# Energy & Sustainability Services Guide

NEWMARK

PROPERTY MANAGEMENT SERVICES
**JULY 2023**

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# How To Guide

## Energy and Sustainability Services (ESS) Reference Guide

This ESS Reference Guide has been developed to assist property teams in reducing the environmental and social impact of property operations, maintenance, and construction associated with real estate assets.

Many of practices and recommendations in this guide:

- Can be implemented at low to no incremental cost
- Can lead to energy, water, and waste efficiencies that result in ongoing operational savings
- Serve as a resource in achieving sustainability goals
- Help guide conversations with vendors
- Education on trends, common environmental labels, and standards for products, practices, and audits
- Help prepare the property for obtaining a green building certification

Any decision that results in a material operational change or economic variance should first be discussed with the Asset Manager/Owner.

This reference document has been developed to serve as a guide and may need to be adjusted depending upon the building, tenancy, ownership strategy, and asset location.

*NOTE: This document will be updated annually. Please be sure to refer to the most current release.*

# What is ESG+R

## Initiatives which were once known as “Green” then “Sustainable” have now expanded to include Environmental, Social, Governance, and Resilience (ESG+R) factors.

There has been an increased focus from both consumers and investors – on how companies are addressing ESG+R factors throughout their organizations. This includes understanding how a company utilizes natural resources and reduces pollution; how they treat their employees and the communities in which they operate; and how their executive team complies with regulations and reports to local and global initiatives; among many others.

Examples of ESG+R topics that most impact the commercial real estate sector are shown in the figure below:

**ENVIRONMENTAL**

### Environmental

- Energy Efficiency
- Water Efficiency
- Climate Change Adaption
- Greenhouse Gas (GHG) Emissions
- Waste and Recycling
- Building Materials
- Biodiversity and Habitat

**SOCIAL**

### Social

- Stakeholder Engagement
  - Local Communities
  - Tenants
  - Suppliers
- Working Conditions, including Labor Laws
- Health and Safety
- Employee Relations and Diversity

**GOVERNANCE**

### Governance

- Leadership and Oversight
- Reporting and Disclosure
- Anti-Bribery & Anti-Corruption
- Board Diversity and Structure
- Conflicts of Interest
- Regulatory:
  - Energy disclosure
  - Carbon emissions limits
  - Energy efficiency standards

**RESILIENCE**

### Resilience

- Risk Management
  - Physical Risk
  - Transition Risk
- Strategy and Policy
- Portfolio Climate-Risk Evaluation

We are entering an age of increased environmental regulations, and growing tenant demand for greener buildings, and investors mandating ESG+R programs and transparent reporting. Improving the environmental performance and reducing carbon emissions of properties are vital in order to comply with regulations and remain competitive.

## Climate change refers to a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer.

One factor contributing to climate change is the increase in greenhouse gases emitted into the atmosphere through the burning of fossil fuel such as coal, oil, and natural gas to produce energy. Primary greenhouse gases are carbon dioxide, methane, nitrous oxide, and ozone. These gases can raise the Earth's average surface temperature which is commonly referred to as global warming.

Buildings have a direct relationship with the amount of greenhouse gases emitted to the atmosphere due to the consumption of electricity. By changing the way buildings operate and implementing initiatives, they can have a significant impact on climate change.

Together, building and construction are responsible for 39% of all carbon emissions in the world, with operational emissions (from energy used to heat, cool and light buildings) accounting for 28%. The energy intensity of the global buildings sector needs to improve on average by 30% by 2030 (compared to 2015) to be on track to meet global climate ambitions set out in the Paris Agreement, according to the Global Status Report 2017 published by UN Environment and the International Energy Agency.

This guide contains ways to reduce greenhouse gas emissions, as well as ways to adapt to climate change. Adaption to changes in the regulatory environment, the physical environment, and consumers' demands will support the long-term success of the property.

# Building Certifications

Green building certifications help guide, demonstrate, and document efforts to deliver sustainable, high-performing spaces. They provide a third-party validation for efforts in increasing energy and water efficiency, reducing greenhouse gas emissions, improving indoor environmental quality and occupant wellness, and fostering community and social engagement at the building level.

Most green building certifications have the following main elements:

- Energy
- Water
- Waste
- Indoor Air Quality
- Location & Transportation
- Materials

## New Construction Certifications

Green building certifications for new construction (or significant renovation) focus on the location, design, planning process, materials used, and actions taken during the development and construction phases of a building.

## Existing Building Certifications

Green building certifications for existing buildings focus on the operation and maintenance of a building – how sustainably the building runs during its lifecycle.

| CERTIFICATION | OVERVIEW | PHASE |
|---|---|---|
| LEED | – Most recognized third party verified green building rating system in the U.S.<br>– Buildings must meet prerequisites in 5 categories<br>– Point-based system with Certified, Silver, Gold and Platinum ratings<br>– LEED released pilot rating system, v4.1, and new Recertification Guidance in 2018<br>– Certification based on Performance Scores within Arc software<br>– Recertification required every three years under new rating system<br>– LEED v4 (traditional rating systems) still available for properties to pursue | – New Construction<br>– Fit Outs<br>– Interior Space<br>– Existing Building |
| BREEAM® | – New to the U.S. in 2017, BREEAM is the world's first and most widely used sustainability assessment method<br>– No prerequisites or requirements to change existing building.<br>– Requires recertification every 3 years<br>– Point-based system with Acceptable through Outstanding ratings | – New Construction<br>Existing Building |
| IREM CERTIFIED SUSTAINABLE PROPERTY | – Attainable, affordable, and meaningful recognition program<br>– Less stringent requirements for multi-family and retail properties compared to other green building certifications<br>– Minimum 18 months of 75% (or greater) occupied<br>– Requires recertification every 3 years<br>– Single Certification designation | – Existing Building |
| GREEN GLOBES BUILDING CERTIFICATION | – Program aims to provide customized guidance in<br>– the operation of high-performance buildings through checklist approach<br>– No prerequisites or requirements to change existing building.<br>– No certification renewal required<br>– Point-based system with 1 through 4 Green Globes ratings | – New Construction<br>– Interior Space<br>– Fit Outs<br>– Existing Building |
| BOMA 360 PERFORMANCE PROGRAM | – Very affordable<br>– Office and Industrial<br>– Minimum points required in each category<br>– Tenant utility data not required<br>– Tenant participation required (not a lot)<br>– Participation in BOMA Industrial Experience Exchange Report (EER) Survey annually<br>– Renewal every 3 years | – Existing Building |

# Energy Star

All Newmark managed office properties containing more than 25,000 RSF are required to create and maintain an ENERGY STAR Portfolio Manager account. Once the account is created, it is to be shared with the Energy & Sustainability Services Team, Craig Flinn and Matt Wells. The objective of this policy is to improve energy consumption efficiency, reduce cost, optimize capital investment for energy efficiency, reduce environmental and greenhouse gas emissions, and conserve natural resources.

## ENERGY STAR Portfolio Manager

ENERGY STAR Portfolio Manager, a joint project between the U.S. Environmental Protection Agency and the Department of Energy, is a free online tool for measuring an existing building's energy and water consumption and cost, as well as waste production and hauling cost.

## Energy Star Benchmarking and Rating

For buildings that track whole building (landlord and tenant) energy usage in ENERGY STAR Portfolio Manager, the tool provides an energy efficiency rating, called the ENERGY STAR score, on a scale of 1 to 100. This is referred to as **ENERGY STAR Portfolio Manager benchmarking.**

Properties without whole building data can still be benchmarked using landlord-only energy data to track the property's energy intensity over time. The energy intensity can also be compared with the energy intensities of similar properties.

## Energy Star Certification

Buildings performing in the top 25% of comparable buildings, with a score of 75 or above, are eligible to apply for ENERGY STAR certification. Newmark is a member of Energy Star Certification Nation.

To earn the certification, the property must be benchmarked with at least 12 months of whole building energy data. ENERGY STAR certification focuses on the energy efficiency performance of existing buildings.

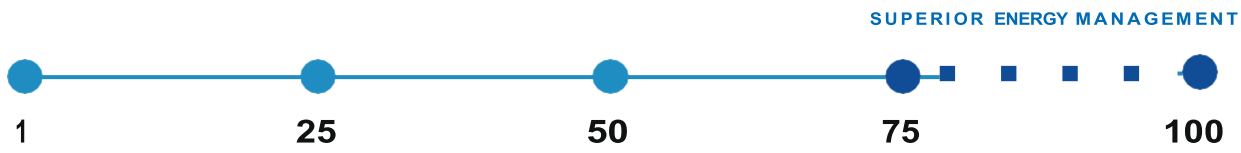
| ONLY CERTAIN PROPERTY TYPES ARE ELIGIBLE FOR ENERGY STAR CERTIFICATION: | | |
|---|---|---|
| – Office | – Hotel | – Retail – Single store* |
| – Industrial – Distribution Center | – Data Center | – Retail – Supermarket |
| – Industrial – warehouse / Manufacturing | – Bank Branch | – Retail – supercenter* |
| – Industrial – Refrigerated warehouse | – Multi-family Housing | |

**A retail property with multiple stores that is benchmarked together in ENERGY STAR Portfolio Manager is ineligible for a score and certification.*

**APPLYING FOR THE ENERGY STAR CERTIFICATION:**

- Qualifying properties scoring 75 or above will apply annually for the ENERGY STAR certification.
- Annually budget ENERGY STAR certification each year

**1 TO 100 ENERGY PERFORMANCE SCALE**




**In order to improve the ENERGY STAR Score, the property needs to reduce energy consumption. There are multiple other factors that can affect the score and need to be accurate. The following are some factors to consider:**

- Occupancy
- Weekly Operating Hours
- Worker Count
- Number of Computers
- Tenants working longer hours than usual

**Make sure to update the ENERGY STAR account on a quarterly basis with the latest occupancy, weekly operating hours, worker count and number of computers. For assistance, please reach out to Newmark's ESS team.*

## Using Portfolio Manager

- Measure and monitor building energy, water, and waste usage/generation and costs, and conservation measures being taken at the property. Update monthly.
- Update building characteristics, operating data including occupancy/vacancy, tenant and computer counts, energy data and water data least on an annual basis.
- Be aware of any building benchmarking legislation passed in jurisdictions and ensure the building is in compliance with any such ordinances and requirements, including the sharing of ENERGY STAR Portfolio Manager account data as required by law.

## Benchmarking Energy

- For energy cost, load the total current cost on the bill including fees and taxes but do not include cost from previous unpaid balance.
- Appropriately sub-meter tenants for above-standard energy consumption and after-hours HVAC usage.
- Verify the energy meter units for each meter from copies of your energy bills. If the units on the billing are not listed or are unclear, contact your energy provider to confirm the correct units for your meter.
- If available, load at least 12 months of historical data. If there are Data Centers in the building (see section on Data Centers as defined by ENERGY STAR), IT only readings in kWh must be taken at the Uninterruptible Power Supply (UPS) and loaded into ENERGY STAR Portfolio Manager monthly. Verify the water meter units for each meter from copies of the water bills. If the units on the billing are not listed or are unclear, contact the water provider to confirm the correct units for the meter.

| COMMON TYPES OF UNITS FOR ENERGY METERS INCLUDE: | |
|---|---|
| – kWh<br>– kBtu<br>– GJ<br>– MBtu | – MWh<br>– ccf (hundred cubic feet)<br>– cf (cubic feet)<br>– therms |

## Benchmarking Water

- Classify meters for plumbing, restaurants, cooling tower make-up water and other process water as “Potable Indoor.”
- Classify meters for irrigation and water features as “Potable Outdoor.”
- If billed for one main water meter serving the property and a submeter is installed (i.e., for irrigation), then set these up as two individual meters in Portfolio Manager and classify per instructions above. To enter data for the main water meter, manually subtract the sub-meter consumption from the main water meter consumption
- on your bill. To allocate cost, prorate the total amount on the bill based on usage for each use (i.e., domestic and irrigation).
- Load water consumption only. Do not load sewage.
- For water costs, load the TOTAL cost on the bill including water consumption, sewage charges, stormwater fees and other charges. Do not break out the sewage by volume or cost.
- If available, load at least 12 months of historical data.
- Verify the water meter units for each meter from copies of the water bills. If the units on the billing are not listed or are unclear, contact the water provider to confirm the correct units for the meter.

