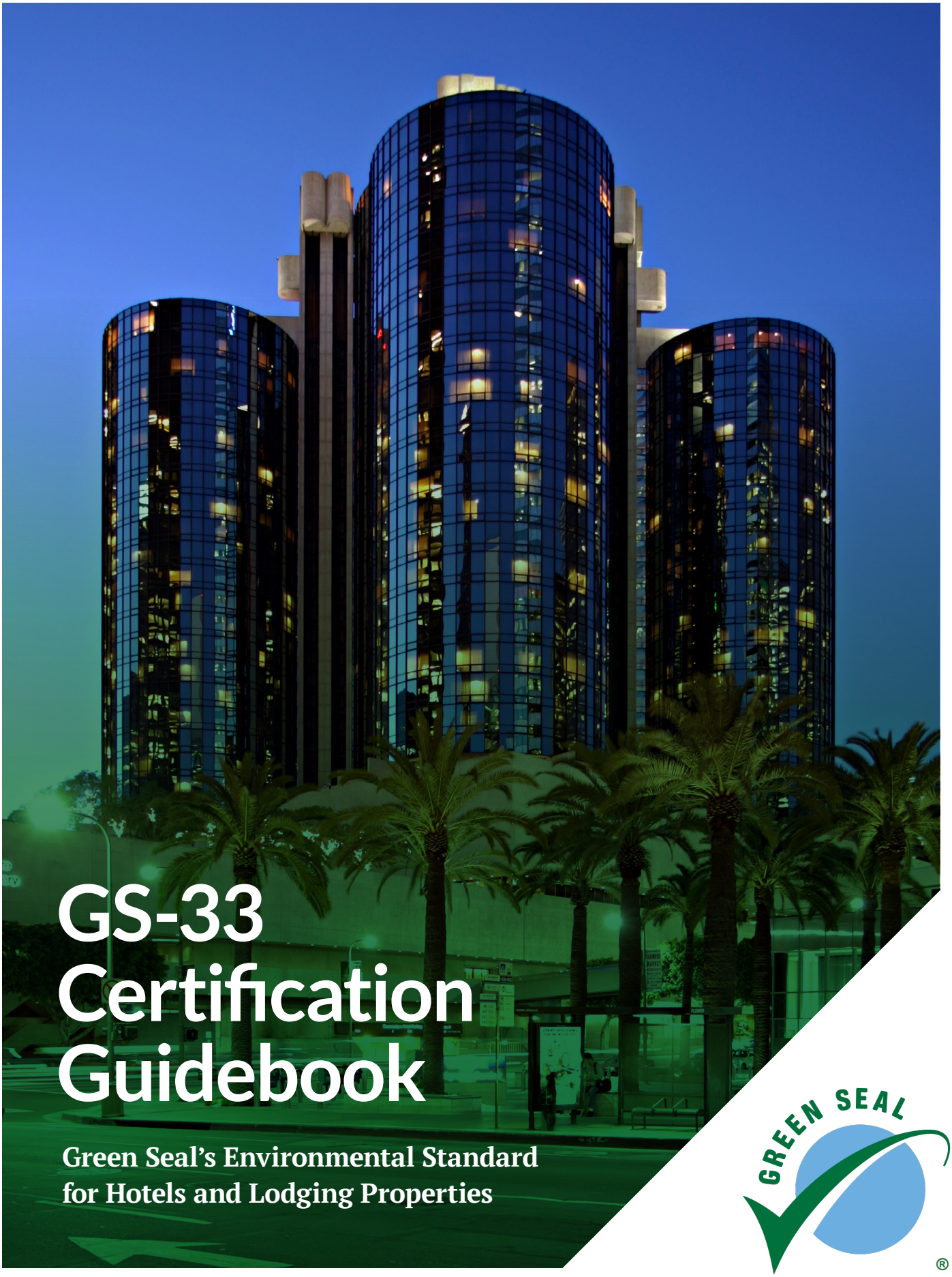

# GS-33 Certification Guidebook

## Green Seal's Environmental Standard for Hotels and Lodging Properties

GREEN SEAL®

**For questions about Green Seal standards and certifications:**

**CALL:** (202) 872-6400
**EMAIL:** customersuccess@greenseal.org
**VISIT:** www.GreenSeal.org

To apply for certification, review the steps at:
www.GreenSeal.org/GreenBusiness/Certification/GetCertified.aspx

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**www.GreenSeal.org**

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# Introduction

## Welcome! This guidebook is designed to accompany you through the process of preparing for and earning Green Seal™ certification under the Green Seal Standard for Hotels and Lodging Properties (GS-33).

Green Seal's Hotel and Lodging Certification provides property owners an achievable path toward sustainable operations, meeting the demands of your corporate offices, shareholders, and guests who are likely becoming increasingly motivated by protecting their health and our environment. These new market demands make it critical for you to prove that your hotel's operations achieve a healthier indoor environment and meet rigorous targets for energy, water, and waste management, all while continuing to provide high quality service, convenience, and comfort to your guests.

This Certification addresses the most significant lifecycle impacts for hotels and lodging properties to deliver increased health and environmental protections, and covers the following topics:

**Waste Minimization Tactics and Tracking**

**Pollution Prevention**

**Energy and Water Efficiency**

**Healthier Indoor Air through Procuring Safer Products**

**Reduction and Safe Storage of Hazardous Chemicals**

**Adopting and Implementing Green Purchasing Policies**

Green Seal's Hotel and Lodging Certification offers three rating levels: Bronze, Silver, or Gold. Each level includes progressively more rigorous requirements.

| | |
|---|---|
| BRONZE LEVEL | Contains essential leadership elements of a lodging operation. |
| SILVER LEVEL | Contains more comprehensive requirements for leadership operations in sustainability. |
| GOLD LEVEL | Incorporates additional criteria to recognize properties that are at the forefront of environmental leadership. |

To learn more about this certification, visit: www.GreenSeal.org/GS33

## Who Can Use This Standard?

**This standard applies to lodging properties including All Suites, Bed and Breakfasts, Condominiums, Condotels, Convention Hotels, Cottages, Country Inns, Extended Stay, Full Service, Hotels, Limited Service, Lodges, Motels, Motor Inns, and Resorts.**

This standard does not cover the following services:

| | | |
|---|---|---|
| Separate golf courses associated with the property | Separate restaurants associated with the property | Separate swimming pools associated with the property |

## Steps to Certification

1 **Submit Application**
The first step to begin the process of earning Green Seal's Hotel and Lodging Certification is to complete and sign an Application and submit payment for the review fee. Applications can be requested at www.GreenSeal.org/GS-33-Certification-Interest or made directly to your Green Seal Customer Success contact (if you have one).

2 **Select a Target Rating Level**
Green Seal's Hotel and Lodging Certification offers three rating levels: Bronze, Silver, or Gold. Review the requirements for each option, and determine which one is right for your property.

3 **Submit Documentation for Evaluation**
You will be assigned a Green Seal Project Manager to help you with the process of collecting and submitting project information and documentation that your property meets the requirements of the standard for your target rating level (Bronze, Silver, or Gold). Your Project Manager is available to help you ensure your documentation is complete and ready to submit, and will conduct the initial review of these materials in advance of your site audit. If any issues arise, your Project Manager will help you to resolve them.

4 **Schedule a Site Audit**
Once all documentation has been submitted and evaluated for conformity, a Green Seal representive will work with you to schedule a visit to your property and complete a site audit to visually verify the property is appropriately implementing the requirements of the standard.

5 **Undergo Quality Assurance Review**
One of Green Seal's senior project managers will double check the results of the certification evaluation. If any issues arise, your Project Manager will work with you to resolve them quickly.

6 **Achieve Certification**
Once all requirements are met, your Certification will be issued and you may begin promoting your property's Green Seal Certification! At this time, you will receive access to Green Seal's Marketing Toolbox and the appropriate Certification Logo for your property.

# How To Use This Guidebook

This guidebook is organized to follow the requirements in the Green Seal Standard for Hotels and Lodging Properties (GS-33) Edition 5.3, issued June 6, 2017. All requirements from Edition 5.3 are provided in this guidebook. Keep in mind, this guidebook is designed to help you successfully implement the requirements of the standard; it does not replace the standard in defining the requirements for certification, and does not guarantee certification.

Each entry in this guidebook contains the following sections:

**Applies to**
A checkmark designation of which rating tier(s) must comply with the requirement.

**Intent**
A brief explanation of the purpose for the requirement and how it reduces impacts to human health and the environment.

**Standard Requirements**
The complete standard requirements for each criterion, as found in the Green Seal Standard for Hotels and Lodging Properties (GS-33) Edition 5.3, issued June 6, 2017. Note, Section 2.7 includes additional requirements for Gold Level projects only.

**Implementation Options**
A set of suggestions for how your property may choose to comply with the requirements. Keep in mind, the methods described in this guidebook are examples to help ensure your property's success at achieving a requirement. The suggestions in this section are not meant to describe the only way for your property to meet the requirement.

**Documentation Needed**
The list of documentation required to verify compliance with each requirement. In general, documents include narrative explanations or descriptions, established policies, copies of purchasing orders or receipts, photographic evidence, or information provided in a template developed by Green Seal. Electronic documents (e.g., PDF, Word, JPEG, Excel, scanned originals) are preferred to creating paper copies.

**On-Site Auditor Visit**
The list of items an auditor may visually inspect during the on-site visit to verify compliance with requirements. In addition, the auditor may ask staff questions to better understand how a particular process, procedure, or policy is implemented on-site.

In addition to the above sections, you will find *italicized terms* throughout the document. This designates a definition that can be found in Annex A.

# 1.0 – Organization and Regulatory Compliance

## 1.1 – PROPERTY INFORMATION

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To gather basic information about the property, which may be necessary for calculations and determining how to achieve other requirements within the standard.

### Standard Requirements

Provide the following details about the property:

- year of construction
- year of most recent renovation (if any)
- property size (in square feet)
- number of guest rooms
- any notable property-specific information

### Implementation Options

Obtain the necessary property details to complete Template 1.1: Property-Specific Information.

Notable property-specific information includes any information that may impact the way in which other requirements within the standard are interpreted and implemented. Check with your Project Manager if you are unsure whether a unique attribute of your property constitutes notable information.

### Documentation Needed

Complete and upload Template 1.1: Property-Specific Information, which requires the following information:

- year of construction
- year most recent renovation (if any)
- property size (in square feet)
- number of guest rooms
- other property-specific information (of note)

### On-Site Auditor Visit

No action needed.

# 2.0 – Environmental Requirements

**This section includes requirements on the following topics:**

- 2.1 Waste Minimization, Reuse, and Recycling
- 2.2 Energy Efficiency, Conservation, and Management
- 2.3 Management of Freshwater Resources
- 2.4 Hazardous Substances
- 2.5 Purchasing
- 2.6 Continual Improvement
- 2.7 Additional Requirements for Gold Level Properties

**For each criterion, consider who needs to be involved in necessary discussions regarding the following:**

- Whether the property currently conforms to the requirements listed.
- Any changes necessary to successfully comply with the requirements.
- How to produce the documentation needed to demonstrate compliance with requirements.
- Who is responsible for any ongoing tracking and maintenance of documentation, records, or product information.
- The appropriate personnel to be available for the on-site audit.

## 2.1 – WASTE MINIMIZATION, REUSE AND RECYCLING

Waste minimization is the source reduction and/or environmentally sound methods used to reduce the amount of material that ultimately enters a landfill as waste.[1] According to the U.S. EPA, more than 268 million tons of solid waste was generated in the United States (about 4.5 pounds per person per day), only about 35 percent of which was recycled or composted.[2] Consumers often dispose of waste products within building properties; providing clear opportunities for them to send their waste to the appropriate stream (i.e., recycling, compost, landfill) will ultimately decrease the otherwise recoverable materials from entering landfills.

### 2.1.1 – RECYCLING PROGRAM

**Applies to**

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

**Intent**

To decrease the amount of recoverable materials entering landfills, and instead serve as inputs for the manufacture of other usable materials.

**Standard Requirements**

The property shall establish a recycling program and track its implementation.

- **2.1.1.1** – Materials that are cost-effective for the property to recycle shall be included in the program.
- **2.1.1.2** – Clearly labeled sorting containers shall be placed in appropriate areas where these materials are collected and stored, with access for both customers/guests and staff.
- **2.1.1.3** – Records shall be kept for the monthly or quarterly totals of recycled materials, in order to measure effectiveness and provide evidence of tracking.
- **2.1.1.4** – Aerosol cans shall be recycled if they are accepted for recycling by the community recycling program.