## Benchmarking Waste

- Track waste in ENERGY STAR Portfolio Manager is similar to how tracking energy and water is tracked
- Classify waste meters for trash, mixed recyclables, and other types such as cardboard, compost, glass, etc.
- Waste meters can be tracked on a regular basis or one-time event. Use regular basis for waste that is being picked up on a weekly schedule. Use one-time events for waste drives
- Waste can be tracked by weight/volume or it can be tracked based on the number of containers, size of containers and number of pick-ups a week. Contact your waste hauler if waste data is unknown. If the weight/volume is provided on the invoice, by the waste hauler or third-party waste consultant, enter the waste amount. Verify waste units, if units are unclear or not listed, contact your waste hauler.
- Where the weight/volume is unknown, enter the number of containers, size of containers, and number of pickups for each waste type (trash, mixed recyclables, compost, etc.) If this option is used, select 100% for Average Percent Full.
- If waste cost is available, enter cost data in ENERGY STAR Portfolio Manager
- If available, load at least 12 months of historical data.

| COMMON TYPES OF UNITS FOR WASTE INCLUDE: | |
|---|---|
| – pounds (lbs)<br>– Tons | – kilograms (kg)<br>– metric tonnes (mt) |

## Tracking And Reporting All Green Power

All onsite green power and utility green power purchases must be recorded in the property's ENERGY STAR Portfolio Manager account.

## Data Center Within the Premises

As defined by EPA's ENERGY STAR, a Data Center applies to spaces specifically designed and equipped to meet the needs of high-density computing equipment, such as server racks, used for data storage and processing.

Typically, these facilities require dedicated, uninterruptible power supplies and cooling systems. Data Center functions may include traditional enterprise services, on-demand enterprise services, high-performance computing, internet facilities and/or hosting facilities.

The Data Center space is intended for sophisticated computing functions; it is not used to represent a server closet or computer training area. The total gross floor area is measured between the principal exterior surfaces of the enclosing fixed walls and includes all supporting functions of the data center. This includes the entire data center, which may have raised-floor computing space, server rack aisles, storage silos, control console areas, battery rooms, and mechanical rooms for cooling equipment.

The IT Energy Configuration field within ENERGY STAR Portfolio Manager designates the location of the IT energy meter. The preferred location of this meter is at the output of the Uninterruptible Power Supply (UPS). Please refer to the definition of IT Energy (following) for other meter locations, which are permitted under certain conditions when UPS readings are not available.

- The IT Energy is defined as the total amount of energy required by the server racks, storage silos and other IT equipment in the Data Center.
    - The IT Energy is measured at the output of the Uninterruptible Power Supply (UPS).
    - These measurements are taken as energy readings in kWh. They are not instantaneous power readings. Best practice is to record measurements at least monthly.
- Facilities that do not have a UPS system are permitted to supply readings from a Power Distribution Unit (PDU).
- In these cases, the meter that is recording the readings must be located at the input to the PDU.
- Facilities for which more than 10% of the UPS load is directed to non-IT (e.g., mechanical) equipment are required to provide a reading that excludes the non-IT equipment. Two options are permitted:
    - If energy used by non-IT equipment is measured, it may be subtracted from the total UPS energy, and the remainder are entered into the UPS Output Meter in Portfolio Manager.
    - If energy used by non-IT equipment is not measured, supply a reading from the input to the PDU meters that support the IT equipment.

**As of August 2018, Portfolio Manager allows properties with data centers to input estimated IT values and still be eligible for an ENERGY STAR Score and ENERGY STAR Certification. Estimated IT readings are calculated within Portfolio Manager, not by the property team. When setting up a data center within a property, the property team now has the option to select whether they would like to use estimates or actual IT readings.*

*It is recommended to test both options to determine how the estimates and readings will affect the energy star score.*

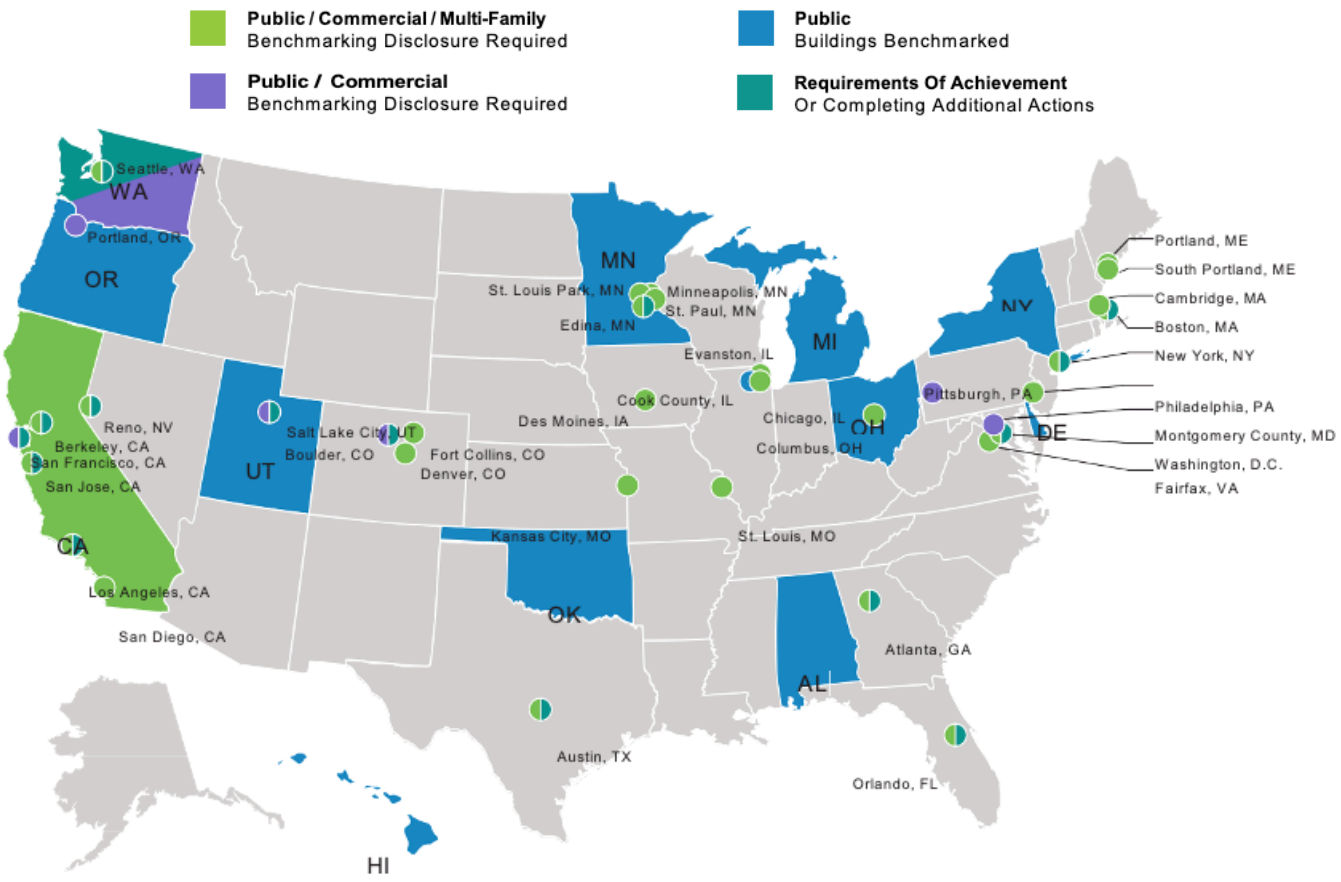
# Legislated Benchmarking

## Using Energy Star Portfolio Manager

As of December 2022, the following cities, counties, and states have passed laws requiring benchmarking of properties in ENERGY STAR Portfolio Manager.

## Building Benchmarking Ordinances in The United States

*As of December 31, 2022*



# Benchmarking Ordinance Calendar

| MONTH | DATE | LOCATION | PROPERTY TYPE | REPORTING |
|---|---|---|---|---|
| MARCH | 1st | Fairfax, VA | All | Recycling |
| | | Fort Collins, CO | Commercial | Energy, Water |
| APRIL | 1st | District of Columbia | All | Energy, Water |
| | | Reno, NV | All | Energy, Water |
| | | San Francisco, CA | Commercial | Energy, Water |
| | 22nd | Portland, OR | Commercial | Energy |
| MAY | 1st | Cambridge, MA | All | Energy, Water |
| | | Des Moines, IA | All | Energy, Water |
| | | Kansas City, MO | All | Energy, Water |
| | | New York City, NY | All | Energy, Water |
| | | Orlando, FL | All | Energy, Water |
| | | Portland, ME | All | Energy, Water |
| | | St. Louis, MO | All | Energy, Water |
| | | Salt Lake City, UT | Commercial | Energy |
| | | San Jose, CA | All | Energy, Water |
| | 15th | Boston, MA | All | Energy, Water |
| JUNE | 1st | Atlanta, GA | All | Energy, Water |
| | | Austin, TX | All | Energy |
| | | Boulder, CO | Commercial | Energy |
| | | California State | All | Energy |
| | | Chicago, IL | All | Energy |
| | | Columbus, OH | All | Energy, Water |
| | | Denver, CO | All | Energy |
| | | Los Angeles, CA | All | Energy, Water |
| | | Minneapolis, MN | Commercial | Energy, Water |
| | | Montgomery Co., MD | Commercial | Energy |
| | | Pittsburgh, PA | Commercial | Energy, Water |
| | | San Diego, CA | All | Energy |
| | | St. Paul, MN | All | Energy, Water |
| | 30th | Evanston, IL | All | Energy, Water |
| | | Philadelphia, PA | All | Energy, Water |
| JULY | 1st | Berkeley, CA | All | Energy |
| | | Seattle, WA | All | Energy |
| AUGUST | 15th | San Diego, CA | All | Recycling |
| OCTOBER | 1st | Austin, TX | All | Recycling |
| ANNUALLY | -- | Dallas, TX | Multi-family | Recycling |
| TRANSACTION | -- | Berkeley, CA** | All | Energy |
| | -- | Washington State** | All | Energy |

*** Triggered at point of a transaction*

*All properties located in the cities/states with benchmarking ordinance must comply unless the property is exempt. Please be aware of the benchmarking laws in the city where the property is located, whether the property needs to comply, or if it is exempt for that year. Dates listed above are subject to change check the energy star website for the most current deadlines.*

# Energy Performance and Greenhouse Gas Ordinances

Over the last few years, a growing trend of energy performance and greenhouse gas (GHG) emission ordinances for commercial real estate have been approved by local municipalities. These ordinances will soon mandate performance requirements or

GHG emission targets for commercial and multi-family properties. These targets will require property owners to improve the efficiency of their assets or potentially face substantial fines or penalties based on energy performance or emissions.