The records shall summarize how much material was recycled for the entire property during the tracking period: records of individual collections (e.g., invoices from waste management companies) shall be aggregated into monthly or quarterly amounts.

**Implementation Options**

Consider conducting an initial waste assessment to identify the quantity and composition of materials in your waste stream. The U.S. EPA provides guidance on best practices for conducting a waste assessment.

Use the StopWaste Guidelines for Recycling, Organics, and Refuse Services to assist with planning collection locations, considerations for exterior enclosures, and unique considerations for successfully implementing a recycling program in taller buildings.

**2.1.1.1** – Contact your local waste hauler(s) to determine what materials are collected and may be eligible for recycling in your area. Inquire which materials can be comingled and whether any materials must be collected

[1] *https://archive.epa.gov/epawaste/hazard/wastemin/web/html/faqs.html*
[2] *https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/national-overview-facts-and-figures-materials*

and stored separately. Common materials such as aluminum, plastic, cardboard, paperboard, print and copy paper, steel, glass, newspaper, mixed paper, batteries, packaging, inkjet and toner cartridges and fluorescent light bulbs may be collected by haulers. In addition, consider other items that might be reused or recycled such as mattresses, linens, furniture, etc. Recycle all material that is cost-effective to recycle.

**2.1.1.2** – Place recycling containers adjacent to trash containers in appropriate areas where these materials are collected (i.e near vending machines, near elevators, the lobby, inside or outside of conference rooms, guest rooms, etc.), with access to both staff and guests. Clearly label all containers so guests and staff know what can and cannot be recycled. When possible, include images in addition to text of appropriate materials for each bin.

**2.1.1.3** – Develop a system to track monthly or quarterly totals of recycled materials. Your waste hauler should be able to provide you with information regarding your recycled materials. In addition, consider using the waste tracking functionality in the ENERGY STAR Portfolio Manager along with their communications toolkit to let colleagues, stakeholders, and customers know about your waste reduction efforts.

### Documentation Needed

Complete and upload Template 2.1.1: Recycling Process to provide information on each type of material being recycled, the location of storage bins, and confirming whether the bins are clearly labeled.

Provide the property's most recent records of total recycled materials, including aggregated monthly or quarterly data. Data displayed in spreadsheets, charts, graphs, or tables is acceptable.

For properties seeking exemption from these requirements based on the cost of recycling, provide a cost justification including the waste hauler fees for landfill waste and for collection of recyclables.

### On-Site Auditor Visit

The auditor will check for recycle bin placement in appropriate areas (i.e near vending machines, near elevators, the lobby, inside or outside of conference rooms, guest rooms, etc.) and ensure they are clearly labeled. The auditor may also check the waste stream to see if recyclable materials are being properly disposed.

## 2.1.2 – COMPOSTING PROGRAM

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To encourage the composting of food and yard waste in order to decrease material sent to landfills. The U.S. EPA estimates that 40.7 million tons of food waste was generated in 2017, or 15.2 percent of total municipal solid waste generation.[3] Only 6% of food waste is currently diverted from landfills and combustion facilities.[4] Forty percent of food waste originates from consumer-facing businesses, including restaurants and hotels.[5]

### Standard Requirements

- **2.1.2.1** – The property shall compost food and yard waste through local operations, where available and cost effective.
- **2.1.2.2** – Clearly marked sorting containers shall be placed in areas where compostable waste is collected and stored.

### Implementation Options

The World Wildlife Fund has created Hotel|Kitchen, a free food waste reduction toolkit for hotels, which provides comprehensive guidance on how to reduce food waste while maintaining a high quality guest experience.

Conduct a waste audit to determine how much food and yard waste the property is producing. Use the U.S. EPA's Tools for Assessing Wasted Food and Guide to Conducting and Analyzing a Food Waste Assessment to serve as a guide for this exercise. Set food and yard waste reduction goals. In addition, review the amount of single-use products such as to-go containers, coffee cups, utensils, gloves for food prep. Review and consider procuring certified compostable options for these products.

Determine what composting facilities and options are available in your area, and which materials they collect for composting. The U.S. EPA maintains a list of food waste diversion options by region.

Ensure containers for collecting compostable materials are clearly marked and placed in areas where this waste is collected and stored, such as kitchen areas, restaurants, landscape areas, etc. Consider providing education to personnel and guests that introduces them to composting and what materials are acceptable for collection on your property.

### Documentation Needed

Complete and upload Template 2.1.2: Composting Program, which requires information on each type of material being composted, the location of the bins to collect each item, and confirmation that the bins are clearly marked.

[3] *https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/food-material-specific-data*
[4] *https://www.epa.gov/sustainable-management-food/wasted-food-programs-and-resources-across-united-states*
[5] *https://hotelkitchen.org/about-toolkit/*

For properties unable to meet these requirements, provide a cost justification for this exemption, including the waste hauler fee for landfill waste as compared to the waste hauler fee and cost of additional staff for collection of compost waste. Green Seal will be looking for exact, specific *cost-effective* calculations as acceptable justification for why a property is electing not to compost.

### On-Site Auditor Visit

The auditor will check to see that compost bins are available in kitchen areas and other areas where food and yard waste is generated and that the compost bins are clearly marked. The auditor may also check the waste stream to see if compost materials are being disposed of properly.

## 2.1.3 – REFILLABLE AMENITIES

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To conserve resources and reduce waste generated by hotel guests. It is estimated that each hotel guest generates about 2 pounds of waste per night, with paper, cardboard, and plastic accounting for more than half their waste production.[6] According to the American Lodging and Hotel Association, "hotels can save $.16 per guest room per day in water, labor and product costs by replacing amenities in individual bottles or wrappers with two refillable amenity dispensers per guest bathroom: one each for the shower and sink areas."[7]

### Standard Requirements

**2.1.3.1** – The property shall:

- Use refillable amenity dispensers rather than individual containers for shampoo, conditioner, soap, lotion, etc., where possible.

***OR:***

- The property shall demonstrate that the individual containers it has chosen are:
  - the smallest practical size (see below) for the guests' length of stay ***AND***
  - packaged in recycled or recyclable materials, using minimal amounts of packaging.

**2.1.3.2** – Partially-used packages of amenities shall be donated to charity or recycled, where feasible.
The following sizes are considered practical, unless the property can demonstrate otherwise:

| | | |
|---|---|---|
| Facial Soap | ¾ – 1 oz | 20 – 30g |
| Bar Soap | 1 – 1.25 oz | 28 – 35g |
| Bath Soap | 1.25 – 1.75 oz | 35 – 50g |
| Bottles | 1 – 1.5 fl. oz | 30 – 55mL |

### Implementation Options

**2.1.3.1** – Contact your current vendors to discuss whether refillable amenities are an option.

If refillable amenities are not available, determine the average guest length of stay to decide whether or not the amenity bottle is the smallest practical size.

Look for plastic amenity containers noted with #1, #2, #4 and #5 recyclable (these numbers meet Green Seal's requirements for recyclable) or packaged in recycled materials (look for both pre-consumer and post-consumer content).

**2.1.3.2** – If partially-used amenities can be recycled in your area, do so. Otherwise, look for charities that will accept partially-used amenities.

[6] *https://www.greenhotelier.org/our-themes/waste-management/*
[7] *https://www.ahla.com/resources/green-guidelines-refillable-amenities-4*

## Documentation Needed

Complete and upload Template 2.1.3: Refillable Amenities, which collects the following information for facial soap, bar soap, bath soap, shampoo, conditioner, and lotion:

- whether a refillable dispenser is used
- if individual containers are used, size (in ounces)
- whether the partially-used amenity is recycled or donated
- the type of container used for the amenity (for plastics, provide the SPI code)

If partially-used amenity bottles are recycled, ensure this information is included in Template 2.1.1: Recycling Process.

For donated partially-used amenities, provide receipts, written statements from charities (on their letterhead), or other documented proof that the property has donated amenities to the charity.

## On-Site Auditor Visit

The auditor will spot check to see if refillable amenities are installed or if individual amenities are available, and that they are appropriately sized. The auditor may ask to observe where partially-used amenities are collected and about the procedures for collection and pick up.

### 2.1.4 – DOUBLE SIDED PRINTING

#### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

#### Intent

To reduce the consumption of paper, which decreases the negative impacts on forests and greenhouse gas emissions, and can reduce storage/inventory costs for hotel properties.

#### Standard Requirements

The default setting for copying shall be double-sided. Paper printed only on one side shall be used for internal copies/printouts/notepads.

#### Implementation Options

All computers and copiers/printers should be set to default to double-sided printing.

Consider adopting U.S. General Services Administration and the EPA recommended defaults to further reduce paper and ink consumption:

- Use "Shrink to Fit" or "Shrink One Page" for print jobs.
- Print multiple slides or pages from a presentation or document on each page.
- Review jobs in print preview and print only the necessary pages.
- Remove unneeded content from print jobs.
- Remove unnecessary backgrounds, shading and graphics from print jobs.
- Print in color only when necessary.
- Use the following default document settings:
  - Margins of [0.5"] on each side
  - Line spacing of [1.0]
  - Font type [Calibri]
  - Font size [11]

Communicate default settings to staff as part of training or in the form of clearly posted signs, as well as to hotel guests within business centers with printing equipment.

#### Documentation Needed

None. Compliance confirmed during On-Site Auditor Visit.

#### On-Site Auditor Visit

The auditor may spot-check the copiers and printers and surrounding areas to check that the default setting is double-sided and will verify that one-sided printed paper is being re-used by staff for internal copies/printouts/notepads.

## 2.1.5 – FOOD DONATION

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To minimize the amount of food waste that is sent to the landfill and to help serve the public good.

### Standard Requirements

The property shall donate leftover food to a local shelter or food bank, where programs are available and where permitted by local regulatory agencies.

### Implementation Options

Conduct research to determine if your local regulations allow for food donation. In the United States, the Bill Emerson Good Samaritan Food Donation Act (Pub.L. 104-210, 110 Stat. 3011, enacted October 1, 1996) protects hospitality companies from liability. Therefore, the only acceptable exception to this requirement is if the property can prove no local organization will accept their food donation.

Seek out out and contact area shelters, food banks, churches, or other organizations that distribute food to those in need, to see if they accept food donations. If no other option is available, the property may make leftover food available for staff, or incorporate it into new dishes to keep the food from entering the waste stream.

FoodShift provides food donation guidelines and special considerations for prepared foods, packaged perishable foods, baked goods, and more to better ensure the donated food is indeed acceptable for use. In addition, the U.S. EPA administers the Food Recovery Challenge which helps participants prevent and divert wasted food in their operations to those in need in their local area.

### Documentation Needed

- Provide a narrative description of the food donation program.
- If food donation is not possible, provide a narrative description of the reasons why.

### On-Site Auditor Visit

Auditor will ask about procedures for donation and see where food is stored.

## 2.1.6 – FOOD SERVICE ITEMS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce the waste generated by disposable food service items, which contributes toward the 50.7 million tons of nondurable goods found in municipal solid waste streams each year[8], and to encourage the use of reusable cups, glasses, cutlery, bowls and plates, particularly in guest rooms and common areas.

### Standard Requirements

The property shall minimize the use of disposable food service items.

The property shall maintain records listing the services and locations where disposable items are in use, providing justification for each use of disposable items.

Plastic or paper cups may be permitted in guest room bathrooms due to the risk of breakage.

### Implementation Options

Identify disposable food service items and where they are provided on the property (guest rooms, lobby, conference center, meeting rooms, etc.). Assess whether disposable items can be replaced with a reusable option. For example, in guest rooms that are equipped with a coffee maker, can a reusable coffee mug be made available? Could condiments or coffee supplies be available through self-serve dispensers in common areas, rather than individual packets?

For to-go needs, a disposable cup with lid may also be provided, but should not be the only option available. For operations that have food service items for staff, reusable options should be considered and used where feasible.

In addition, consider whether compostable options that are third party certified through the Biodegradable Products Institute (BPI) are available and would meet the needs of the property.

### Documentation Needed

Complete and upload Template 2.1.6 Food Service Items, which requires information on where disposable items are in use, the type of disposable item, and an assessment of whether that item can be replaced with a reusable option.

### On-Site Auditor Visit

The auditor will check areas where disposable items are in use and discuss with the hotel whether those items could be replaced with reusable items.

[8] *https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/nondurable-goods-product-specific-data*

## 2.2 – ENERGY EFFICIENCY, CONSERVATION AND MANAGEMENT

Energy efficiency, conservation, and management is a critical component of a hotel property's commitment to sustainability. According to the Alliance to Save Energy[9], commercial and residential buildings account for 40 percent of U.S. energy use, and 70 percent of electricity use. Buildings are responsible for more than 1/3 of the greenhouse gas emissions in the United States, which is the single largest contributing sector of the economy. According to the 2015 edition of *Trends® in the Hotel Industry*, electricity is the largest utility expense comprising 60 percent of total expenditures.