## New York City

The city set an annual cap on carbon emissions for buildings over 25,000 SF starting in 2024 which will become more stringent in 2030, this is also known as NYC Local Law

97 (LL97). There will be flexibility to comply through specified renewable energy credits and/or emissions offsets (still under review). Compliance may be achieved through the completion of specified projects outlined in the legislation, many of which fall in line with quality property management.

The performance penalty is $268 per metric ton of carbon over the limit per square foot. Failure to report energy performance to the City results in a monthly fine of $0.50 per square foot.

| Property Type | Carbon Limit KG $CO_2$ e/SF | Carbon Limit KG $CO_2$ e/SF |
|---|---|---|
| **LIMITS PER YEAR** | **2025 - 2029** | **2030 - 2034** |
| **OFFICE** | 8.46 | 4.53 |
| **RETAIL** | 6.75 | 4.07 |
| **HOTEL** | 9.87 | 5.26 |

## Boston, MA

Starting in 2022, BERDO 2.0, requires that all large buildings (20,000SF +) report their annual energy and water use to the City of Boston. The legislation outlines the financial implications for buildings that operate above the targeted emissions level. The current penalty is $234/ton of CO2 emissions over the target.

## Washington D.C.

The new ordinance in Washington D.C., to be enacted in 2021, will require all buildings to meet yet-to-be-determined energy use standards or improve the building's energy performance by 20%. The DOEE's new program is called the Building Energy Performance Standard (BEPS). BEPS was created to help meet the energy and climate goals of the Sustainable DC Plan – to reduce greenhouse gas emissions and energy consumption by 50% by 2032.

The implementation of the ordinance will be rolled out based on square footage:

- Buildings over 25,000 SF will need to comply starting January 1, 2023
- Buildings over 10,000 SF will need to comply starting January 1, 2026

## San Francisco, CA

San Francisco is aiming to run on 100% renewable electricity by 2030. This currently only applies to commercial buildings. The ordinance will be monitored for changes as it develops. Renewable energy can be obtained from Renewable Energy Credits (RECs), purchasing it directly from the utility provider, and onsite renewable technology.

The implementation of the ordinance will be rolled out based on square footage:

- Buildings between 250,000 SF and 500,000 SF have until 2024
- Buildings between 50,000 and 250,000 have until 2030

Please reach out to Newmark ESS for REC purchases.

## Other Markets

The Newmark ESS Team will continue to monitor this trend nationwide and will provide updates and summaries of approved legislative changes when information is made available.

# Benchmark Rating Display

## Cities are starting to require buildings to post a letter grade on their buildings based on the ENERGY STAR score of their building.

### Chicago Rating

The rating system is based out of 4 stars and first went into effect in 2019. Buildings that do not comply with the energy benchmarking requirements will receive 0 out of 4 stars Properties that are not eligible to receive an ENERGY STAR score will be assigned a rating based on energy use per square feet compared to national medians. Once rating is assigned, the owner must post in a prominent location in the building and share it at time of listing the property for sale or lease. If a property improves its ENERGY STAR score by 10 points or more, it receives an extra star as recognition.

### Chicago Energy Rating

| STARS | 4 | 3.5 | 3 | 2.5 | 2 | 1.5 | 1 |
|---|---|---|---|---|---|---|---|
| ENERGY STAR SCORE | 81-100 | 71-80 | 61-70 | 51-60 | 41-50 | 31-40 | 1-30 |
| IMPROVEMENT | Score of 61-80 and had 10-point improvement in the past 2 years | – | Score of 41-60 and had 10-point improvement in the past 2 years | – | Score of 11-40 and had 10-point improvement in the past 2 years | – | – |

### New York City Rating

Modeled after New York City's restaurant grades, Local Law 33 requires owners to post the energy efficiency grades on their buildings since 2020. Under this law, people entering NYC buildings will immediately see the energy grade.

### New York City Energy Rating

| GRADE | A | B | C | D | F | N |
|---|---|---|---|---|---|---|
| ENERGY STAR SCORE | 85+ | 84-70 | 69-55 | 54-0 | Not Submitted | Exempted from Benchmarking |

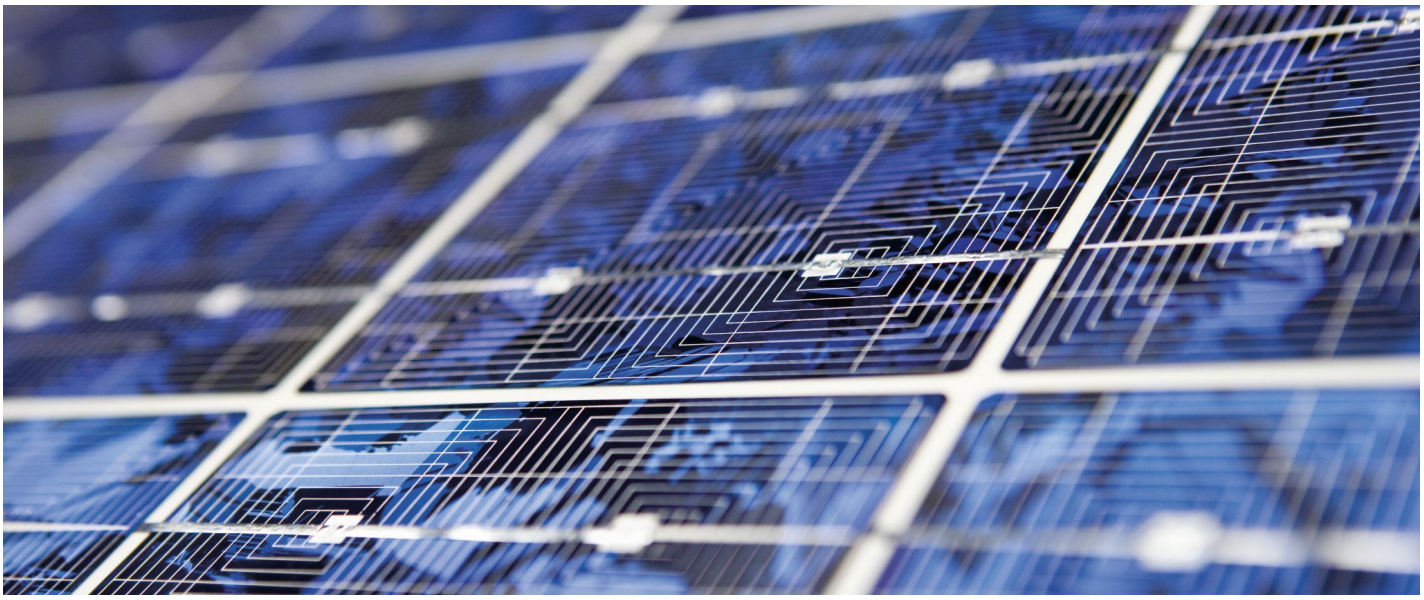
# Energy Efficiency

No-cost and low-cost opportunities exist to improve the useful life and energy efficiency of buildings. Implementing energy efficiency measures conserves energy and, in turn, lowers overall operating expenses. Another added benefit to reducing energy usage is the reduction of greenhouse gas emissions.

## Energy Efficiency Program Suggested Steps:

1. Set short- and long-term energy reduction goals.
2. Track energy usage and cost using the property's ENERGY STAR Portfolio Manager account.
3. Identify and implement no-cost and low-cost Energy Conservation Measures (ECMs) and track the implementation of energy saving measures.
4. Seek and apply for financial incentives or rebates for energy conservation measures. Check the Database for State Incentives for Renewables and Efficiency to see what incentives and rebates might be available for the property.
5. Perform outreach initiatives that encourage continuous energy conservation by occupants, guests, service providers, vendors, and employees.

*For properties not performing in the top 25% of comparable buildings (i.e., an ENERGY STAR score below 75), investigate energy audits offered by Newmark ESS. The audit will result in a list of energy conservation measures that can be implemented at the building.*



# Lighting, Timers & Sensors

## Natural Light Sources

Utilize natural light sources wherever possible

- Reduces energy usage
- Increases health and well-being and productivity of building occupants
- Strategically place clerestory glass (skylights and high windows)

## Identify Improvement Opportunities

Identify improvement opportunities (lamp/fixture upgrades, lighting controls)

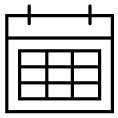
- Contact Newmark ESS to conduct a lighting audit on the property, grounds, and parking
- Ask Newmark ESS about available incentives

## Light Emitting Diode LED's

- Purchase LEDs lamps
- LEDs have a longer life than compact fluorescent, halogen incandescent lamps
- MR16 bulbs are halogen and use 20 to 50 watts compared to LED lamps, which use 1 to 8 watts & generate less heat
- MR16 halogen bulbs generate substantial heat and have a much shorter lifespan than LEDs.
- Convert T-12 fixtures to LEDs lamps
- In 24/7 usage applications, upgrade to LED fixtures.
- New LED lamps are 50% more efficient than the equivalent fluorescents.
- Use exit signs that are LED
- Upgrade elevator cab lighting to LED
- The lighting for these applications typically runs longer hours and will have a faster payback.
- Replace metal-halide fixtures with new LEDs for parking lot and wall pack lighting.
- Payback for replacing wall packs is typically less than three years, while pole lights can take longer

## Lighting Sensors and Timers

- Evaluate the installation of occupancy sensors in areas where lights are on 24/7, such as enclosed hallways, emergency stairwell exits and enclosed parking garages.
- While this measure can save additional energy and money, it is difficult to properly execute.
- Be sure to check local code requirements, use a very experienced vendor and always test first.
- Install photo sensors, vacancy sensors, dimmers, and timers in the common areas.
- Low-cost lighting controls ensure lights will not be left on in unoccupied or naturally lit areas.
- Photo sensors can be used in most exterior lighting applications, as well as naturally lit indoor areas such as lobbies and mailrooms.
- Vacancy sensors work well in fitness centers, restrooms, mechanical rooms, electrical and telecom rooms, conference or business centers, janitorial closets, and trash collection room

| LED BULB EFFICIENCY COMPARISON | | |
|---|---|---|
|  |  |  |
| 20% | 80% | 3-25x |
| **LED bulbs use less energy than compact fluorescent bulbs** | **LED bulbs consume less energy than an incandescent bulb** | **LED bulbs last longer than traditional bulbs** |

*Source: energy.gov*

There are many inferior lighting products on the market. It is recommended review technical specifications and warranties. To avoid inferior products, it may be best to pay ~6-10% more on a project for quality products made by Phillips, GE, Sylvania, or other well-known brands.