### 2.2.1 – ENERGY-CONSUMING DEVICES

**Applies to**

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

**Intent**

Encourage properties to identify and implement opportunities to lower utility usage and costs by switching to more efficient devices and systems, thereby reducing their greenhouse gas emissions and contribution to climate change.

**Standard Requirements**

The property shall maintain a list of energy-consuming devices, including guest-room equipment, office electronics, HVAC systems, and kitchen and laundry equipment (see Appendix 4).

**Implementation Options**

Make a list of all energy-consuming devices at the property; update this list with each new purchase and keep as on-going record. Appendix 4 provides a list of energy-consuming kitchen equipment.

The U.S. Department of Energy offers an Appliance Energy Calculator to provide information on estimated use and cost per year. This tool can help hotel properties plan for how new energy consuming equipment may impact costs and operations.

**Documentation Needed**

Complete and upload Template 2.2.1 Energy Consuming Devices, which requires the list of energy consuming equipment, including guest room equipment, office equipment, HVAC systems and kitchen and laundry equipment where applicable.

**On-Site Auditor Visit**

The auditor may review the list of equipment and compare it to equipment identified on site.

[9] *https://www.ase.org/initiatives/buildings*

## 2.2.2 – INDOOR LIGHTING

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce the amount of energy consumed by indoor lighting, which accounts for the single largest electricity use in U.S. commercial buildings.[10]

### Standard Requirements

The property shall meet either 2.2.2.1 or 2.2.2.2:

**2.2.2.1** – All indoor lighting shall be energy-efficient.
***OR***
**2.2.2.2** – The property shall implement a replacement schedule for indoor lighting:

- All indoor lighting shall be on a schedule for replacement with energy-efficient lighting, to be completed within five years from the first date of certification to this standard. Priority shall be given to the replacement of lights that are typically on for 24 hours/day, followed by lights typically on for 8+ hours/day.
- The property shall maintain records of all indoor lights that are not energy-efficient and their schedule for replacement.

Lighting fixtures that are clearly historic in nature, specialty light fixtures (e.g., display or accent lighting), or dimmable lighting may be exempt from this requirement if the property can demonstrate that the available options are not compatible, not cost-effective, or do not provide satisfactory performance.

### Implementation Options

**2.2.2.1** – Create a list of indoor lighting and note which ones are not energy-efficient. In the United States, products shall be identified as being in the lowest quarter (1/4) of energy used according to the FTC's yellow EnergyGuide labels (http://www.consumer.ftc.gov/articles/0072-shopping-home-appliances-use-energyguide-label), verified as *environmentally-preferable*, or otherwise demonstrate that they consume significantly less energy when compared with similar equipment using established, industry-standard testing methods.

Replace all lighting to energy-efficient options.

If the property has a procurement policy that specifies indoor lighting, ensure the policy is modified to incorporate requirements for energy-efficiency.

**2.2.2.2** – Develop a replacement schedule for all lighting that is not energy-efficient. The lighting replacement schedule should prioritize lighting in the following order:

- lights on 24 hours per day (hallways, exit signs, lobby lights, etc.)
- lights on for 8+ hours per day (restrooms, staff offices, meeting rooms, etc.)
- the lights that are used less often (such as guest rooms)

Maintain ongoing records of indoor lights as they are replaced.

[10] *https://www.eia.gov/energyexplained/use-of-energy/commercial-buildings.php*

Consider tracking energy use within ENERGY STAR Portfolio Manager, which provides a comprehensive tool for property managers to track, manage, and reduce energy use over time.

### Documentation Needed

Complete and upload Template 2.2.2 Indoor Lighting, which requires identifying each light location, whether the lights are energy efficient, and the replacement schedule for non-efficient lighting.

Where specialty light fixtures and historic or dimmable lighting cannot be replaced, provide a narrative explanation or cost justification for the requirements exemption.

### On-Site Auditor Visit

The auditor may review the list of indoor lighting fixtures/bulbs and spot check the lighting that is installed in the property.

## 2.2.3 – APPLIANCES AND HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) SYSTEMS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To maximize energy efficiency and extend equipment life for HVAC systems, which combined account for nearly 35 percent of a commercial building's electricity use[11], directly impact guest experience and comfort, and require substantial capital expense to replace.

### Standard Requirements

The property shall implement a regular preventative maintenance schedule for HVAC systems, in-room air conditioning units, and appliances for kitchen and laundry (for both the facility and the guests). This schedule shall be appropriate for each type of equipment and intended to ensure its proper operation.

### Implementation Options

Determine what regular maintenance is appropriate for HVAC systems, in-room units and kitchen and laundry appliances, based on manufacturer instructions, owners'/users' manuals or industry practice, and implement a regular preventative maintenance schedule. ENERGY STAR provides a maintenance checklist to prevent issues with heating and cooling systems. The maintenance schedule should be modified from corporate policy to be specific to the property (e.g., modified for occupied guest rooms). Train the appropriate staff on the procedures.

For kitchen and laundry appliances, create an inventory of existing appliances owned by the organization that includes the make and model of the appliance, the department in charge of maintaining the appliance, and the age of the appliance. When new purchase needs arise, procure those that are labeled as more energy efficient. For example, purchase new appliances that are ENERGY STAR certified, using the most recent version of the ENERGY STAR certification system in effect at the time of purchase. In addition, ensure appliances use the ENERGY STAR setting as the default.

For more information, see the EPA's directory of ENERGY STAR certified products.

Consider tracking energy use within ENERGY STAR Portfolio Manager, which provides a comprehensive tool for property managers to track, manage, and reduce energy use over time.

### Documentation Needed

Recent, completed, signed and dated records or screenshots from software programs, such as HotSOS, of preventative maintenance tasks performed, including frequency of maintenance, action item completed and any accompanying checklists.

### On-Site Auditor Visit

Auditor will ask questions about the Preventative Maintenance program to ensure it is being implemented and carried out according to schedule.

[11] *https://www.eia.gov/energyexplained/use-of-energy/commercial-buildings.php*

## 2.2.4 – CLIMATE AND LIGHTING CONTROL

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce the amount of energy used and costs incurred for lighting and HVAC in low traffic and low occupancy areas. Lighting and HVAC combined account for over 50 percent of a commercial building's annual electricity use.

### Standard Requirements

On/off timers and/or sensors shall be used for lighting and HVAC in low traffic and low occupancy areas.

### Implementation Options

Identify all low traffic and low occupancy areas of the hotel (e.g. back of the house, corridors, meeting rooms, storage rooms, equipment rooms, and exercise room).

For lighting control options, use the U.S. Department of Energy's Guide on Lighting Controls to understand basic lighting terms and principles and explore lighting control options that would best meet the needs of the property.

Once the ideal options for the property have been identified, install on/off timers or sensors for HVAC and lighting in low traffic and low occupancy areas.

### Documentation Needed

Complete and upload Template 2.2.4, which requires the list of low traffic and low occupancy areas and identifying whether lighting and HVAC controls have been installed.

### On-Site Auditor Visit

The auditor will be looking for on/off timers and/or sensors in low traffic and low occupancy areas.

## 2.3 – MANAGEMENT OF FRESH WATER RESOURCES

Water efficiency, conservation, and management is a critical component of a hotel property's commitment to sustainability. According to the U.S. Energy Information Administration, commercial lodging facilities are among the most water intense commercial building types per square foot, behind only buildings used for healthcare and public safety. In addition, water use intensity varies little by year of construction, meaning there are significant opportunities for new and old buildings alike to decrease their water use intensity.[12]

According to the 2015 edition of *Trends® in the Hotel Industry*, water is the second largest utility expense comprising nearly 25 percent of total expenditures. Studies indicate that hotels use 100-200 gallons of water per occupied guest room per day. Hotel properties have a significant opportunity to manage and increase water efficiency to reduce impacts and save money while still meeting guest experience needs.

### 2.3.1 – WATER-EFFICIENT FIXTURES

**Applies to**

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

**Intent**

To increase the use of water efficient fixtures in order to conserve freshwater resources and reduce operating costs.

**Standard Requirements**

All fixtures shall be WaterSense® labeled or have flow rates that do not exceed the following specifications:

- Faucets and aerators: 2.2 gpm or less
- Showerheads: 2.5 gpm or less
- Toilets: 1.6 gpf or less

Existing showerheads, faucets, and aerators that exceed these flow rates shall be on a schedule for replacement to be completed within two years from the first date of certification to this standard.

Existing toilets that exceed these flow rates shall be replaced in conjunction with major room renovations. The property shall maintain records of the schedule for these major renovations.

Some faucets may be exempt from this requirement, where the property can demonstrate that high flows are required (e.g., for filling pots, sinks, or bathtubs).

Higher flow toilets may be exempt from this requirement if the plumbing infrastructure will not function adequately with lower flow rates.

**Implementation Options**

Review the product documentation for faucets and aerators, showerheads and toilet fixtures throughout the property, which can usually be found in the Engineering department to identify the flow rates of each fixture and fitting as well as whether it is WaterSense labeled. Product data can also be found on the manufacturer's website. Maintain information on fixture and fitting flow rate on site or electronically, as they are required for certification.

[12] *https://www.eia.gov/consumption/commercial/reports/2012/water/*

For any fixtures that exceed the required flow rates, create a replacement plan to be completed within two years from the hotel's certification.

Toilets that do not meet the requirements should be replaced during the next major renovation. Create a timeline for the next property renovation and include the associated toilet replacement.

The U.S. EPA has launched the WaterSense H2Otel Challenge to help hotels understand their water use impact, and savings opportunities, find the right WaterSense and water efficient products for their property, and track water savings progress over time.

For more information on WaterSense® visit: www.epa.gov/watersense/.

### Documentation Needed

Complete and upload Template 2.3.1 Water Efficient Fixtures, which collects information on showerheads, toilets, kitchen faucets, guestroom faucets, public toilets, guestroom toilets, and other water consuming fixtures, including indicating WaterSense labeled or the flow rate, the replacement schedule for non-compliant fixtures, narrative description for exempt fixtures and fittings, and a link to the product sales page.

Compile and submit product data sheets that state either WaterSense® labeled or flow rate.

If infrastructure does not adequately function with a lower rate, an attestation by the plumbing contractor or other authority must be submitted.

### On-Site Auditor Visit

The auditor will spot-check to see if water-efficient fixtures are installed in guest rooms, general restrooms, and kitchen.

## 2.3.2 – LANDSCAPING AND IRRIGATION

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce the water used for on-site landscaping. According to the U.S. EPA, some experts estimate that as much as 50 percent of water used for irrigation is wasted due to evaporation, wind, or runoff caused by inefficient irrigation methods and systems.[13]

### Standard Requirements

When new plants are added to exterior areas, the property shall plant only those species of trees and other vegetation that require minimal irrigation.

The property shall maintain records showing that all trees and other plant species that it plants outdoors are:

- native to the area

***OR***

- tolerant of local climate, soils and natural water availability

Grasses that require irrigation shall be planted only in areas that are accessible to guests.
Irrigation practices shall include water-saving procedures. The minimum requirements are:

- using soaker hoses or drip irrigation for plant beds
- mulching plants to retain water
- watering plants in the early morning or at night to minimize evaporation

Alternative irrigation practices may be substituted if they are shown to save comparable amounts of water.

### Implementation Options

Inventory the current makeup of the outdoor space and determine whether existing species are native or climate, soil, and water tolerant. Before purchasing new exterior plants and trees, determine if they are native to the area or tolerant of local climate, soils and natural water availability. Ask local nurseries or your landscape company for advice on compliant plants and trees.

Determine which water-saving procedure(s) are most appropriate and effective for the property's plants and trees in consultation with a landscaper or landscape architect if necessary. For example, determine whether there are opportunities to incorporate xeriscaping principles could meet your property's landscaping design needs while dramatically reducing water use.

The U.S. EPA has developed a Water Efficiency Management Guide for Landscaping and Irrigation, which provides guidance on how to understand the property's current outdoor water use, how to prepare a site and select plants to minimize water use, and additional considerations for irrigation and water savings. In addition, the EPA's Water-Smart Landscapes Guide[14] to identify cost-saving measures to reduce landscaping water use and key tips to achieve a water smart landscape.