If no option exists for LED replacement for current lamps/fixtures, purchase CFLs replacements, which use up to 80% less energy than incandescent lamps.

| AVAILABLE LED UPGRADES - LAMPS AND FIXTURES | | |
|---|---|---|
| T8 and T5 | A19 | MR16 |
| Wall Packs | GU24 | MR 8/11 |
| Downlights | Decorative | Exterior Pole Lighting |

# HVAC Equipment

- In vacant spaces, turn HVAC off or to minimal temperature settings of 68° F or lower during colder months and 78° F or higher during warmer months, weather permitting.
- Program appropriate night setback temperatures
- Conduct a detailed schedule and ensure the HVAC equipment time of day schedules (TOD) match the occupied TOD schedule.
- Implement an on-request approach to after-hours HVAC service.
- Adjust building operating hours to reflect actual physical occupancy.
- Adjust dampers to bring in the least amount of outside air (OA)
- Only bringing in the necessary amount of outside air to maintain property air quality will minimize the need to condition outside air.
- Optimize startup time and equipment sequencing.
- Start up, staging and sequencing are comprised of equipment timing, both at the time and how many pieces of equipment turn on at the same time
- Sequence the equipment load same times
- For buildings with a Building Automation System (BAS), use the optimized start feature
- Schedule seasonal changes to thermostats.
- Temperatures in the cool seasons need to be different from temperatures in the hot seasons
- Calibrate thermostats
- Periodically walk through the building and comparing the thermostat setting with a handheld digital thermostat to ensure thermostat settings equal actual space temperature.
- Experiment to determine the earliest possible time the systems can be powered down while maintaining tenant comfort.
- Outside air temperature changes decrease the end of the workday.
- Coasting the last hour of operations may not cause a noticeable difference in comfort level to the tenants.
- Regularly inspect all equipment and controls to ensure they are operating properly.
- Clean cooling coils to remove biofilm and/or dirt build-up, and replace filters per manufacturer's recommendations.
- Optimize chilled water and condenser water temperatures
- Consider O

A temperature lockout for heating equipment or OA changeover setpoint for maximizing economizer operation.

- Reduce supply duct static pressure to 1" water column or the lowest setpoint while still being able to maintain control of the VAV boxes.
- Check to see if any devices in hand operation are overridden in the BAS
- Consider maximizing free cooling when available.

- If outdoor air intake and general building exhaust system start at the same time as the HVAC equipment during morning warm up or energized unless conductive to building load.
- Install a return air reset or supply duct static setpoint, then the OA system pressure reset program to reduce the lowest should be energized to allow setpoint while still being able to maintain control for free-cooling and of the Variable Air Volume (VAV) boxes.
- Budget for boiler tune ups at least once every 2 years.
- Boiler maintenance conserves energy by ridding the system of debris and checking to ensure it is operating at maximum efficiency.
- A professional boiler tune-up typically includes measuring the system's combustion efficiency, adjusting air flow and draft control, reducing excessive temperatures, checking combustion air intake and cleaning the heat exchanger.
- Obtain bids to insulate water heater, boilers, hot water piping and tanks as well as all HVAC ductwork, to reduce heat loss.
- Evaluate the installation of variable frequency drive (VFD) and VAV systems.
- Motors and fans may not need to run at full speed at all times, due to varying levels of demand placed on the system at different points throughout the day.
- VFD (motors) and VAV (fans) pay for themselves rather quickly. Potential applications include cooling tower fans, air-handling unit fans, domestic water pumps and other motors.
- Relocate thermostats to optimal locations
- Thermostats are best located where they will give you the readings you want to send to your HVAC system.

# Demand Response

Increasingly, major utilities are including energy demand charges ($/kW) or peak consumption rates on monthly electricity invoices. These charges can make up to 25% of the total electric utility invoice cost in some markets. The utility companies have added these charges in hopes to lower the need for the older, less efficient, power stations that are used to meet peak events.

In order to lower these utility charges, the property must be able to lower the peak power load (kW) or peak consumption kWh. This may be accomplished by reducing the number of or intensity of building systems during peak times, which are established by the utility.

New technologies are entering the market to help property managers monitor and evaluate how best to lower demand. There is a growing market for connected sensors that is taking advantage of the

expansion of Internet of Things (IoT) technologies in commercial real estate. Sensors, cameras, and smart meters may be installed to provide real time data to property teams and third-party service providers.

## Examples of Potential Demand Response Methods May Include:

1. Turn-off non-critical lighting
2. Utilize onsite generator use or testing during peak events
3. Provide tenant education and plans
4. Avoid heavy maintenance activities
5. Adjust HVAC 2-3° Fahrenheit to reduce run-time depending on season

## Energy Audits

If the building is still not performing optimally, contact Newmark ESS to conduct ASHRAE Level I and Level II Audits and/or retro commissioning (RCx) if neither has been conducted within the last five years.

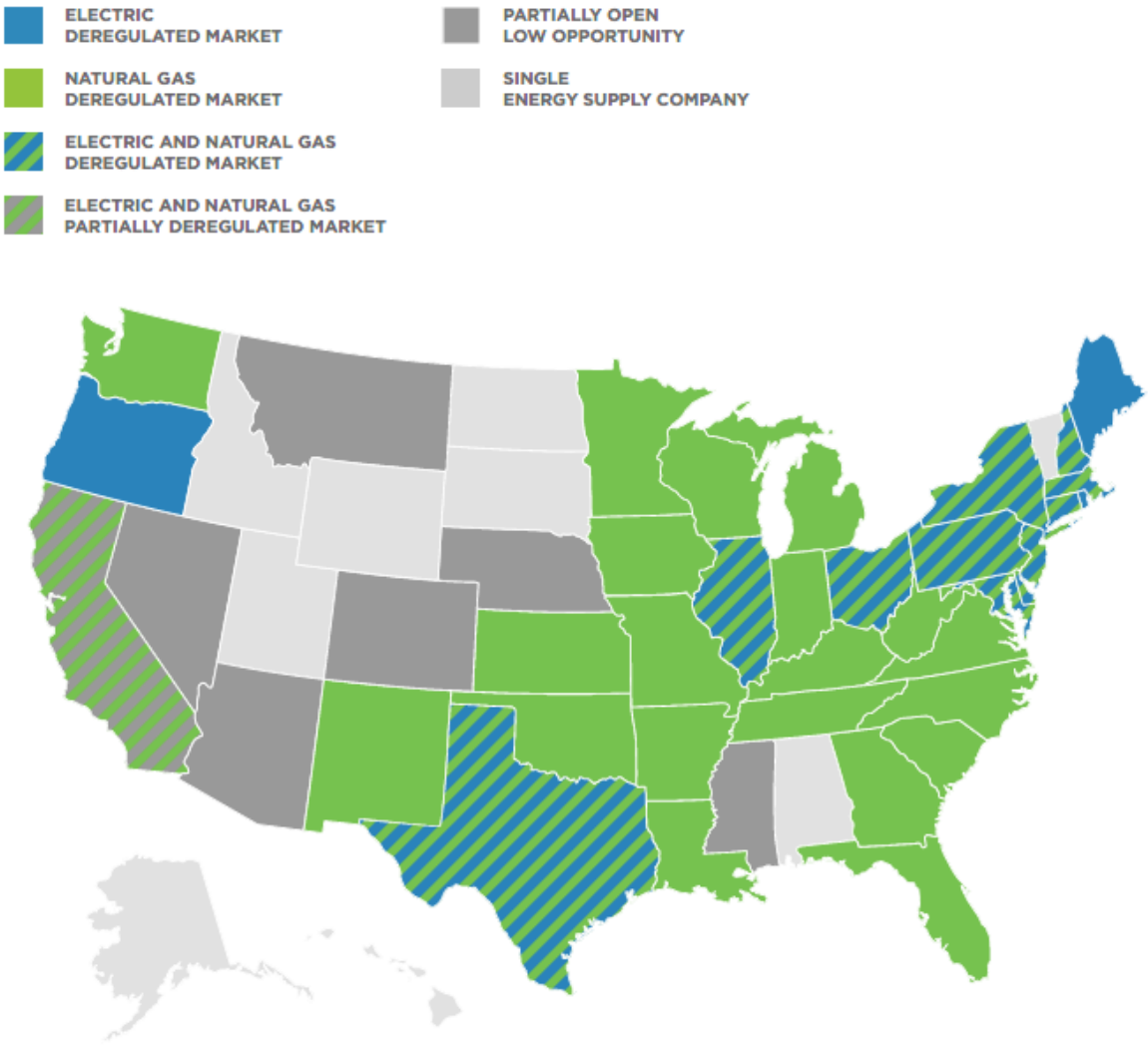
## Building Exterior

- Ensure properly sealing in all areas where two different building materials meet
- Plug and caulk holes or penetrations around faucets, pipes, electric outlets, and wiring.
- Look for cracks and holes in the mortar, foundation and siding, and seal with the appropriate material.
- Check the exterior caulking around doors and windows.
- Install weather stripping on doors and windows to eliminate drafts and air leakage.

# Energy Procurement

Some states in the U.S. offer a deregulated market for energy. In a deregulated market, the supply rates for energy will vary and are negotiable. This allows the consumer to compare and choose their energy supplier. Poor energy procurement decisions in these markets can be expensive due to price fluctuation. Having an effective energy procurement plan in place will help your property reduce risks, maximize cost benefits, and can assist in reducing greenhouse gas emissions by choosing green power over brown power. Newmark Property Management Policy is to contact Craig Flinn and Matt Wells for pricing.

## Deregulated Energy States and Markets Map



# Greenhouse Gas Emissions

Greenhouse gas is a gas that absorbs and traps heat in the atmosphere. The primary greenhouse gases are carbon dioxide, methane, nitrous oxide, and ozone. These gases can raise the Earth's average surface temperature which is commonly referred to as global warming.

Greenhouse gases are released primary through the burning of fossil fuels such as coal and natural gas to generate energy. Buildings have a direct relationship with the amount of greenhouse gases emitted to the atmosphere due to the consumption of energy for lighting, heating, and other various uses.

### To reduce greenhouse gases emitted from buildings, there are multiple ways:

- Reduce the energy consumption of the building
  - Through efficient operations
  - Through energy efficient projects (LED installation, efficient HVAC units, etc.)
- Install on-site renewable such as solar (the energy the building is consuming is not generated from fossil fuels)
- Purchase Green Power or Renewable Energy Credits
  - A lot of utilities will offer renewable energy options where the electricity that the building is consuming is from renewable sources such as wind or solar.
  - Purchasing renewable energy credits will allow the property to claim the electricity used by the building is from renewable energy.

# Renewable Energy

Renewable energy is created from renewable resources, such as wind, water, solar, and geothermal. The purchase, generation, and consumption of renewable energy helps to reduce the environmental impacts, such as greenhouse gas (GHG) emissions, associated with the generation of electricity for use in buildings. Renewable energy may be obtained from either onsite sources (e.g., solar photovoltaic panels) or offsite sources (e.g., a wind turbine farm).

## Onsite Renewable Energy

**Solar Panels**

The installation of on-site solar panels can offset grid purchases of electricity and help reduce monthly electric bill costs through reduced energy and demand charges. Additionally, there are a variety of federal, state, and local incentive programs that can diminish initial costs and improve project feasibility.

## Offsite Renewable Energy

**Renewable Energy Credits (REC's)**

Renewable Energy Credits (RECs) represent the ability to purchase the environmental, social, and other non-power attributes of renewable energy. In some cases, the purchase of RECs can earn points toward green building certifications.

*If you are considering solar or would like more information on the feasibility of solar for your property, please reach out to Matt Wells for additional information and support.*

## Green Power Purchases

There are various ways to purchase green power generated off-site.

- Purchase of green power products directly from the utility.
- Direct purchase from a third-party generator in deregulated electricity markets.
- Community Choice Aggregation (CCA) is available when a local government contracts for aggregate electricity supply, often renewable energy.
- The energy is distributed through existing utility distribution systems.
- CCAs are authorized in California, Illinois, Massachusetts, New Jersey, New York, Ohio, and Rhode Island
- The Green-e website provides options for certified green power,
- For corporate buyers who buy large-scale renewable energy through the grid, the World Resources Institute has a created a map of locations and information.

# Green Technology

## Battery Storage

Buildings with a high peak-demand can benefit from battery storage technology. Batteries are installed at the building onsite either indoors or outdoors. Due to fire safety issues/codes, it is preferable for batteries to be installed outdoors as opposed to indoors. The batteries are charged at night when electricity loads and costs are low. During the day when there are peak-

demand periods, the battery delivers the power that was stored to the building. This reduces the peak demand of the building and also lowers demand charges through load shifting while also reducing strain on the energy grid.

Battery storage projects require a large amount of up-front capital. There are multiple options to implement a battery storage project to make it economically feasible. Some of the options are:

- Purchasing the batteries and owning them
- Not purchasing the battery but having a third-party own and sharing the savings
- Not purchasing the battery but having a third-party own and get all the savings but receiving a rent payment through a lease agreement.

Most of the time utility incentives are necessary to improve the feasibility of the opportunity.

## Water Bottle Filling Stations

Evaluate the installation of a water bottle refilling station in common area(s) such as the lobby, cafeteria, fitness center, or leasing office. Retrofit kits are available for existing water fountains. One example is the retrofit kits found on the Elkay website.

## Smart Windows

Smart windows are one of the newer technologies that can benefit your property. This technology works by changing the tint level automatically according to light levels. This can

reduce solar radiation and glare but also admit natural daylight which can improve occupant comfort. This technology may require a large amount of up-front capital and may only make sense for certain property types such as office, airports, schools, healthcare and high-rise multi-family. One of the major players in this technology is View.

## Electric Vehicle Charging Stations

Evaluate the installation of Electric Vehicle Charging Stations. Electric vehicle supply equipment (EVSE) may be an opportunity to differentiate your property. Installing EVSE may attract and retain tenants and foster an environmentally sustainable property.

When considering adding charging stations to your property, it is important to remember that there may be infrastructure costs to consider in addition to the cost of the chargers themselves. Incentives are offered in most markets by government agencies, utilities, and third-party nonprofits to help lower the up-front capital.

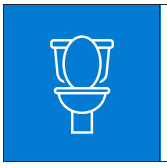
# Water Conservation

Reducing water usage and maximizing water efficiency can potentially result in lower water costs. Reducing water usage may also reduce energy usage and costs, as less energy will be needed to heat and distribute water.

## Water conservation program suggested steps:

- Set short- and long-term water reduction goals
- Track water usage and costs using ENERGY STAR Portfolio Manager month to month, year to year. Compare consumption/cost year-to-year and relative to its peer group.
- For buildings consuming above average water consumption, conduct a comprehensive water audit to identify opportunities to lower overall consumption.
- Install high-efficiency plumbing fixtures and fittings (as defined below) on new installations, retrofits, and replacements.
- Evaluate the soap used in restrooms. Thick soaps will clog drains when water flow is reduced. Foam soaps are often a good solution with low-flow lavatories. Contact the supplier for options.
- Contact vendors to see available water-conserving fixtures and aerators and calculate payback period.
- Utilize available rebates for water saving strategies to improve payback. Check the EPA Rebate Finder for Water Efficiency Products list and the Database for State Incentives for Renewables and Efficiency to see what incentives and rebates for which the property might be eligible.
- Create a plan to improve occupant, employee, and vendor water conservation.
- Communicate high-level water conservation goals, policy changes and major activities to building occupants and ownership during the annual budget process.
- Reuse water that would otherwise be discarded
  - Storm water collected for use on landscaped areas.
  - Grey water for window washing.

*The EPA website provides best practices and analysis tools to help you complete an internal water audit. If you need additional support when considering a water audit, please reach out to Newmark Energy.*



- Buildings built prior to 1992 that have not had new toilets installed are probably flushing 3.5 gallons of water per flush.
- Replacing 3.5 GPF and higher Toilets with new 1.28 GPF toilet can result in paybacks ranging from 2 to 7 years.

## Tracking Consumption

Metering water subsystems provides additional insight into property water usage. Water subsystems usually include irrigation, cooling tower make-up water, cooling tower blowdown water, the boiler make-up, process water, and indoor plumbing fixtures.

To better understand property water usage:

- Consider modifying lease language to require tenants with above-standard consumption to pay for their specific submetered consumption.
- Create and maintain an inventory of all water meters and submeters on the property.
- Install water meters to separate out water use, particularly water that does not flow into the sewer system.
- Some municipalities allow for the deduction of the sewage charge (which is typically more expensive per gallon than potable water) for irrigation and cooling towers.

## Water Efficiency - Plumbing Standards

The below table provides the standard and guidelines for efficient water fixtures and is broken out into 3 categories. Consider installing fixtures that meet the high-efficiency guidelines.

**Epact Post-1992**

EPAct stands for Energy Policy Act and was enacted in 1992. It required a standard flow rates and flush rates for water fixtures for any properties constructed after 1992.

**High-Efficiency**

These fixtures are lower flush and flow rates than the standards enacted by the Energy Policy Act of 1992. Some building codes require high efficiency fixtures.

**Epa Energy Star & Watersense**

These are higher efficiency fixtures that also meets ENERGY STAR and Watersense Specifications.

| FOR COMMERCIAL PRE-RINSE SPRAY VALVES (FOR FOOD SERVICE APPLICATIONS) FOLLOW THE BELOW GUIDELINES: | | |
|---|---|---|
| **PRODUCT CLASS 1** | ≤ 5.0 OZF | 1.0 GPM |
| **PRODUCT CLASS 2** | ≥ 5.0 OZF – ≤8.0 OZF | 1.2 GPM |
| **PRODUCT CLASS 3** | > 8.0 OZF | 1.28 GPM |

**OZF = Ounce Fource*

| FIXTURE | | STANDARD/GUIDELINE | | |
|---|---|---|---|---|
| | | EPACT POST-1992 | EPA ENERGY STAR & WATERSENSE | HIGH-EFFICIENCY* |
| TOILETS | (GPF1) | 1.6 | 1.28 | 1.28 |
| URINALS | (GPF) | 1 | 0.5 | 0.125 |
| PUBLIC LAVATORY | (GPM2) | 2.2 | 0.5 | 0.5 |
| PRIVATE LAVATORY | (GPM) | - | 1.5 | 1.5 |
| KITCHEN FAUCET | (GPM) | 2.2 | - | 2.2 |
| SHOWERHEAD | (GPM) | 2.5 | 1.5-2.0 | ENERGY STAR |
| WASHING MACHINE | (GPL3) | 43 | 10-20 | ENERGY STAR |
| DISHWASHER | (GPL) | 11 | 4-5.8 | ENERGY STAR |

**Some new building codes require fixtures not only to be high-efficiency, but also to meet ASME A112.19.14 or EPA WaterSense Specifications. [1]Gallons per Flush; [2]Gallons per Minute; [3]Gallons per Load*

## Implementing Water-Saving Measures

Installing high-efficiency water fixtures is a great way to potentially reduce property water usage.

## Install Flow Restrictors

- Install aerators on restroom faucets (0.5 GPM)
- The payback period for these modifications is only a few months.
- Install aerators on tenant pantry sinks (1.5 GPM)
- Install flow restrictors to toilets installed before 1993 (≤1.6 gallon per flush)
- Install a dual-flush handle (1.1 & 1.6 GPF) if water closets currently use a flush 1.6 gallons per flush (GPF) (manual flush only)
- Investigate low-cost retrofit kits for urinals that use
- 1.5 or 1.0 gallons per flush (GPF)
- The 1.5 GPF urinal can be taken to 1.0 GPF and, potentially, to 0.5 GPF by installing a flow restrictor.
- The 1.0 GPF urinal can usually be taken to 0.5 GPF. Note: This inexpensive retrofit typically does not work if the urinal is designed to retain a lot of water in the bowl (not the trap) between flushes.
- Replace Commercial Pre-rinse Spray valves (for food service) if they are greater than 3.0 GPM with
- 1.3 GPM valves.
- The payback period for replacing Commercial Pre-Rinse Spray Valves is less than one year.

## Occupancy Sensors

Toilet occupancy sensors are very effective for improving hygiene and is not a water-saving feature.

- Properly calibrate sensors and test sensors to make sure they are at the right height and distance to avoid excessive flushing.

## Dry Fixtures

Switching to Waterless Urinals and Composting Toilets can be very effective for water savings.

- The use of dry/waterless fixtures can often be problematic, particularly in retrofit applications.

## Irrigation

Opportunities to reduce irrigation water waste:

- Optimize irrigation schedule as the weather changes.
- Consider a drip irrigation system.
- Evaluate the installation of Smart Controllers
- Check with the local water authority for resources.
- Southern Nevada Water Authority and EPA WaterSense® are both very helpful websites.
- Converting seasonal color beds to perennial, native and adapted plant materials that conserve water, use less fertilizer and do not require seasonal changes.
- Change out high-pressure heads with rotary heads.
- Ask maintenance to report any leaks or malfunctioning irrigation hardware, such as sprinkler heads.

**Submeter irrigation**

- First, investigate municipal metering requirements to qualify for any available sewage charge deductions.
- For buildings with Building Automation Systems (BAS), obtain a proposal to program BAS to read irrigation submeters and compile interval readings into easy-to-monitor weekly, monthly, and annual summaries.

## Stormwater & Graywater Reuse – On-site Wastewater Treatment

Evaluate solutions to reuse water that would otherwise be discarded.

- Stormwater and graywater can be used for irrigation purposes to reduce potable water consumption.
- Non-potable water from building activities that do not involve human waste or food processing can be filtered and stored in an onsite tank and used for irrigation.

Onsite Wastewater Treatment reduces potable water consumption and wastewater discharge.

- However, stormwater, graywater and wastewater treatment systems often require a more substantial investment and are cost-effective only under certain building site conditions.
- Before systems are installed conduct due diligence and check with state and local offices.

# Waste Management Recycling Program

Each day, Americans on average generate 4.9 lbs. of solid waste per person (U.S. Environmental Protection Agency, 2018). Recycling has become an important eco-sensitive waste management activity, as it:

- Conserves natural resources
- Reduces demand on landfills.
- Reduces toxins released into the air we breathe.
- Reduces waste disposal costs.
- Recycling, and sometimes even composting, is mandated in some states and municipalities.

## Waste Management Program Suggested Steps

- Set short- and long-term goals to reduce waste production over time to reflect the property's commitment to sustainability and to reduce expenses.
- Develop a recycling program to divert as much waste as possible from landfills and incineration.
- Ensure the property is in compliance with any recycling/waste diversion ordinances.
- Track improvements and report waste stream data in ENERGY STAR Portfolio Manager: month to month and year to year.
- Monitor and track the production of hazardous and non-hazardous: recycling, incineration, landfill, composting, reuse, recovery, on-site storage.
- Evaluate the building's current waste diversion rate.
  - Conduct a waste stream audit (Recycling companies, as well as janitorial vendors, may offer this service for free or a small fee)
- Plan to reduce waste production over time to reflect property goals and reduce expenses.
- Identify no cost and low-cost activities for immediate implementation Ask janitorial staff to report when recyclables are improperly sorted or found in the garbage.
  - Communicate with those who are not currently or correctly participating in the recycling program.
  - Make it easy to recycle.
  - Clearly display signage.
  - Label all recycling bins. Include pictures of acceptable materials.
  - Organize and display the collection procedures.
- Implement guidelines for handling of construction waste resulting from renovation or fit-out work.