[13] *https://19january2017snapshot.epa.gov/www3/watersense/pubs/outdoor.html*
[14] *https://www.epa.gov/sites/production/files/2017-01/documents/ws-outdoor-water-efficient-landscaping.pdf*

### Documentation Needed

Complete and upload Template 2.3.2 Landscaping and Irrigation, which requires a list of new plants and tree types, indicating whether they are native to the area, indicate whether they are climate, soil, and water tolerant, and any relevant water-saving procedures used for irrigation.

### On-Site Auditor Visit

The auditor will verify that new plantings in the exterior landscaping do not require additional watering due to non-native plants or grasses in areas where no guest activities take place. The auditor will review the watering method employed (such as soaker hoses) and mulching.

## 2.3.3 – GROUNDSKEEPING

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce the amount of water used for groundskeeping. Outdoor water use, including groundskeeping, can account for nearly 30 percent of a building's total water use.

### Standard Requirements

Hard surfaces such as sidewalks, drives, parking lots, etc. shall not be washed down with potable water. Alternative methods shall be used, such as sweeping, cleaning with machines that recycle the wash water, or other options that minimize water use.

### Implementation Options

Create a procedure for the hotel that will keep sidewalks, drives, parking lots, etc., clean without using potable water. Alternatives include sweeping, using rainwater or gray water, and/or machines that recycle the wash water. The U.S. EPA provides guidance on on-site non-potable water reuse opportunities.

Limited use of pressure washers, auto scrubbers or steam cleaning devices is permitted to remove gum, oil and grease or biological material.

### Documentation Needed

Provide a narrative description of groundskeeping procedures to clean hard surfaces without using potable water.

### On-Site Auditor Visit

The auditor will observe practices in place and may ask questions about the procedures to staff responsible for groundskeeping.

## 2.3.4 – TOWEL AND LINEN REUSE PROGRAM

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To minimize the use of detergents, energy, and water from laundering towels and linens. Laundry accounts for 16 percent of a hotel's water use, requiring energy for water heating and additional demand on water and chemical resources. According to reporting by National Geographic, The American Hotel and Lodging Association estimates that the towel and linen reuse reduces the number of loads of laundry washed—as well as the related water, sewer, energy, and labor costs—by 17 percent.[15]

> Cutting back on laundry expenditures—water-wise and energy-wise—brings results. When Caesars in Las Vegas installed more efficient laundry facilities and began emphasizing its mission to conserve water, it saved around 30 million gallons of water in a year, which translates into "a savings of about $135,000 to $218,000 per year" on water heating.
>
> www.nationalgeographic.com/news/energy/2014/02/140224-hotels-save-energy-with-push-to-save-water/

### Standard Requirements

The property shall offer multiple-night guests the option to reuse towels and linen. An exception may be permitted if the property can demonstrate that this option is not *cost-effective*.

### Implementation Options

For multiple night guests (2 or more consecutive nights), create a procedure for a towel and/or linen reuse program.

Determine how housekeeping staff will implement the program and how the property will communicate the program to guests.

Train the staff on how to implement the program and create signs or communication materials to educate guests.

Consider an incentive program such as a drink coupon or loyalty points for guests who participate in the program.

Consider including a quality control aspect, such as a spot-check by hotel staff to ensure that guests who request "no change" have not had their towels or linens changed. If implementing an internal spot check procedure, document the spot-check results as part of the monitoring of the program.

### Documentation Needed

- Narrative description of towel and linen reuse program.
- If property elects not to offer a towel and linen reuse program, a cost justification is required.

[15] *https://www.nationalgeographic.com/news/energy/2014/02/140224-hotels-save-energy-with-push-to-save-water/*

### On-Site Auditor Visit

The auditor will spot check guest rooms for signs or other methods to explain the program and may have conversations with housekeeping staff to ensure that the staff know the procedures for the towel and/or linen reuse program.

## 2.3.5 – WASHING CAPACITY

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To maximize water and energy-efficiency from appliance use and to decrease water and energy consumption.

### Standard Requirements

The property shall ensure that washing machines, dryers, and dishwashers are filled to the recommended capacity for each cycle, and that the coolest effective water temperature is used.

### Implementation Options

Ensure washing machines, dryers and dishwashers are filled to the recommended capacity for each cycle. Consult the manufacturer's manuals for guidance.

Use coolest effective water temperature. Consult detergent or manufacturer manuals for guidance.

Some properties use a scale to measure clothing loads by weight, while other machines are designed not to run until a certain capacity is met.

Inform staff of procedures for washing machines, dryers, and dishwashers.

### Documentation Needed

Narrative description of the procedures to ensure that machines are filled to capacity and use coolest effective water temperature setting.

### On-Site Auditor Visit

The auditor will observe machines in use or staff that may be loading machines. The auditor may have conversations with staff to determine if staff is aware of the procedures for filling dishwashers, washing machines and dryers.

## 2.4 – HAZARDOUS SUBSTANCES

Substances are considered hazardous if they are ignitable, corrosive, toxic, or reactive. Hazardous substances can be found in common building operations and maintenance products like cleaning supplies, detergents, adhesives, paints, and pesticides, and have the potential to cause harm to humans, animals, or the environment, either by themselves or through interaction with other factors. Limiting the number of hazardous materials on-site reduces the threat of injury, risk to human health, and potential for spills or contamination of local waterways and sewer systems.

### 2.4.1 – MINIMIZATION OF HAZARDOUS SUBSTANCES

**Applies to**

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

**Intent**

To minimize the use of cleaning supplies, detergents, adhesives, paints, pesticides, etc. that are considered hazardous to protect the health of workers and guests.

**Standard Requirements**

The property shall seek to replace hazardous substances with less hazardous alternatives.

The property shall maintain records of the efforts it has made to replace the *hazardous* substances it uses with less *hazardous* alternatives.

An inventory shall be maintained of the *hazardous* materials stored on-site in order to avoid over-purchasing and unnecessary storage of *hazardous* materials.

**Implementation Options**

1. Identify hazardous substances, which meet one of the following definitions:
   A. classified as "hazardous" by an authoritative body (such as OSHA and DOT)
   B. have an NFPA health rating greater than 2
2. Create and maintain a list of hazardous substances. Include the chemical or product name, manufacturer and amount.
3. Review alternatives that are less *hazardous*, and consider shifting to specifying and purchasing products that are Green Seal Certified under the following categories:
   A. Cleaning Products certified under GS-37
   B. Laundry care products certified under GS-51
   C. Adhesives certified under GS-36
   D. Paints certified under GS-11
   E. Pesticides categorized as Minimum Risk under U.S. EPA regulations (note, EPA does not review and confirm whether products are classified as Minimum Risk).

4 In addition to shifting purchasing decisions, consider other strategies that may need to be enacted to successfully incorporate less hazardous substances on site:

A. Policy and procedure changes for housekeeping and maintenance staff
B. Training for product users
C. Waste stream segregation
D. Inventory control
E. Equipment modifications to accommodate different products
F. Product substitution specified in purchasing orders or specifications

5 Only purchase hazardous chemicals based on current inventory level and actual usage, referred to as a "Just In Time" purchasing policy. A "Just In Time" purchasing policy for chemicals and other hazardous materials is one way to ensure that the presence of on-site hazards is limited. A Just In Time approach moves materials directly from the receiving dock to the manufacturing area or business unit for immediate use. This limits the costs and risks associated with overstocking chemicals and other hazardous materials, which may otherwise become obsolete or outdated before they are used. Additionally, this policy is likely to result in cost savings from disposal of expired products.

It is important to consider which of your chemicals and products are an appropriate fit for a Just In Time Purchasing Policy. Those products that are used daily or are critical to the business operation may not be appropriate for inclusion in this policy.

Suppliers may be willing to accommodate a Just In Time policy, including less frequent regular deliveries, the ability to request a product shortly before an anticipated delivery, or helping the business to determine a set of substitute products in the event the usual products are not available at the time of ordering.

It is also important to tightly manage the purchasing with using a Just In Time approach, as lacking necessary products can result in lost productivity or individual employees purchasing unapproved products to complete a particular job. Inventory needs to be tightly monitored and considered alongside upcoming activities to ensure the necessary supplies are available as needed.

6 Maintain up to date records of the inventory and less hazardous replacements. Maintaining accurate inventory of hazardous substances not only helps an organization run more efficiently by knowing what materials it has on hand, but also keeps an organization from dedicating operating funds to excess inventory. Careful inventory of products also presents the potential to save money on testing to determine whether a product needs to be disposed of as (more expensive) hazardous waste. Inventorying also helps reduce waste management costs by ensuring products are used before their expiration date.

## Documentation Needed

Complete and upload Template 2.4.1, which requires the name of the hazardous substance, their use on the property, how much of the product is available on-site, whether it will be discontinued or replaced, what the replacement product will be, and if there is a replacement date.

## On-Site Auditor Visit

Auditor will check property storage areas to ensure that all *hazardous* materials are listed. Auditor may suggest hazardous substances be disposed of, when appropriate.

## 2.4.2 – STORAGE AND MIXING OF CLEANING AND POOL PRODUCTS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To minimize staff and guest exposure to hazardous substances used for cleaning, laundry, and pool maintenance.

**The Danger of Chlorine Exposure**

"When too much chlorine is added to pool water, a safe pool can become a pit of harmful chemicals. In fact, over-chlorinated pools threaten swimmers' health in two ways. First, contact with the skin can cause irritation similar to a burning sensation. Also, the gases given off by the evaporation of water oversaturated with chlorine-based cleaning solutions can enter the nose and eyes to cause severe itchiness and discomfort."

https://www.carewellurgentcare.com/2015/07/06/why-is-too-much-chlorine-in-pools-so-dangerous/

### Standard Requirements

All products intended for cleaning, laundry, and pool maintenance shall be stored in secure areas, and accessible only by staff.

Any on-site mixing or dilution of these products shall be conducted in an area with a water supply, drains plumbed for the appropriate disposal of liquid waste products, and adequate ventilation.

Backflow prevention devices are typically required where there is a potential for contamination of the drinking water supply.

### Implementation Options

Ensure chemical and mixing areas have:

- Adequate and secure product storage
- Accessible water for mixing concentrates
- Drains plumbed for disposal of liquid waste
- Access to adequate ventilation (e.g., fresh air, air filtration, or the mixing area door opens to an open area). The U.S. Occupational Safety and Health Administration provides guidance on ventilation standards, how to recognize ventilation hazards in the workplace, and ventilation control options.

If the chemical storage and mixing areas are not compliant, consider moving products to be stored and mixed to a compliant area, or determine what needs to be changed in the current storage and mixing area to meet the requirements and make the corrections.

### Documentation Needed

Complete and upload Template 2.4.2, which requires information on the location of chemical storage areas, identifying whether the space is secure, available access to water, whether drains are plumbed for the disposal of liquid waste, and whether there is access to adequate ventilation.

### On-Site Auditor Visit

The auditor will check the chemical storage and mixing areas to ensure the storage area is secure, has accessible water for mixing products, drains are adequately plumbed for liquid waste and that there is adequate ventilation. The auditor may have conversations with staff to ensure that the designated areas are used.

## 2.4.3 – CHEMICAL STORAGE

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To ensure that hazardous substances are stored and marked correctly and to minimize accidental spills or drips/leaks of hazardous chemicals.

### Standard Requirements

Products intended for cleaning, dishwashing, laundry, and pool maintenance shall be stored in clearly labeled containers. These containers shall be checked regularly for leaks, and replaced as necessary.

Spill containment devices shall be installed to collect spills, drips, or leaching of chemicals.

### Implementation Options

- Check that drums and storage containers for cleaning, dishwashing, laundry, and pool maintenance products are clearly labeled in languages spoken by personnel using materials.
- For drums or containers 5 gallons or larger, be sure spill containment devices are in place to collect spills, drips, or leaching of chemicals.
- Maintain a spill kit in areas where hazardous substances are stored. A spill kit is a set of materials used in the event of a chemical or hazardous material spill that allows for the quick, effective treatment of the hazard. A spill kit should include Personal Protective Equipment such as heavy-duty gloves made of nitrile or neoprene, chemical-resistant safety goggles, and a disposable lab coat or apron. For areas where larger spills could potentially occur, include a disposable protective suit and boot covers. Arrange the Spill Kit in such a way that allows for effective use in an emergency
- Alert and train staff on the procedures for checking containers for drips or leaching of chemicals. Procedures should be made available in all primary languages spoken by maintenance personnel.

### Documentation Needed

Complete and upload Template 2.4.3 Chemical Storage, which requires identifying the type of chemical products, whether containers are clearly labeled, how often the containers are checked for leaks, and to describe what spill containment measures are in place.

### On-Site Auditor Visit

Auditor will check that chemicals are clearly marked, spill containment devices are in place, and that there are no obvious spills/leaks/leaching. Auditor may also use judgment regarding containers smaller than 5 gallons that if they leaked or spilled would harm the environment (*e.g.*, go into drains).

## 2.4.4 – PEST CONTROL

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To encourage natural or organic insecticides, fertilizers, and biocides, or integrated pest management (IPM) techniques to reduce health risks and environmental impacts associated with conventional pesticides and fertilizer run off. Pesticides, herbicides, and rodenticides are commonly used to treat the presence of insects, weeds, and rodents on-site, but can contain heavy amounts of chemicals, accumulate in waterways, and persist in the environment. In addition to local water quality degradation, according to the EPA, pesticides—depending on the formulation—can affect human health including the nervous system, irritate the skin or eyes, may be carcinogens, and may affect the hormone or endocrine system in the body.[16]

### Standard Requirements

The property shall seek out and explore the use of Integrated Pest Management techniques, and insecticides, fertilizers, and biocides that are natural or Certified Organic.

Records shall be kept of the pest control techniques the property is using.

### Implementation Options

Look for a pest management service that uses Integrated Pest Management techniques or uses natural or Certified Organic chemicals.

If pest management is done in house, purchase the least harmful pesticides, herbicides, and rodenticides.

Keep records of pest control techniques used or reasons for not using at the property.

The U.S. Green Building Council has developed an Integrated Pest Management Plan Template that addresses pest control strategies (e.g., sanitation, exclusion, and traps), pesticide application notification, tenant communications, action thresholds and metrics for tracking pests, and quality control processes.

### Documentation Needed

Provide a narrative description of the pest control techniques the property is using. The description can be from the property, if this is conducted by in-house staff, or by contractor organization.

### On-Site Auditor Visit

Auditor will check for evidence of the program being utilized.

[16] *https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/human-health-issues-related-pesticides*

## 2.5 – PURCHASING

Purchasing is an important component of an organization's overall approach to sustainability. Purchasing is a regular, ongoing activity that results in a set of environmental impacts each time a purchase is made. Further, additional impacts may result when these consumables are used, and again when they are disposed of. Sustainable purchasing provides organizations the opportunity to save money, use their resources more strategically, and support best practices available today.

### 2.5.1 – ENVIRONMENTAL PURCHASING POLICY

**Applies to**

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

**Intent**

To promote the procurement of products with minimized impact on the environment and human health.

**Standard Requirements**

**Bronze Level**

The property shall establish an environmental purchasing policy, which specifies how the property will meet the following requirements. The policy shall address the following elements or their equivalent:

- The property has a steering committee, or "green team", which includes staff responsible for overseeing the writing and Suggested Implementation of the Purchasing Policy.
- Environmental preferences for products and services are incorporated into purchasing documents, and discussions with suppliers and vendors.
- Energy-efficient models of energy-consuming devices shall be specified and purchased (see Appendix 4).
- Preference is given to purchasing products in bulk and minimizing the purchase of single-use products.
- The environmental purchasing policy is available to the public upon request.

**Silver and Gold Level**

Meet the Bronze Level requirements, plus:

- The environmental purchasing policy is reviewed regularly, and modified if necessary, to ensure that it remains effective, feasible, and relevant.
- The property has an environmental mission.
- The property sets specific purchasing targets for environmentally preferable products and services.
- Energy-efficient windows are specified and purchased.
- Preference is given to service providers who are environmentally responsible.
- When purchasing products that typically emit VOCs, preference is given to products with lower VOCs.

**Implementation Options**

1 Establish a steering committee (or "green team"), comprised of one or more members, ideally someone from each department. The University of Pennsylvania developed a Green Team Guide that covers the process of establishing a green team, recruiting members, securing budget, and how to handle common challenges.

2 Determine which purchasing areas to prioritize within the Environmental Purchasing Policy. This can be done by conducting a spend analysis to find the products and the suppliers where the most dollars (and potentially, the greatest impact) reside within the property's spending.

In many cases, large spending in a purchasing area can translate to more environmental impacts resulting from that spending. In that sense, organizations can reduce their impacts significantly by focusing on addressing one (or a few) of these categories.

Within a particular product category, organizations are likely to find that they have a few suppliers with whom they spend the majority of their dollars. This situation can be leveraged to encourage suppliers to offer more environmentally preferable products and services, and to do so with little or no cost premium.

3 Develop an environmental purchasing policy. Refer to Template 2.5.1 Environmental Purchasing Policy for components required to be included.

The National Association of State Procurement Officials has created a Green Purchasing Guide that provides detailed guidance on shifting to environmentally preferable purchasing, identifying key stakeholders, creating policies, along with other state and federal resources.

Incorporate aspects of the policy that align with the requirements of this standard. For example, address each category (e.g., paints, hazardous substances, cleaning products, energy-efficient equipment, etc.) within the policy by citing the requirements the property intends to meet and the procurement requirements necessary to comply with requirements.

4 Determine how the policy will be communicated and implemented, including the duties and responsibilities of committee.

5 When reviewing the Environmental Purchasing Policy over time, discuss with procurement personnel what challenges they encounter finding products that meet specifications, whether product users have identified issues with product performance of efficacy, and if other product considerations should be made.

## Documentation Needed

Complete and upload Template 2.5.1.

## On-Site Auditor Visit

The auditor may have conversations with members of the steering committee or procurement staff to ensure purchasing goals have been properly communicated.

## 2.5.2 – PAPER PRODUCTS

**Applies to**

BRONZE LEVEL* | SILVER LEVEL* | GOLD LEVEL*

**Yes, implement either 2.5.2.1 or 2.5.2.2*

## 2.5.2.1 – PRINTING AND WRITING PAPER

**Applies to**

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

**Intent**

To reduce the amount of virgin material used in paper products and to encourage the use of *environmentally preferable* and *post-consumer materials* products.

**Standard Requirements**

The property shall purchase printing and writing paper that is either environmentally preferable, made from tree-free fiber, or meets the specifications outlined below.

- For letterhead, stationary, copy and printer paper, envelopes, invoices, business forms, etc.: a minimum of 30% post-consumer material content
- For coated paper: a minimum of 10% post-consumer material content

**Implementation Options**

- Audit current printing and writing paper use within the property. Collect purchasing data (e.g., purchase orders, receipts) for office paper products to determine consumption by the property. If the operation uses print management software, work with the IT Department to obtain a report out for several months of copy paper usage. If the operation does not have print management software, estimate this information in using purchasing data and through department engagement.
- Create a list of printing and writing paper (letterhead, stationary, copy paper, envelopes, invoices, etc.) purchased for the property. Determine whether or not each type of printing and writing paper meets one of the following environmentally preferable attributes:
  - are certified by Green Seal
  - contains at least 30% post-consumer recycled content (or 10% post-consumer recycled content for coated paper)
  - are made from tree free fiber
- If printing and writing paper do not meet these requirements, contact paper supplier/vendor for replacement products.
- Ensure environmentally preferable purchasing requirements for printing and writing paper are incorporated into the property's Environmental Purchasing Policy, and that requirements are incorporated into specifications within Requests for Proposals (RFPs) and Purchase Orders.
- Records should be kept of new purchases and all printing and writing paper purchased for the property.

"Recycled content" or "recovered material content" typically includes both pre-consumer and post-consumer paper. If existing information or information provided by the supplier addresses only "recycled content" or "recovered material content", the property must inquire specifically about post-consumer content. Documentation of only the "recycled content" or "recovered material content" is not considered sufficient.

### Documentation Needed

Recent purchase order or invoice of printing and writing paper purchases.

Complete and upload Template 2.5.2 Paper Products
*(Note: Bronze projects need only complete either printing and writing paper section or sanitary paper products section.)*

### On-Site Auditor Visit

The auditor may spot check to ensure compliant products are being used on the property.

### 2.5.2.2 – SANITARY PAPER PRODUCTS

**Applies to**

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

**Intent**

To reduce the amount of virgin material used in paper products and to encourage the use of *environmentally preferable* and *post-consumer materials* products.

**Standard Requirements**

The property shall purchase sanitary paper products that are either environmentally preferable or meet the specifications outlined below:

- Napkins and paper towels: minimum 40% post-consumer material content
- Toilet tissue: minimum 20% post-consumer material content
- Facial tissue: minimum 10% post-consumer material content

**Implementation Options**

- Create a list of the sanitary paper products (napkins and paper towels, toilet tissue and facial tissue) purchased for the property.
- Determine whether or not each type of printing and writing paper meets one of the following environmentally preferable attributes:
  - are certified by Green Seal
  - meet the following requirements for post-consumer material:
    - Napkins and paper towels: minimum 40% post-consumer material content
    - Toilet tissue: minimum 20% post-consumer material content
    - Facial tissue: minimum 10% post-consumer material content
- If sanitary paper products do not meet these requirements, hotel should contact supplier/vendor for replacement products.
- Ensure environmentally preferable purchasing requirements for sanitary paper are incorporated into the property's Environmental Purchasing Policy, and that requirements are incorporated into specifications within Requests for Proposals (RFPs) and Purchase Orders.
- Records should be kept of new purchases and all sanitary paper products purchased for the property.

"Recycled content" or "recovered material content" typically includes both pre-consumer and post-consumer paper. If existing information or information provided by the supplier addresses only "recycled content" or "recovered material content", the property must inquire specifically about post-consumer content. Documentation of only the "recycled content" or "recovered material content" is not considered sufficient.

## Documentation Needed

Recent purchase order or invoice of printing and writing paper purchases.

Complete and upload Template 2.5.2 Paper Products
*(Note: Bronze projects need only complete either printing and writing paper section or sanitary paper products section.)*

## On-Site Auditor Visit

The auditor may spot check to ensure compliant products are being used on the property.

## 2.5.3 – CLEANING, LAUNDRY, AND DISH PRODUCTS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce the environmental and human health impacts of cleaning, laundry and dish products. For example nitrilotriacetic acid (NTA), can be found in laundry detergent and is a suspected carcinogen; contact with chlorine bleach can severely irritate and burn the eyes and skin and may cause asthma. Additionally mixing chlorine bleach with some other cleaning chemical can generate toxic fumes.

### Standard Requirements

#### Bronze Level

**2.5.3.1** – Laundry detergents and cleaning products intended for general purpose, glass, floor, restroom, carpet extraction and carpet pre-spray cleaning shall be concentrated and either:

- environmentally preferable

***OR:***

- non-phosphate, nontoxic, and biodegradable

#### Silver and Gold Level

Meet the Bronze Level requirements, plus:

**2.5.3.2** – The property shall demonstrate that cleaning products and laundry and dish detergents that contain chlorine bleach are used only where less toxic alternatives are not available, and then only in minimal amounts.

**2.5.3.3** – The property shall use automatic dishwashing detergents that are either *environmentally preferable* ***OR:***
*biodegradable,* do not contain nitrilotriacetic acid, and are not formulated with chlorine bleach.

**2.5.3.4** – General purpose cleaning products shall contain less than 10% *VOCs* by weight.

If disinfecting restroom cleaners are used, they may be exempted from the biodegradable requirement if the property can demonstrate that there is no practicable biodegradable alternative.

### Implementation Options

#### Bronze Level

Identify the cleaning products listed below that are currently being used at the property. With the exception of the laundry detergent, these would generally be the products on the housekeeping cart.

- Carpet cleaners (extraction and pre-spray)
- Floor cleaners
- General-purpose cleaners
- Glass cleaners
- Restroom cleaners

- Laundry detergent (not including rinses, brighteners, sours, etc.)
- Exclude specialty products such as polishes, gum remover, mold and mildew cleaners, sours and brighteners, etc.

Consult the product labels,Safety Data Sheets (SDS) and/or contact your supplier to determine whether or not the cleaning products meet all of the following requirements:

- Is environmentally preferable (i.e., Green Seal certified) ***OR***
- Does not contain phosphates
- Is considered non-toxic
- Is biodegradable
- Is *concentrated* (at least 1:16 dilution ratio with water – for liquids; 1:32 is recommended for general purpose cleaners)

If any cleaning product does not meet the above requirements, switch to an acceptable alternative product that does meet the above requirements. Maintain records of new chemical purchases and all cleaning chemicals purchased by the property.

### Silver and Gold Levels

Meet the requirements and provide documentation for Section 2.5.3.1. In addition, identify the automatic dishwashing detergent (not including sanitizers, rinses, etc. that are currently being used at the property.) Determine which cleaning products, laundry and dish detergents contain chlorine bleach and if they do, by looking at the supplier website, product label, SDS or in consultation with the manufacturer representative, determine if there are less toxic alternatives available and switch to those. Under 2.5.3.2, dish detergents include any liquid or soap used to wash dishes (excluding automatic dishwashing detergent). If none are available, these products should be used in minimal amounts.