## Education

The key to a successful recycling program is regular outreach and education—of staff, tenants, suppliers, vendors, and contractors. Provide educational material on:

- Information about what to recycle
  - Consider using local recycling companies to hold educational events to increase occupant awareness of recycling opportunities.
- The importance of recycling
- How and Where to recycle
  - Publicize location of recycling facilities
  - Include information about recycling on the property website, in move-in packets and via other means deemed appropriate by property staff.
- Publicize the success of improvements in property recycling.
- Use images for greatest impact
- Check out the EPA's Facts and Figures about Materials, Waste and Recycling.

## Waste/Recycling Ordinances

Throughout the country, some cities and counties require recycling in multi-family, commercial, and/or industrial buildings in their effort to minimize waste production.

Below are some cities that require recycling ordinance. Recycling ordinances are becoming increasingly common – be sure to check with your local authorities to see if the property is in an area covered by waste/recycling ordinances.

**Austin, TX**

Submit an annual diversion report by February 1st for multi- family and commercial properties greater than or equal to 5,000 SF; noncompliance can result in a $200-$2,000 fine.

**Portland, OR**

All commercial and multi-family properties must report recycling data when requested by the Bureau of Planning and Sustainability; noncompliance can result in a fee of $200 per month and may reach $1,500.

**Fairfax, VA**

Submit an annual online form and complete an annual recycling plan for the city by March 1st for all nonresidential and all multi- family properties; noncompliance can result in a $25 fine.

**San Diego, CA**

Submit an annual online form by August 15th for all majority commercial properties that dispose of at least four cubic yards of waste a week and all majority multi-family properties with 5 or more units; noncompliance can result in a $100-$1,000 fine.

## Consumable Waste

Consumables are defined as paper, glass, plastics, cardboard, old, corrugated cardboard, food waste and metal.

The recycling rates provided by most recycling companies are based on the waste diversion rate of the sorting facility, and not the diversion rate of individual properties.

Suggestions for implementing a successful recycling program:

- Evaluate the building's current waste diversion rate for consumables by conducting a waste stream audit.
- Recycling companies, as well as janitorial vendors, may offer this service for free or a small fee.
- Janitorial service companies are valuable partners in the success of your recycling program. Ask janitorial staff to report when recyclables are improperly sorted or found in the garbage so building management can communicate problems and solutions with tenants.
- Communicate with tenants who are not currently or correctly participating in the building's improved waste management plan.
- To make it as easy as possible for tenants to participate, organize and display the collection procedures.
- Place labels on all recycling bins to clearly identify them. Check with your janitorial company to find out if labels should be in an additional language. Include pictures of acceptable materials.
- Work with your recycling company to increase recycling rates and achieve cost savings.
- Consult with the building's janitorial and recycling providers the implementation of desk-side recycling only and placing trash containers in tenant common areas. Roll out program to tenants.
- Hire a "sorter" or "dumpster-diver" to maximize the diversion rate and decrease waste disposal costs.

## Electronic Waste

Electronic waste includes items such as computers, laptops, monitors, servers and racks, electronics and mobile phones. Implement a building-wide electronic waste program and/or identify reputable vendors to work directly with tenants for recycling.

- Host annual/regular e-waste collection events for the building
- E-waste recycling companies may set up and host these events for free
- Prohibit discarded e-waste in property dumpsters.
- If dumpsters are not lockable, use security or the janitorial vendor to help regulate compliance.
- Inform tenants of options to recycle ink cartridges such as take-back programs and reward programs.
- Provide resources for alternative diversion methods including donating, recycling and take-back programs, and re-using onsite, such as:
- Best Buy, Apple and many electronic retailers will recycle electronic device at all retail locations
- Dell's Reconnect Program in partnership with Goodwill will take any brand of computer and many peripherals to be donated or recycled. Dell will even pay for shipping old Dell computers to back to them.

## Lamps

Practices for the safe collection, storage, and recycling of mercury-containing lamps/bulbs.

- Make the recycling of all lamps available to all building occupants.
- Ensure the property is in compliance with all local and state regulations.
- Seven states have banned lamps containing mercury from landfills, including California, Maine, Massachusetts, Minnesota, New Hampshire, Vermont, and Washington.
- Educating property staff about the safe handling, storage and disposal of compact fluorescent (CFL) bulbs and ensuring there is a process for the safe collection, storage, and recycling of mercury-containing lamps.
- Contacting lighting suppliers about take-back programs for used lamps or finding a reputable recycler.
- Check the Recycling Locator for a drop-off location nearby.

## Batteries

Develop a battery recycling program for all portable dry-cell types of batteries – single-use and/or rechargeable batteries – used in radios, cameras, phones, computers, calculators, and other devices and equipment.

- Educate building occupants on the importance of proper battery disposal.
- Place a secure, clearly labeled container to collect batteries in common areas.
- Once a month, or as often as needed, collect batteries to locations such as BatteriesPlus, which recycles batteries and other small e-waste, or subscribe to a recycle program such as EasyPak™. The EPA offers relevant information regarding the disposal of batteries.

## Durable Goods

Durable goods include office supplies, appliances, and furniture.

- Both Goodwill and the Salvation Army accept used furniture and will pick it up free of charge.
- Inquire with your recycling company about a “swap-shop.”
- Recycling vendors may periodically hold such events at a local recycling center.

## Composting

Composting, also known as Organics Recycling in some places, is the process by which organic material, such as food or yard waste, is turned into nutrient-rich fertilizer.

- Several municipalities, including San Francisco, Seattle, and Boulder have mandatory composting ordinances in place. Ask the waste hauler if they offer composting services.
- If the waste hauler does not provide composting services, search CompostNow.org to find a company that services the area.
- Ask the landscaper if it is possible to compost or recycle yard debris.

## Construction Waste

An enormous amount of waste is generated through construction and renovation.

- Reuse building materials (e.g., doors, hardware, and fixtures) whenever possible.
- To reduce waste, consider the use of carpet tiles and movable wall systems.
- Purchase building materials that are recyclable such as certain types of carpet and ceiling tiles.
  - Inquire about take-back programs such as Armstrong® Ceiling Recycling Program for ceiling tiles.
- Purchase new building materials that contain recycled content.
  - For example, according to the Carpet America Recovery Effort, nearly 5 billion pounds of used carpet end up in landfills every year.
  - There are some carpet reclamation centers across the U.S.
  - Certain vendors that sell carpet may offer take-back programs.
  - Purchasing new building materials such as carpet and ceiling tiles made with recycled content supports the recycling market for these materials.

# Sustainable Purchasing

The use of environmentally sensitive materials reduces the impact on the building occupants, building systems and the natural environment. Sustainable purchasing addresses environmental and social factors as well as the total costs associated with each purchase.

When making purchasing decisions, consider what products are made of, where they come from, how they were made, and method of disposal.

- Select vendors that provide environmental data for new products such as:
- Recycled content, chemical content, disposal program and energy and water use.
- Assemble a Purchasing Guide with guidelines for future purchases.
- This includes but is not limited to office paper and supplies, electronic equipment and appliances, construction and renovation supplies.
- Unify product purchasing and reusing goods where possible.
- Reduces costs and excess waste.
- Minimizes the number of deliveries to the building.
- Educate occupants and vendors.
- Improve the awareness of sustainability goals associated with the purchase of new products.
- Utilize purchasing to improve the indoor air quality (IAQ).
- Select vendors and products that do not contain harmful materials.
- Search sustainable online guides and sites to identify products that satisfy environmental criteria.
- National Association of State Procurement Officials has developed a Green Purchasing Guide.
- Greener Choices search engine by Consumer Reports
- Ecolabel Index – a global directory of ecolabels
- The International Organization for Standards (ISO) established best practice for ecolabeling.
- The Global Ecolabelling Network is a tool that can also be used for identifying and procuring environmentally sustainable products and services.

**PURCHASE PRODUCTS THAT SATISFY THE FOLLOWING ENVIRONMENTAL CRITERIA:**

- Non-toxic, chlorine-free, made from recycled content, or made from rapidly renewable materials, such as bamboo, wool, cotton, agrifiber, linoleum, and cork.
- Reusable or refillable
- Energy efficient
- Consider product disposal
- Readily recyclable or are biodegradable
- Inquire about “take-back” programs at purchase of goods, such as electronics, lamps, carpet, and ceiling tile.
- Buy local—this supports the local economy and reduces transportation impacts.
- Minimal packaging
- Products with environmental labels, including: ECOLOGO, ENERGY STAR, EPEAT, Fair Trade, Forest Stewardship Council (FSC), and GREENGUARD

## Office Supplies

- Set all printers to default to duplex (double-sided) printing.
- Refill ink cartridges at locations such as Office Max.
- Purchase pens with refillable ink cartridges.
- Choose a durable or longer-life product.
- Purchase reusable products over disposable products whenever possible.
- Seek out non-disposable options such as ceramic coffee mugs vs. Styrofoam or paper cups.
- If reusable products are not feasible, attempt to purchase products that are biodegradable, made from recycled content or made from rapidly renewable resources.
- Purchase disposable food and beverage containers and utensils made from vegetable fibers instead of plastic.
- Empty the trash contents without using a plastic liner.
- If feasible, purchase biodegradable trash bags, trash bags made from recycled content or liners less than
- 0.7 mil in thickness.
- Purchase rechargeable batteries.
- Inquire with your supplier about sustainable office supplies.
- If possible, purchase FSC (Forestry Stewardship Council) certified paper

## Electric Powered Equipment

- Buy equipment that is ENERGY STAR-certified for every product category that is available including appliances, electronics, computers, printers, etc.
- Take advantage of take-back programs at companies such as the Apple Trade in Program which will provide customers with credit towards the next purchase or an Apple Gift Card. The devices will be refurbished and reused or recycled.
- Office supply retailers such as Staples will recycle electronics and batteries for free and will sometimes offer store credit to trade in unwanted devices.

## Furniture

- Consider buying second-hand furniture.
- Often is more durable.
- Saves the energy, money and packaging it would take to create a new product.

**THE LEED FOR BUILDING OPERATIONS + MAINTENANCE: EXISTING BUILDINGS REFERENCE GUIDE PROVIDES CRITERIA FOR SUSTAINABLE PURCHASING OF FURNITURE AND OTHER BUILDING PRODUCTS.**

- **Contains at least 10%** post-consumer **and/or 20%** pre-consumer material,
- **Contains at least 70%** material salvaged, refurbished, or reused from offsite or outside the organization,
- **Contains at least 70%** material salvaged from onsite,
- **Bio-based products** that meet the Sustainable Agriculture Network requirements,
- **Cradle to Cradle Certified**, which evaluates the manufacturing process,
- **Contains at least 50%** rapidly renewable material,
- **Contains at least 50%** material harvested and processed or extracted and processed within 500 miles of the property,
- **Contains at least 50%** Forest Stewardship Council (FSC)-certified wood.

# Supply Chain

Working with suppliers, vendors, and contractors that commit to sustainable practices reduces the overall environmental and social impact caused by operations. Applying ESG policies to the supply chain supports sustainable practices and minimizes negative impact.

## Develop Sustainable Purchasing Action Plans

- Identify companies and products that claim environmental and social standards by using online resources.
- Including but not limited to sustainable labels and standards like Fairtrade, Certified B Corp, FSC, ENERGY STAR, ECOLOGO
- Choose vendors that provide healthy food options for occupants.
- Consider minority and female-owned businesses when selecting products.
- Consider implementing a Green Purchasing Program
- The National Association of State Procurement Officials has developed a Green Purchasing Guide as a resource.
- Develop purchasing guidelines for future purchases.
- Including but not limited to office paper, supplies electronic equipment and appliances, construction and renovation supplies.

**SUSTAINABLE PURCHASING RESOURCES**

- Greener Choices search engine by Consumer Reports
- Ecolabel Index is a global directory of ecolabels
- The International Organization for Standards (ISO) established best practice for ecolabeling
- The EPA's Recommendation of Specifications, Standards and Ecolabels for Federal Purchasing is a tool that can also be used for identifying and procuring environmentally sustainable products and services.

## Develop ESG policies as part of the due diligence process for choosing suppliers and contractors

- Include a sustainable practices survey to vendors during vendor vetting.
- Evaluate vendor products and practices on their environmental and social impacts during vendor vetting.
- Assess whether the products vendors use do not contain harmful materials and provide environmental information for products and service practices.
- (i.e. recycled content, chemical content, disposal program, energy use, and water use
- Evaluate vendor labor standards and human rights policy.
- Consider vendor supply chain risks, and evaluate all health & safety standards, labor and working.

- condition standards, child labor policy, and business ethics practices such as compliance with corporate governance policies and business ethics practices such as compliance with corporate governance policies
- Consider minority and female-owned business during the vendor selection process.
- Many vendor practices and decisions are out of your control. Contemplate sustainability risk factors within your vendor practices and supply chains.
- Create an Education and Training Program intended to improve vendor awareness of sustainable decision making and processes for products and services.
- Offer educational and sustainability resources for vendors.
- Survey vendors annually to understand vendor sustainability practices.
- Evaluate vendor practices compared to your Education Program and add to or update the program accordingly.
- Follow the practices of the owner's responsible contractor/vendor/supplier policy.

# Transportation & Location Attributes

The mode of transportation people use to travel between work and home has a significant impact on the level of pollution in our air, water and land. The U.S. Department of Energy reports that transportation is responsible for 33% of carbon dioxide emissions (American Public Transportation Association, 2009a). Nearly 43% of U.S. energy resources are used for transportation (American Public Transportation Association, 2009b).

**UTILIZE THE PROPERTY'S EXISTING COMMUNICATION CHANNELS TO**

- Identify the green location attributes of the property.
- Determine how to build on location attributes, making these more useful and attractive to tenants.
- Promote the property's location attributes to current and prospective tenants as one aspect of a practical green lifestyle.

## Identify Location and Transportation Amenities

Determine sustainable location aspects of the property:

- Provide maps of local walking and bike trails.
- Provide information on any bike sharing programs in the area.
- Find out ratings such as the Walk Score of the property, which rates the walkability of the location from 1 to 100. The only thing needed is the address of the location.
- Publicize a list of local amenities for the building occupants, including restaurants, bars, grocery stores, cinemas, theaters, hardware stores, etc.
- Find local farmers markets - use Local Farm Markets.org and the USDA's National Farmers Market Directory.
- Search for nearby restaurants that use regional, locally grown produce using the Eat Well Guide and the Local Harvest website.

Encourage occupants to become familiar with the alternative transportation options available in your region. For each property, consider the following:

- What public transportation options are within walking distance?
- Encourage tenants to check the Transit option on Google Maps when considering transportation options.
- Publicize links to the websites of local transit and provide informational brochures.
- Are there alternative fuel stations nearby?
- Check the U.S. Department of Energy Alternative Fuels Data Center and notify tenants of the closest locations.
- What types of mass and shared transit and ride services operate in the area surrounding the property?
- Provide tenants with information on public and private shuttles, as well as any car sharing services.

## Facilitate Alternative Transportation

Evaluate the different ways to facilitate alternative transportation:

- Allocate preferred parking for low-emission vehicles.
- Evaluate providing bicycle racks, in safe, well-lit locations.
- Inform tenants about the local laws that apply to bike riders.
- Educate occupants on bicycle safety: Advise them to register their bikes with the National Bike Registry, which bike locks are best and what precautions they should take when biking to their destinations.
- Provide showers and changing rooms for bicycle commuters.
- Make occupants aware of the benefits of using alternative transportation:
  - Physical exercise
  - Reduced stress
  - Saving money
- Provide safety information for pedestrians and drivers.
- Provide information on why pollution is harmful.
- Provide information on how to drive more efficiently.

## Electric Vehicle (EV) Charging Stations

- Evaluate installing Electric Vehicle (EV) Charging Stations at the property. In addition to enhancing the property's desirability in the growing EV market, charging stations are a premium amenity that can attract eco-minded tenants and future-proof the property. There are a variety of companies that offer stations at no upfront or maintenance costs for the building.

## Contact Local Transit Authorities

Contact local or regional transportation authority to educate building occupants about different alternative transportation opportunities, as well as provide information on any incentives that may be offered.

- Request the local transportation authority to provide maps of local public transportation routes and local bike paths for display in common areas.
- Facilitate communication with the local transportation authority to discuss discount programs and incentives.

# Resilience

The impacts of climate change are continuing to impact real estate through both increased natural disasters and regulatory responses to mitigate climate change. These impacts have brought climate risks and resilience to the forefront when evaluating commercial real estate investments. Resilience may be defined as the strategies used to respond to risks, including climate risks. This may include proactive strategies to improve the ability of a property and the management team to mitigate and respond to both natural and human created disasters.

To evaluate and measure climate risks, the Taskforce on Climate-related Financial Disclosures (TCFD) framework has identified the most material risk categories. These climate risks are divided into two main categories:

## Transition Risk

- As a response to climate change impacts, changes to regulations, technology trends, market impacts may result and influence real estate assets. Examples Include:
- NYC LL 97 – Mandates Greenhouse Gas Emissions targets
- Washington DC - Clean Energy Act – Mandates building performance standards
- California AB 802 – Statewide mandate for energy benchmarking

## Physical Risk

This includes both short- and long-term climate events that impact the operation of real estate assets. Examples of these climate events include the intensification of the following disasters:

- Severe weather and floods
- Heat Stress
- Droughts
- Sea-level rise
- Water Stress

## Mitigation Of Risks

## Transition Risk

Transition risks are local legislative changes and include energy and water benchmarking requirements, energy audit mandates and required building emissions and energy limits. To understand the current ordinances that may be impacting your property please to refer to the benchmarking ordinance section of this reference guide.

For more information, please review the Institute for Market Transformation resource.

## Physical Risk

Natural disasters and the damage they bring have been measured by insurance carriers and providers for decades and help owners and managers understand potential risks. With the increased impacts from climate change posing a threat to buildings and infrastructure, third-party groups are providing climate risk analytics and metrics. This includes geo-location scenario analysis of physical climate risks on a future horizon (ie. 2030-2040). These analyses allow owners and third-party managers to better understand the potential physical risks brought by climate change.

## Resilience

The results can be used to identify property level upgrades to mitigate risks most material to the asset. In addition to high-level location-based evaluation for climate risks, third-party groups are providing on-site climate risk evaluations. These evaluations are typically completed by engineering firms or climate risk experts and help identify changes that may mitigate risks associated with changes to the climate.

Below are some resilient strategies that allow a property to absorb disturbances while maintaining its structure and function:

## Envelope

- Regularly inspect roofing to prevent rain, wind, and/or moisture damage.
- Clear roof drains of debris and keep traffic off the roof to avoid membrane damage.
- Maintain the envelope of the building and check for cracks and deterioration.
- Flood proofing exposed areas to limit potential costs and improve business continuity.

## Heating, Cooling, Lighting and Energy

- Install energy efficient lighting that requires less amp- hours to run from a battery in the event of a power outage.
- Back up critical systems with renewable power generator, or a battery backup system.
- Implement redundant systems to allow buildings to function until the compromised system can be replaced or repaired. Redundant systems may reduce efficiency but are necessary to increase resilience.
- Elevate critical mechanical equipment to avoid sea-level rise and flood risks.

## Siting And Landscape

- Design landscapes to account for the natural characteristics of the property by installing native plant species most suited to the climate.
- Increase vegetative covers to provide cooling effects, soil stability, groundwater recharge and maintain humidity in the air in dryer regions.
- Reduce the amount of impervious surface on sites to reduce erosion by slowing down the flow of surface water.
- Implement fire-safe landscaping using fire-resistant plant species.
- Install fire breaks such as walkways, rocks, or open space.

## Water and Waste

- A system for reclaimed water can reduce the amount of water discharged to the sewer system by reusing water on site.
- Sewage backflow preventers restrict the flow from reversing back into the building.

**STORMWATER MANAGEMENT**

- Stormwater runoff can lead to flooding, soil erosion, and pollutants entering the soil and water supply. Incorporate stormwater management strategies to avoid these issues:

### Landscaping And Maintenance

- Prevent runoff by installing plants such as native grasses, trees, and shrubs.

### Redirect Roof Downspouts

- If the buildings gutters are outdated or pouring stormwater onto sidewalks or other paved surfaces,
- it can damage the building but cause runoff problems on the property.
- Redirect the spouts so that the water flows into landscaped areas or drainage pathways to retention/ detention ponds.

### Use retention and detention ponds to give stormwater a place to collect.

- A retention pond always has water in it, while detention ponds typically only hold water during and shortly after rains. Both types assist with flood prevention.
- The property is responsible for managing the pond and making sure it is up to code.
- Native vegetation around the pond is recommended to avoid erosion, sink holes, and wet areas.

## Resilient Cities

As an additional resource, major cities in the across the world have teamed up with the Rockefeller Foundation for the 100 Resilient Cities program. These cities have implemented large scale plans to help mitigate risks associated with natural disasters and social issues to improve the durability of their cities. Assets located in these cities may benefit by coordinating efforts with the municipality to improve resiliency on a community scale.

**ROCKEFELLER FOUNDATION RESILIENT CITIES**

| | | | | |
|---|---|---|---|---|
| – Barcelona | – Lisbon | – New York City | – Seoul | – Singapore |
| – Boston | – Los Angeles | – Paris | – Tokyo | – Sydney |
| – Chicago | – Melbourne | – Rome | – Toronto | – The Hague |
| – Hong Kong | – Milan | – Rotterdam | – Vancouver | |
| – Kyoto | – Montreal | – San Francisco | – Wellington | |

## Emergency Response

As a response to natural disasters, it is important to have an established and practiced emergency response plan to keep occupants safe. This section will provide a high-level outline of emergency preparedness strategies outlined by Building Owners and Managers Association (BOMA). This outline may be used as a supplemental resource with any guides provided by your property management company or third-party experts.

The property's emergency plan should have four core strategies to reduce the impacts of emergency or disaster events.

### Mitigation

Maintain building systems to prevent potential disasters and ensure the property is ready to respond in an emergency event.

- Fire suppression
- Ventilation intake dampers and controls
- Building lock down procedures
- Communication methods with occupants and emergency officials

### Preparedness

Ensure personnel are prepared to handle an emergency or natural disaster.