For general purpose cleaning products, the SDS or product data/documentation should tell you whether the product contains less than 10% *VOCs* by weight. If the product does not meet this requirement it should be discontinued and/or replaced.

Discontinue use of automatic dishwashing detergents that contain nitrilotriacetic acid (NTA), and chlorine bleach.

## Documentation Needed

Recent purchase orders and/or invoices of laundry and cleaning products. Silver and Gold Level properties must also provide recent purchase orders and/or invoices for automatic dishwasher detergent.

Complete and upload Template 2.5.3, which requires each product name and manufacturer, links to the product pages, and confirming whether the products are environmentally preferable (i.e., certified by Green Seal, Ecologo, or SaferChoice recognized). Bronze level properties do not need to meet requirements for automatic dish detergent.

## On-Site Auditor Visit

The auditor will check to see what cleaning products and laundry and automatic dish detergents are being used and verify if they are compliant by checking available MSDS and other documentation.

## 2.5.4 – PAINTS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To ensure that paint used on the property is free from hazardous chemicals and to minimize the amount of *Volatile Organic Compounds* emissions in the property. Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids. According to the U.S. EPA, concentrations of many VOCs are up to ten times higher indoors than outdoors. Health effects from VOC exposure may include:

- Eye, nose and throat irritation
- Headaches, loss of coordination and nausea
- Damage to liver, kidney and central nervous system
- Some organics can cause cancer in animals, some are suspected or known to cause cancer in humans.

### Standard Requirements

**2.5.4.1** – The property shall purchase *architectural paints* that are either *environmentally preferable* or meet the following requirements:

The VOC content of the paints shall not exceed the following limits:

- Interior Flat: 50 g/l
- Interior Non-Flat: 150 g/l
- Exterior Flat: 100 g/l
- Exterior Non-Flat: 200 g/l
- Anti-Corrosive All Finishes: 250 g/l

The paints shall not contain any of the following heavy metals or toxic organic substances:

- antimony
- cadmium
- hexavalent chromium
- lead
- mercury
- acrolein
- acrylonitrile
- benzene
- 1,2-dichlorobenzene
- ethylbenzene
- formaldehyde
- isophorone
- methylene chloride
- methyl ethyl ketone
- methyl isobutyl ketone
- naphthalene
- phthalate esters
- toluene (methylbenzene)
- 1,1,1-trichloroethane
- vinyl chloride

**2.5.4.2** – The property shall maintain an inventory for all *architectural paints*, including product name, manufacturer, and sheen (e.g., flat, eggshell, etc.)

**2.5.4.3** – Non-compliant paints shall be removed from the property. If a paint recycling program is not available, appropriate disposal procedures shall be followed.

Exceptions may be made for limited-use *architectural paints* used in high-wear or historic areas if compliant options are not available.

## Implementation Options

Create a list of all  paints on property. By looking on the manufacturer's website, the paint's label or the SDS, determine if the paint is *environmentally-preferable* (i.e., certified by Green Seal). Paints certified by Green Seal meets the requirements of Section 2.5.4.1.

For paints that do not hold an environmentally-preferable certification, determine the type of paint (flat or semi-gloss; exterior or interior). Then, determine if  the VOC content meets the standard's requirements. Does the paint contain any of the prohibited ingredients.

For paints that do not meet the requirements, create and implement a plan for how to properly dispose of these paints. To prepare unwanted coatings products for safe disposal, ensure lids are secured tightly, containers are not leaking, and all coatings are in their original containers with their original label. Do not inter-mix paints prior to disposal. Maintain a sufficient supply of paint and finishes for future touch up and maintenance as needed. The American Coatings Association administers the PaintCare program, which makes it easy to recycle leftover and unwanted paint.

Maintain records of new purchases of paint and all paint kept on the property, including the amounts of each paint.

Ensure workers are trained to safely use and apply products, use personal protective equipment as appropriate, provide adequate ventilation during application, rely on professional applicators when necessary, and use appropriate cleaning agents.

Exceptions to these requirements may be made for limited-use architectural paints used in historic areas or high traffic areas.

## Documentation Needed

If paint has recently been purchased, submit a purchase order or invoice and SDS or other documentation to confirm it meets the requirements of the standard.

Provide evidence that non-compliant paint has been removed from property.

Complete and upload Template 2.5.4 Paints, which requires the brand/product name of recently purchased paints, the paint manufacturer, the amount of paint available in inventory on site, the sheen, and link to product page.

## On-Site Auditor Visit

Auditor will check the inventory of paint and will observe the paint cans stored on the facility to ensure that all products are listed on the inventory. Auditor will also review that all products meet the requirements of the criteria based on certification, data/documentation from manufacturer or supplier or other product information about the prohibited chemicals.

## 2.5.5 – DURABLE GOODS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To encourage the use of durable products and extend the useful life of products used on-site. According to the U.S. EPA, furniture and furnishings in municipal solid waste was 12.2 million tons in 2017 (4.6 percent of total MSW), up from 2.2 million tons in 1960. A significant proportion (19.5 percent) of furniture and furnishings was combusted for energy recovery in 2017, but the majority of this product sector was landfilled (80.2 percent).[17]

### Standard Requirements

Appliances and furniture purchased by the property shall be of sufficient quality to last for several years and allow reuse, refinishing and/or reupholstering.

### Implementation Options

When considering new appliances and furniture for purchase, determine if the items to be purchased will last for several years and can be reused, refinished or reupholstered. An example of reuse may include selling furniture and equipment to another property or furniture liquidator.

Recycling Works Massachusetts has created Business and Institutional Furniture and Office Equipment Reuse Guidance, which provides an overview of the benefits of reuse, how to develop a reuse plan, potential reuse outlets, and end-of-life recycling and disposal considerations, including regional mattress recycling options.

IRN, The Reuse Network, connects those in need with those who have surplus. They match the needs of charities and nonprofits throughout the world with surplus furnishings and equipment from schools, universities, corporations and other large organizations. IRN makes the match and manages the labor and logistics to move, load, and ship surplus to those in need.

### Documentation Needed

Complete and upload Template 2.5.5 Durable Goods, which requires the list of durable goods on the property and a determination of whether the durable good can be reused, refinished, or upholstered.

### On-Site Auditor Visit

The auditor will spot check newly-purchased furniture on-site to check if it may be reused rather than replaced. The auditor may have conversations with staff to inquire whether or not the furniture and appliances are being reused, refinished or reupholstered.

[17] *https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/durable-goods-product-specific-data#FurnitureandFurnishings*

## 2.5.6 – REUSABLE PACKAGING AND SHIPPING PALLETS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To ensure the product suppliers cut down on the amount of waste generated due to packaging and shipping pallets. Pallets are estimated to account for over 90 percent of total wood packaging. According to the U.S. EPA, in 2017, the generation of wood in MSW was 18 million tons. This equaled 6.7 percent of total MSW generation that year.[18]

### Standard Requirements

Preference shall be given to product suppliers who provide and take back reusable packaging and shipping pallets. Packaging that is not reusable shall be minimal and recyclable.

### Implementation Options

- Determine if the hotel's suppliers currently take back, or have the capability to take back, reusable packaging (such as corrugated boxes) and whether they offer returnable shipping pallets.
- If current suppliers do not offer take-back, communicate with the supplier or vendor that the preference is for suppliers to take back packaging and offer returnable shipping pallets. Consider switching to alternative suppliers and vendors who offer this service.
- Packaging that is not reusable should be minimal and recycled where possible.

### Documentation Needed

Complete and upload Template 2.5.6 Reusable Packaging and Shipping Pallets, which requires the list of preferred vendors and suppliers, whether they take back packaging and shipping pallets, and designate whether non-reusable packaging minimal and recyclable.

### On-Site Auditor Visit

The auditor will observe the packaging and shipping pallets present at the property to ensure it is in accordance with the documented procedure.

[18] *https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/wood-material-specific-data*

## 2.5.7 – ENVIRONMENTALLY RESPONSIBLE SUPPLIERS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To ensure preference is given to environmentally responsible service suppliers used by the property.

### Standard Requirements

The property shall give preference to environmentally responsible service providers (2.5.1). A list of these services shall be available to guests or included in the environmental purchasing policy.

### Implementation Options

- Work with members of the green team to determine how the property designates an environmentally responsible service supplier. A variety of criteria could be considered for this, including (but not limited to) the following:
  - Service providers who are Certified B Corps.
  - Suppliers recommended by the Sustainable Purchasing Leadership Council's Supplier Rating Tool.
  - Suppliers and service providers who meet relevant environmental criteria outlined within this standard (e.g., cleaning service providers that are certified under GS-42).
  - Service providers who meet other environmental or social responsibility criteria determined by the property.
- Determine which of the hotel's service providers are environmentally responsible.
- Create a list of environmentally responsible service suppliers offered and used by the hotel.
- Make that list available to guests and/or include in environmental purchasing policy.

### Documentation Needed

Complete and upload Template 2.5.7, which requires the list of all environmentally responsible service providers, and a description of the service they offer.

### On-Site Auditor Visit

Auditor will observe signage or information regarding environmentally responsible services available to guests.

## 2.6 – CONTINUAL IMPROVEMENT

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To establish continuous improvement at the property for environmental performance.

### Standard Requirements

The property shall have a substantive plan for achieving meaningful continual improvement in its environmental performance. The plan shall include goals with short-and long-term benchmarks and use quantifiable metrics wherever possible.

### Implementation Options

Determine which areas of environmental performance the property wants to improve upon. The property should establish an action plan that outlines short-term and long-term goals. These should include specific metrics and benchmarks for measuring improvement in environmental performance, for example, reduce waste generation by 10% during the next year.

### Documentation Needed

Plans that outline the short-term and long-term goals for the property, including metrics (or how achievement will be measured) and resultant action.

### On-Site Auditor Visit

The auditor may review the policies and procedures of the property for continuous environmental improvement.

## 2.7 – ADDITIONAL REQUIREMENTS FOR GOLD LEVEL

The property shall meet three of the following requirements (2.7.1 – 2.7.8):

### 2.7.1 – ENERGY REDUCTION

**Applies to**

BRONZE LEVEL ✗ | SILVER LEVEL ✗ | GOLD LEVEL ✓

**Intent**

To ensure energy-efficiency at the property level.

**Standard Requirements**

The property shall set substantive, meaningful goals for energy reduction.
***OR***
The property shall be an ENERGY STAR Leader, or equivalent.

**Implementation Options**

Establish a policy and procedures that outline the energy reduction goals, including specific measurements and monitoring of energy use over time, e.g., utility bills or specific metering. Consider convening a workshop with the green team to determine energy reduction goals. If you do not have the internal experience and knowledge for administering this type of workshop, consult a design charrette professional to help facilitate.

Use a whole building analysis to identify the short-, medium, and long-term ways to drive down energy use over time. Some of these strategies will involve investment in base building system upgrade and replacement, while others will include engaging other building tenants (e.g., restaurants, cafes, print centers within the building, etc.) in more energy efficient operation within their individual spaces.

Consider using EPA's ENERGY STAR Portfolio Manager to track building performance. Using the ENERGY STAR Portfolio Manager will help property managers to understand the ways in which their building uses energy, and where to prioritize renovations or system upgrades to both save money and improve energy efficiency.

Additionally, once performance data has been tracked, consider whether the building should undergo ENERGY STAR certification, which would demonstrate how the building is performing on energy efficiency related to other comparable buildings. This provides an easy way for property owners to communicate progress and high performance when it comes to energy efficiency improvements, and makes the property more attractive to tenants similarly seeking to operate more sustainably.

**Documentation Needed**

- Policy and procedures that state the overall energy reduction goals as well as how energy will be monitored over time and how specific measurements will be assessed.
- Records that document the progress towards the goals.
- Policies should also outline results of achieving goals and results if the goals are not met.
- Alternatively, the property can provide evidence of participation in the ENERGY STAR Leader program or an equivalent program.

### On-Site Auditor Visit

The auditor may review the policies and procedures of the property for energy reduction goals.

## 2.7.2 – MANAGEMENT OF RESOURCE USE. ENERGY, WATER AND WASTE

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To help the property develop an understanding of its resource use and to provide a baseline of its use and costs. Tracking resource use will provide documentation to determine the effectiveness of the property's practices for continuous improvement and determine whether the goals are being met.

### Standard Requirements

**2.7.2.1** – The property shall track its energy consumption (electricity, natural gas, fuel, etc.), potable water consumption, and the amounts of waste collected for disposal/incineration and for recycling.

**2.7.2.2** – Monthly bills shall be tracked with the ENERGY STAR Portfolio Manager, or an equivalent resource management or documentation system (e.g., utility software or Excel spreadsheet) that:

1. tracks costs, total consumption, and Resource Use Intensity
2. benchmarks these factors relative to past performance (normalized for sales volume)
3. determines percent improvement or savings in energy, water, and generation of waste.

**2.7.2.3** – These impacts shall be reviewed at least annually, with appropriate goals set for continuous improvement.

### Implementation Options

Select a tracking system most useful for your property to track energy consumption, costs, resource use intensity (e.g., Energy Use Intensity in BTU/sq. ft., Gallons/sq. ft., or tons of waste/sq. ft.), benchmark performance, and determine improvements and savings. Consider using ENERGY STAR Portfolio Manager which allows users to track energy, water, and waste data within one platform.

The further back you are able to track the hotel's energy and potable water consumption and waste collection, the more useful this information will be to help set goals for continuous improvement and benchmarking the following year.

When setting goals for continuous, meaningful improvement, consider what the property would like to accomplish as a whole, where would cost savings or energy reduction make the most impact. The American Council for an Energy Efficient Economy developed a resource for how to set meaningful energy management goals, which can also be used to consider water and waste goals.

In addition, consider using the following tools to assist with energy planning and goal setting:

- The 3% Solution
- Green-e® Marketplace for Business and Products
- Green Gigawatt Partnership
- Green Power Partnership
- RE100
- Science Based Targets

Consider Energy Service Performance Contracts (ESPCs) for making facility improvements with no up front capital cost. The U.S. Department of Energy provides model documents for an ESPC project, and the Energy Services Coalition website provides a case study database, Video intro to ESPC, 5 steps to success, RFP for Pre-qualifying ESCOs, and a Model RFP for Facility Owners.

### Documentation Needed

- Evidence of a minimum of three months of tracking energy and potable water consumption and waste collected for disposal/incineration and recycling, including costs, total consumption, and Resource Use Intensity (12 months of tracking will be required for compliance monitoring).
- Description of continuous improvement goals based on a comparison to previous tracking data.
- Records, meeting minutes or other evidence that the impacts from resource tracking have been reviewed at least annually.

### On-Site Auditor Visit

The auditor may review the policies and procedures of the property for resource use reduction goals.

## 2.7.3 – SUSTAINABLE BUILDING

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To promote sustainable building practices and operations.

### Standard Requirements

The property shall be certified by a nationally-recognized green building certification program.
***OR***
The property shall register for and actively be in the process of achieving a nationally-recognized green building certification program.

### Implementation Options

The property should seek to achieve U.S. Green Building Council's LEED certification, ENERGY STAR Certification for Buildings, Green Globes Certification, or another nationally-recognized green building certification.

Learn more at:

- www.usgbc.org
- www.energystar.gov
- www.greenglobes.com

### Documentation Needed

Documentation that property is certified to a nationally-recognized green building program or that the property is in the process of achieving certification.

### On-Site Auditor Visit

The auditor may review official documentation for property's certification or application process.

## 2.7.4 – RENEWABLE ENERGY

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To promote the use of *renewable energy* and decrease reliance on fossil fuels. Fossil fuel based electricity use is the largest contributor to greenhouse gas emissions in the United States. In addition, air quality degradation results from coal, natural gas, and petroleum combustion.

### Standard Requirements

The property uses renewable energy for at least 25% of its needs, either via onsite production or certified *Renewable Energy Certificates*.

Alternatively, the property has been certified through the Center for Resource Solutions' Green-e Marketplace program or is a Partner in the EPA's Green Power Leadership Club.

### Implementation Options

The property should determine their capability to produce renewable energy onsite and the offerings of certified renewable energy certificates. This will likely require engaging with the following stakeholders:

- Facilities team representative (on-site activities only)
- Energy managers
- Finance representative
- Legal representative
- Accounting representative
- Executive decision-maker

The combination of installed, onsite generation and RECs should total at least 25% of the total energy use of the property. Learn more about purchasing Green-e Certified RECs here.

Alternatively, the property can seek certification through the Center of Resource Solutions' Green-e Marketplace or become a Partner in the EPA's Green Power Leadership Club.

### Documentation Needed

Documentation showing that at least 25% of the energy used by the property is from renewable energy, either generated on-site or purchased from certified renewable energy certificates.

### On-Site Auditor Visit

The auditor may review documentation of renewable energy, including information about renewable energy sources locally and if applicable, membership and purchase information for the Center for Resource Solutions Green-e Marketplace or EPA's Green Power Leadership Club.

## 2.7.5 – GREENHOUSE GAS EMISSIONS

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce the property's contribution of *greenhouse gas* emissions, which is the main cause of global climate change.

### Standard Requirements

The property shall offset *greenhouse gases* through partnerships or certified carbon offsets to compensate for all Scope 1 and Scope 2 *greenhouse gases* emitted within the property, following the UNFCCC reporting guidelines, ***AND*** shall maintain an active program to reduce its *greenhouse gas* emissions.

*Note: The Greenhouse Gas Protocol defines methods for calculation of greenhouse gas emissions: Scope 1 includes all direct emissions from sources that are owned or controlled by the property. Scope 2 includes all indirect emissions that are a consequence of the activities of the property, but occur at sources owned or controlled by another entity, such as the consumption of purchased electricity, heat, or steam.*

### Implementation Options

- Calculate Scope 1 and Scope 2 greenhouse gas emissions.
  - More information on the UNFCCC reporting guidelines for Scope can be found here.
  - For Scope 1 Emissions, consider using the EPA's Simplified Greenhouse Gas Emissions Calculator, Version 3.2.
  - For Scope 2 Emissions, consult the World Resources Institute's GHG Protocol Scope 2 Guidance.
- Offset calculated greenhouse gases through partnership or certified carbon offsets.
  - Partnerships may include engaging in programs such as the Carbon Fund Carbon Free Partner.
  - Certified Carbon Offsets can be purchased here.

### Documentation Needed

Documentation of the *greenhouse gas* emissions of the property, and measurable ways to reduce the emissions of the facility.

Documentation of *greenhouse gas* reduction through partnerships or carbon offsets.

### On-Site Auditor Visit

The auditor may review documentation and observe partnerships that receive the greenhouse gas emissions and will review carbon offset documentation. The auditor may also check documentation for the program for reducing the greenhouse gas emissions.

## 2.7.6 – WASTE REDUCTION

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To reduce waste generated by the property and costs associated with hauling and disposal.

### Standard Requirements

The property shall reuse, recycle, or compost 60% of its solid waste, thus diverting it from landfills and incinerators.

### Implementation Options

Conduct an initial waste assessment to identify the quantity and composition of materials in your waste stream. The U.S. EPA provides guidance on best practices for conducting a waste assessment, set waste reduction goals, and improve waste management practices.

For food waste and yard waste composting, use the U.S. EPA's Tools for Assessing Wasted Food and Guide to Conducting and Analyzing a Food Waste Assessment to serve as a guide for this exercise. Determine what composting facilities and options are available in your area, and which materials they collect for composting. The U.S. EPA maintains a list of food waste diversion options by region.

For recycling, use the StopWaste Guidelines for Recycling, Organics, and Refuse Services to assist with planning collection locations, considerations for exterior enclosures, and unique considerations for successfully implementing a recycling program in taller buildings.

In addition, consider using the waste tracking functionality in the ENERGY STAR Portfolio Manager along with their communications toolkit to let colleagues, stakeholders, and customers know about your waste reduction efforts.

### Documentation Needed

Documentation of policy and procedures of the specific type of waste generated by the property and the end result of how those materials are reduced, reused, recycled or composted, accounting for all waste generated at the property.

The property must also submit metrics or calculations to verify that 60% of solid waste is diverted from landfills and incinerators.

### On-Site Auditor Visit

The auditor will review policies and procedures that outline how to deal with waste and will observe on-site the generation and reduction of waste at the property. The auditor will also observe and review the reduction, reuse, recycling and composting activities on-site.

## 2.7.7 – GREEN CLEANING

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To encourage the use of green cleaning services. Certified green cleaning services provide the following benefits:

- Improved occupant health from reduced exposure to dust and toxic chemicals
- Decreased incidences of asthma attacks
- Significantly safer indoor air
- Notable reductions in waste generation
- A higher quality service process through careful implementation

### Standard Requirements

The cleaning services on the property shall meet the requirements in the Green Seal Environmental Standard for Cleaning Services (GS-42), or are certified to that standard.

### Implementation Options

Seek out the use of a Green Seal GS-42 Certified cleaning service provider using the certified provider portal.

Alternatively, the property may either:

- adopt the policies, procedures, and use of environmentally preferable cleaning products within the GS-42 standard ***OR***
- certify its in-house cleaning services to Green Seal's GS-42 standard, available here.

### Documentation Needed

Evidence of GS-42 certification (certificate or letter from Green Seal) ***OR***

Policies and procedures of the property's green cleaning service/program, including equipment used, training of staff and use of *environmentally preferable* cleaning products.

Comprehensive documentation of policy and procedures of the cleaning service is required if the cleaning service is not GS-42 certified.

### On-Site Auditor Visit

The auditor may review policies and procedures that demonstrate the cleaning service meets the requirements of GS-42 or GS-42 certification documentation and will observe on-site that the property is being cleaned accordingly.

## 2.7.8 – WATER CONSERVATION

### Applies to

BRONZE LEVEL | SILVER LEVEL | GOLD LEVEL

### Intent

To encourage water conservation for the property and reduce operating costs.

### Standard Requirements

The property shall meter and monitor its water consumption.
***AND***
All of the toilets, bathroom faucets, shower heads, and landscape irrigation shall meet the EPA WaterSense® requirements.

### Implementation Options

Explore water metering and submetering options. The Alliance for Water Efficiency provides resources for advanced metering infrastructure, irrigation meters, smart meters, and submeters, available here.

Water use tracking and monitoring can be done in ENERGY STAR Portfolio Manager along with their communications toolkit to let colleagues, stakeholders, and customers know about your waste reduction efforts.

Consider joining the U.S. EPA WaterSense H2Otel Challenge to help hotels understand their water use impact, and savings opportunities, find the right WaterSense and water efficient products for their property, and track water savings progress over time.

For more information on WaterSense® products, visit: www.epa.gov/WaterSense/.

### Documentation Needed

A list of water fixtures and documentation that they meet the requirements of the EPA WaterSense program (by WaterSense labeling, or manufacturer specifications.)

Evidence and documentation of metering and monitoring of water consumption.

### On-Site Auditor Visit

The auditor will review the water fixtures, meters and monitoring of water consumption.

# 3.0 – Certification and Labeling Requirement

Unless otherwise approved in writing by Green Seal, the following labeling requirements shall apply to all levels of certification.

## 3.1 – CERTIFICATION MARK

The Green Seal® Certification Mark may appear on the certified property and promotional materials, only in conjunction with the certified service, and shall include the level of certification. Use of the Mark must be in accordance with *Rules Governing the Use of the Green Seal Certification Mark*.

The Green Seal Certification Mark shall not be used in conjunction with any modifying terms, phrases, or graphic images that might mislead consumers as to the extent or nature of the certification.

Green Seal must review all uses of the Certification Mark prior to printing or publishing.

## 3.2 – USE WITH OTHER CLAIMS

The Green Seal Certification Mark shall not appear in conjunction with any human health or environmental claims unless verified and approved in writing by Green Seal.

## 3.3 – STATEMENT OF BASIS FOR CERTIFICATION

Wherever the Green Seal Certification Mark appears, it shall be accompanied by a description of the basis for certification. The description shall be in a location, style, and typeface that are easily readable. If online space is limited, a link to the basis of certification may be used.

The description shall read as follows, unless an alternate version is approved in writing by Green Seal:

> [NAME OF PROPERTY] meets Green Seal™ Standard GS-33 based on waste minimization, water and energy efficiency, hazardous substance handling, and an environmental purchasing policy.
>
> [www.GreenSeal.org]

**Documentation Needed**

Copies or photos of any promotional material (brochures, fliers, website links, table tents, etc.), where the Green Seal Certification Mark is used and/or where human health or environmental claims are listed. Also copies of letterhead or business cards where the Green Seal Certification Mark is used and/or where human health or environmental claims are listed. Policy or signed attestation on letterhead that the Green Seal Mark will be used in accordance with Rules Governing the Use of the Green Seal Certification Mark.

**On-Site Auditor Visit**

Auditor should look for uses of the Mark and mentions of Green Seal on the property.

# GS-33 Annex A – Definitions* (Normative)

**Architectural Paint:** Wall paints, anti-corrosive and reflective coatings, floor paints, primers, and undercoats.

**Biodegradable:** Breaks down readily in the environment. For conformance to this standard, the product shall be labeled or declared by the manufacturer to be "biodegradable," "readily biodegradable," or an equivalent term. Alternatively, it shall be proven to meet a definition of "ready biodegradability" set by an authoritative body (e.g. the OECD) (e.g., as specified in section 3.13 (Aquatic Biodegradability) in GS-37.

**Carbon Offsets:** Mitigation of greenhouse gas emissions generated at the property using reduction measures certified by or purchased from a third-party provider.

**Concentrated:** Products that are substantially diluted with water to form the solution used for cleaning. The dilution factor required for conformance to this standard shall be appropriate for the type of product commonly purchased by the property and for the intended use.

**Cost-Effective:** Producing positive results in proportion to the expenditure of resources (e.g., time, money, materials, etc.) and having a return on investment period less than or equal to three years.

**Energy-Efficient:** Requiring the consumption of a minimum amount of energy to provide a maximum amount of work or functionality. In the United States, products shall be identified as being in the lowest quarter (1/4) of energy used according to the FTC's yellow EnergyGuide labels, verified as environmentally-preferable, or otherwise demonstrate that they consume significantly less energy when compared with similar equipment using established, industry-standard testing methods.

**Environmental Mission:** A statement of sustainability goals for a specific property, created as a guide for the property in making decisions and choosing the actions needed to reach these goals.

**Environmentally-Preferable:** A product or service certified as such by a Type 1 (i.e., third-party) environmental label that was developed in accordance with the ISO 14024 Environmental Labeling Standard. Alternatively, a product or service designated as environmentally preferable by an established and legitimate nationally-recognized third-party program developed with the purpose of identifying environmentally preferable products. The program must not have any financial interest or stake in sales of the product or service, or other conflict of interest. The standard must be appropriate, meaningful, and based on the product's life cycle with consideration of human health and safety, ecological toxicity, other environmental impacts, and resource conservation. Criteria must be publically available, developed with stakeholder input, and distinguish market leadership for that product category. Certification must be completed by a third party, include site inspections, and have a monitoring program to verify ongoing compliance.

**Greenhouse Gas:** Components of the atmosphere that increase the heat trapped by the Earth's atmosphere ("the greenhouse effect"): carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF6), carbon monoxide (CO), nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), and sulphur oxides (SOx).

**Hazardous:** For conformance to this standard, substances are considered hazardous if they are classified as "hazardous" by an authoritative body (such as OSHA or DOT), have a NFPA health rating greater than 2, are labeled with signal words such as "Danger," "Caution," "Warning," or are flammable, corrosive, or ignitable.

**Note that the defined terms are italicized throughout the standard and guidebook.*

**Non-Phosphate:** Containing no more than 0.5% by weight of phosphates or phosphate derivatives.

**Nontoxic:** The product does not exhibit potentially harmful characteristics, as defined by the Consumer Product Safety Commission regulations (16 Code of Federal Regulations (CFR) Chapter II, Subchapter C, Part 1500), and is not required to be labeled as Toxic or Highly Toxic.

**Renewable Energy:** Forms of energy from renewable sources, including energy from wind, solar, water, geothermal, and biofuels.

**Renewable Energy Certificates:** Units of renewable energy purchased from a third-party provider that are sold only once or claimed only by a single party.

**Postconsumer Material:** A material or product that has served its intended end use and has been recovered or diverted from the waste stream in order to be recycled.

**Volatile Organic Compounds (VOC):** Compounds listed by the United States Environmental Protection Agency (EPA) in 40 CFR Section 51.100(s), (s)(1).

# GS-33 Appendix 2 – List Of Best Practices (Informative)

The following is a list of suggested "Best Practices" that properties can implement in order to further their environmental leadership. Best Practices can positively influence the guests' experiences while reducing the environmental footprint and increasing operational productivity. Many of the Best Practices are supplementary to the GS-33 criteria and their Suggested Implementation can help a property conform to GS-33.

**(2.1.1) Recycling**
The property has separate tracking for each type of recycled material. The property implements a recycling program in which the recyclable materials are collected separately from trash.

**(2.1.4) Food Donation**
The property donates leftover food to a local shelter or food bank where programs are available and where permitted by local regulatory agencies.

**(2.1.5) Food Service Items**
The property's food service items are reusable, to the full extent practicable. Disposable food service items are 100% compostable or biodegradable (only if they are collected for composting) or 100% recyclable.

**(2.2.1) Energy Equipment and Energy-Efficient Replacements**
The property maintains and regularly updates an inventory of energy-consuming devices that includes the date of purchase, estimated date of replacement, and energy-efficiency status for each item.

**(2.2.4) Windows**
Existing windows have window films or window treatments, (e.g., curtains, blinds, awnings, etc.) where climate and orientation indicate that significant energy savings will result.

**(2.2.5) Climate and Lighting Control**
The property uses programmable on/off timers and/or sensors used for lighting and HVAC control in low traffic and low occupancy areas.

**(2.3.1) Water Efficient Fixtures**
The property installs water efficient fixtures, such as dual-flush toilets, high efficiency toilets (WaterSense® label), low-flow aerators, waterless urinals, and composting toilets.

Automated faucets are calibrated and maintained in order to ensure that water is triggered only when needed for use. Kitchen sinks on the property have a flow rate no greater than 2.2 gpm. Pre-rinse spray valves have a flow rate no greater than 1.6 gpm.

**(2.3.2) Landscaping and Irrigation**
All exterior plantings on the property are native to the area or tolerant of climate, soils and natural water availability. The property has a plan for the removal of plants that are not tolerant of the climate on the property. Gray water or rainwater is used for irrigation. The property uses automated sensors that measure soil moisture and water the landscape only when needed.

**(2.3.4) Towel and Linen Reuse Program**
The program conducts staff training and provides explanatory educational materials for guests.

**(2.5.2) Storage and Mixing of Cleaning and Pool Products**
Backflow prevention devices are used where closed dispensing systems are connected to the building water supply. The storage area for cleaning and pool products has direct access to fresh air ventilation.

**(2.5.3) Chemical Storage**
All chemicals for cleaning products are portion-controlled products, or are stored and mixed using portion-control dispensing systems.

**(2.5.4) Integrated Pest Management**
The property uses Integrated Pest Management techniques, or insecticides, fertilizers and biocides that are natural or Certified Organic.

# GS-33 Appendix 4 – Examples of Energy-Efficient Kitchen Appliances (Informative)

For informational purposes. The following definitions are adopted from the ENERGY STAR website.[19]

**Dishwashing Machine:** An appliance that cleans and sanitizes cooking and food-service items by applying sprays of detergent solution and a sanitizing final rinse. Dishwashers must meet ENERGY STAR requirements, or equivalent, in order to be considered energy- and water-efficient.

**Commercial Deep-Fat Fryer:** An appliance or cooking vessel that immerses food completely in hot oil. The oil is heated by an immersed electric element or band-wrapped vessel (electric fryers), or by gas burners (gas fryers). Fryers must meet ENERGY STAR, PGandE or CEE requirements, or equivalent, in order to be considered energy-efficient.

**Griddles:**

- Single-Sided Commercial Griddle: A commercial appliance that cooks food in oil or its own juices by direct contact with a single thermostatically-controlled plate. Griddles can be flat or grooved.
- Double-Sided Commercial Griddle: A commercial appliance that cooks food in oil or its own juices by direct contact with two hot thermostatically-controlled surfaces. Double-sided griddles have hinged upper-griddle plates (platens) that swing down over the food, thereby cooking the food from both sides at once.
- Fry-Top Range: A multi-purpose appliance used for surface cooking by direct contact with a heated plate, and may also function as a device for roasting, broiling, grilling or any combination of these methods. A fry-top range may be mounted above an oven, shelving or a refrigerated base.

Griddles must meet PGandE's specifications, ENERGY STAR, or equivalent, in order to be considered energy-efficient.

**Commercial Hot Food Holding Cabinet:** An appliance that holds hot food, cooked in a separate appliance, at a specified temperature. Hot Food Holding Cabinets must be listed with ENERGY STAR, PGandE, CEE, or equivalent, in order to be considered energy-efficient.

**Ice Machine:** An appliance that makes and harvests ice. Ice machines consist of a condensing section and an ice-making section, and may also store or dispense ice. Ice machines must meet ENERGY STAR guidelines, or equivalent, in order to be considered energy-efficient.

**Solid Door Refrigeration:**

- Commercial Refrigerator: A cabinet that stores food or other perishable items at temperatures between 32 and 40 degrees F.
- Commercial Freezer: A cabinet that stores food or other perishable items at temperatures below 0 degrees F.
- Commercial Refrigerator-Freezer: A cabinet that stores food or other perishable items, and has at least one compartment at temperatures between 32 and 40 degrees F, and at least one at temperatures below 0 degrees F.
- Commercial Ice Cream Freezer: A cabinet that stores food or other perishable items at temperatures below –5 degrees F.
- Self-contained Refrigeration Cabinet: A refrigerator, freezer, or refrigerator-freezer which has the condensing unit built into the cabinet.

Must meet ENERGY STAR guidelines or be listed with PGandE or CEE to be considered energy efficient, or equivalent.

[19] *http://www.energystar.gov/*

**Steam Cooker (Compartment Steamer):** An appliance cooks food using steam as a heat source. Steam cookers may be mounted on countertops, walls, stands, pedestals or cabinet-style bases. Steam cookers must meet ENERGY STAR requirements, or equivalent, in order to be considered energy-efficient.

**Commercial Oven:** An appliance that heats, roasts, or bakes food by conduction, convection, radiation, or electromagnetic energy. Ovens must meet PGandE's specifications, ENERGY STAR requirements, or equivalent, in order to be considered energy-efficient.

**CEE.** Consortium for Energy Efficiency
**PGandE.** Pacific Gas and Electric Company

# GS-33 Appendix 5 – Examples of Energy-Efficient Lights* (Informative)

For informational purposes. The following definitions are adopted from PHOTON-L[20] and Efficiency Maine.[21]

**Compact Fluorescent Light Bulb (CFL):** A compact fluorescent light bulb is compressed into the size of a standard incandescent light bulb. CFLs use 20%–35% of the energy used by incandescent lamps to provide the same amount of illumination and last 10 times longer.

Light is produced in a CFL tube by an electric current conducted through mercury and inert gases. Fluorescent lamps require a ballast to regulate operating current and provide a high start-up voltage; the ballast is integrated into the base of CFLs so that they can be installed in a standard light socket. Special ballasts are needed to allow dimming of fluorescent lamps. Examples of energy-efficient CFLs are listed by ENERGY STAR and Green Seal.

**Cold Cathode:** A tubular light that works by passing an electrical current through a gas or vapor. Cold cathode lights can come in many sizes and colors. They do not get hot and last longer than other lighting fixtures, at about 50,000 hours. Unlike incandescent bulbs, their longevity is not shortened by turning them off and on.

**Light-Emitting Diodes (LEDs):** A semi-conducting device that can produce a wide variety of colors of light, using about 20% of the energy than an incandescent bulb, and generating much less heat. These lights can be used for general illumination and for providing colored light. Examples of energy-efficient LEDs are listed by ENERGY STAR.

**Fluorescent Light Fixture (Luminaire):** A complete lighting unit consisting of lamps and ballasting, together with the parts designed to distribute the light, position and protect the lamps, and connect the lamps to the power supply.

**Standard (First Generation) T8 Lamps:** T8 lamps have replaced T12s as the standard fluorescent lamp for commercial and industrial lighting. These 1" diameter lamps offer higher efficacy, better lumen maintenance, and truer color rendering. CEE provides guidance on energy-efficient versions of T8.

**High Performance T8 Systems:** Lamp and ballast systems that offer higher efficacy levels, longer lamp life, and longer warranties than standard T8 systems, are available at variety of wattages, and can provide dramatic savings.

**T5 Systems:** T5 fluorescent lamps, at 5/8" in diameter, are smaller than T12 and T8 lamps, and are not designed to replace them since they come in metric lengths. T5 systems are no more efficient than standard T8 systems and are less efficient than High Performance T8 systems. However, T5 lamps are very effectively used in special fixtures that shape light to deliver it greater distances, or to spread light across a surface.

**Note: Halogen lighting is not considered energy-efficient.*

[20] *http://www.photon-l.com/technology/led-basics/glossary-of-led-terms.html*
[21] *http://www.efficiencymaine.com/docs/LinearFluorescentLighting.pdf*