- All property team personnel complete emergency and disaster response trainings
- Create checklist and procedures to save lives and property.
- Notify tenants of evacuation plans and stock of critical supplies like food and water
- Make sure the property has proactive communication strategies for major events (ie. hurricane, blizzard, heat wave, etc.)

### Response

The ability for the property team to respond safely to emergency events.

- The property team has practiced and is well trained in taking actions that help save lives and prevent further property damage.
- Completing necessary evaluation of building systems and knowing when to turn off utilities to mitigate further damage or risk (i.e. natural gas, electricity, water)
- Communicating with tenants and property team members to correctly evacuate the unsafe areas of the property quickly and safely.

### Recovery

- This will include all actions necessary to return the building to normal operations.
- Work with tenants to confirm all members of the household are accounted for.
- Identify and prioritize all repairs needed to return property to safe and normal operation.
- Engage any third-party vendors needed to complete repairs or evaluate potential concerns.

# Health and Well-Being

Buildings can have an impact on the health and productivity of their occupants. Therefore, buildings are an important component to cultivating a healthy work environment. With salaries and benefits typically accounting for 90% of a company's operating costs, productivity and retention rates are a major concern for any employer. Good indoor air quality, thermal comfort, daylight, and good acoustics all play an important role in creating a healthy workplace.

Research on thermal comfort and proximity to windows have also shown productivity increases. Access to services and amenities such as gyms, bicycle storage and green space help encourage building occupants to engage in healthier lifestyles.

The health and well-being features, practices, and policies of a building also impact the surrounding community in addition to the occupants. Noisy landscaping equipment, light pollution from exterior lighting, runoff containing harsh chemicals, and second-hand smoke can all negatively affect the community members and environment.

**STRATEGIES TO ENCOURAGE AND SUPPORT HEALTH AND WELL-BEING:**

- Utilize the Sustainability Checklist to assess current health and wellbeing practices at the property.
- Identify opportunities for improvement and create short- and long-term goals to improve mental, physical, and social health and wellbeing at the property.
- Consult The Drive Toward Healthier Buildings for benefits, top drivers, healthier building features, obstacles, and key partnerships involving healthier buildings.
- Conduct regular tenant satisfaction surveys to monitor progress.
- Follow all protocols in the property manager's standard operating procedures regarding occupant safety.
- Track progress by recording actions taken to improve health and well-being at the property in each of the following categories.

**COVID-19 RESPONSE**

- In response to the global COVID-19 pandemic, new health and wellbeing certification schemes were introduced in 2020, including WELL's Health-Safety Rating and Fitwel's Viral Response Module, that provide best practices and detailed guidance on how building owners and operators can implement policies and procedures that aim to minimize viral transmission among building occupants.
- From guidance on immediate crisis response to the development of long-term contagious disease
- preparedness plans, these certifications schemes address topics such as sanitation procedures, air and water quality management, emergency preparedness, and enhanced stakeholder communication and collaboration.

# Health and Well-Being Strategies

## Acoustic Comfort

Create an environment that protects hearing and promotes comfort:

- Minimize distractions.
- Reduce the amount of exterior noise that enters the building(s).
- Control indoor noise levels.
- Designate quiet areas throughout the property to provide occupants with relaxation space.
- Encourage vendors to use low-decibel landscaping and cleaning equipment.

## Physical Activity

- Promote physical wellness with property offerings, such as promotional discounts, fliers, and education on the importance of physical wellbeing.
- Provide access to exercise and recreational opportunities.
- Encourage use of stairwells as opposed to elevators through friendly reminders and by enhancing the appearance of stairwells.
- Encourage active modes of transportation, such as biking and walking, by providing amenities such as bike storage and trail maps.
- Provide tenants with lists of local parks and trails to visit.

## Indoor Air Quality

- Promote smoking cessation and/or prevention and implement smoke free policies.
- Develop a green cleaning policy for the common area spaces (for more details refer to the Green Cleaning section).
- Speak with vendors about using low VOC products (see Exterior Cleaning and Maintenance section).
- Employ Integrated Pest Management (IPM) which calls for the most effective, least-risk, least-toxic chemical pesticide (See Pest Control and Wildlife Management section).

## Thermal Comfort

- Educate tenants on what efficient, comfortable indoor temperatures are for the climate.
- Provide thermal comfort at the occupant level by providing personal controls, monitoring individual spaces and using apps such as Comfy. Include nature within both the property and interior spaces.

## Biophilic Design

- Include the presence of plants throughout the common areas of the property.
- Work with a landscaper to incorporate trees and a variety of plants at the property.

## Healthy Eating

- Provide healthy food options in vending machines.
- Encourage cafes, cafeterias, and restaurants to provide healthy food options and food labels with clear nutrition facts.

## Inclusive Design

- Create shared spaces for social interaction, such as outdoor seating and collaborative working spaces.
- Ensure spaces are handicap accessible.

## Lighting and Daylight Controls

- Install lighting sensors that turn off artificial lights when daylight is available.
- Ensure window coverings have properly functioning controls so occupants may increase or decrease daylight exposure as needed.

## Physical and/or Mental Healthcare Access

- Provide a list of nearby wellness centers and hospitals for tenants.

## Social Interaction and Connection

- Host events to encourage social interaction.
- Display artwork in the lobby, leasing office and/or common areas. Incorporate artwork from local schools, display local artists, or rent rotating art.

## Water Quality

- Provide filtered drinking water in common areas.
- Monitor any water quality issues.

## Potential Strategies to Encourage and Support Health and Well-Being

Provide hand-hygiene signage that will be permanently placed in the following areas if provided on site, as applicable to the building or space:

- Bathrooms
- Kitchens and/or kitchenettes
- Hand-hygiene stations

## Location Requirements of Hand Hygiene Stations

Stations must be located in all of the following spaces, as applicable to the building or space:

- Entryways
- All restrooms
- Break areas
- Hand sanitizer on each floor
- Hand-washing provisions
- Soap & Water
- Hand drying method

## Inventory and Product Management

- Managing inventory of hand hygiene supplies (soap, sanitizer, and paper towels) weekly
- Restocking supplies at all hand hygiene stations to meet demand, at a minimum of once daily.
- Provision of a minimum of one of the following hand drying methods at all sinks within the required areas:
- Paper towels
- Hand dryers with HEPA filtration are maintained per the manufacturer's instructions.
- Twice daily cleaning of sinks, faucets, soap dispensers, towel dispensers, counters, door handles, and countertops.
- When providing hand sanitizers, provision of hand sanitizers that meet the following requirements:
- At least 60% ethanol
- No presence of methanol, triclosan, or triclocarban
- Are not on the FDA list*of recalled products.
- Soap provided in designated areas must meet the following requirements:
- Plain, non-antibacterial
- Dispensed in liquid, foam or powder form.

## Minimize Person-To-Person Transmission

Detail qualifying design solutions to minimize person-to-person transmission at areas where building occupants are in close proximity such as:

- Workstations
- Common areas and shared spaces
- Shared kitchens
- Shared bathrooms
- Lobbies and reception areas
- Hallways
- Elevators
- Food outlets

Qualifying design solutions to minimize person to person transmission include but are not limited to:

- Visual markers for maintaining six feet distance.
- Sneeze guards
- Implementing protocols to limit capacity.
- Rearranging layouts to maintain distance between occupants or limit capacity.
- Implementing clear circulation protocols in hallways
- Encouraging use of stairs to limit elevator capacity.
- Implementing qualifying design solutions to minimize surface-to-person transmission at high-touch surfaces.

## Minimize Surface to Person Transmission

Qualifying design solutions for limiting surface to person transmission include but are not limited to:

- Touchless technology
- Removing or rearranging equipment to minimize use.
- Visual markers to indicate high-touch surfaces
- Keeping doors open where possible to limit touch points.

# Health and Well-Being Green Building Certifications

## For Commercial Properties

| CERTIFICATION | OVERVIEW | PHASE |
|---|---|---|
| WELL | – 23 Preconditions across 10 health and well-being Concepts<br>– Properties are also eligible to pursue points within 94 Optimizations.<br>– Requires a documentation period, on-site verification by an assessor, and ongoing monitoring.<br>– For whole buildings and interior tenant spaces during construction, renovation, or operation.<br>– WELL Core is offered to owners of multi-tenant buildings and allows them to pursue only the Preconditions and Optimizations that relate to the building operations that they control.<br>– The certification process is considerably more in depth and expensive than the other rating systems in the market. | – New Construction Interior Space<br>– Fit Outs<br>– Existing Buildings |
| fitwel | – Provides a framework of 63 Strategies across 12 Sections to analyze the health impact of a building and its surrounding area on occupants.<br>– Sections include location, access to outdoor spaces, access to utilize stairwells, indoor environments, and access to healthy food, among others.<br>– Requires a documentation period and review period.<br>– Recertification is required every three years. | – New Construction<br>– Existing Buildings |
| LIVING BUILDING CHALLENGE | – Created by the International Living Future Institute<br>– Comprised of 7 performance areas with a total of 20 Imperatives, including a Health and Happiness performance area with Imperatives of Civilized Environment, Healthy Interior Environment, and Biophilic Environment.<br>– Projects must meet all assigned Imperatives and have proven performance through at least 12 consecutive months of operation. | – New Construction |

| CONTAGIOUS DISEASE PREVENTION CERTIFICATIONS | | |
|---|---|---|
| fitwel Viral Response 2020 | – Provides an annual, third-party certification of policies and practices informed by the latest public health research on mitigating the spread of infectious diseases within buildings.<br>– There are eight minimum requirements out of a total of 21 strategies to ensure health benefits are maximized.<br>– Strategies must first be implemented at the entity or portfolio level and then applied at the asset level, allowing the module to be easily scalable | – Existing Buildings |
| WELL HEALTH-SAFETY RATED 2020 | – Third-party verified rating for all building types focusing on operational policies, maintenance protocols, and emergency plans to address a post COVID-19 environment.<br>– No prerequisites<br>– 15 of 21 features must be met to achieve the rating<br>– Multiple projects can qualify for pricing efficiencies only if there is a single owner and payer that share the same space type. | – New Construction Interior Space<br>– Fit Outs<br>– Existing Buildings |

# Indoor Air Quality Management

The goal of the indoor air quality management program is to prevent the occurrence of indoor air quality (IAQ) problems at the property and to resolve such problems promptly if they do arise. IAQ-related activities should be integrated into existing building operations and procedures. Many IAQ problems can be prevented by educating building staff and occupants about the factors that create such problems. When IAQ problems do arise, they can often be resolved using skills that are readily available in-house.

## Develop an IAQ Management Program

- Create an indoor air quality (IAQ) policy.
- Print all IAQ documents and forms and keep in a binder on-site at the property.
- Establish procedures for responding to IAQ complaints. Record keeping facilitates the recognition of patterns.
- Develop a communication protocol to inform occupants about what they can do to ensure good IAQ in the building.
- Have procedures in place for notifying occupants of activities that could cause temporary IAQ conditions
- Major renovation, remodeling, pest control, HVAC operations disruptions, painting
- In order to stay ahead of potential issues, provide personnel training that informs the property team and tenants alike of strategies to improve IAQ.
- Closely monitor: Water intrusion, Construction and renovation debris, Pest management, Responses from tenants, and Mold Growth

## Tips for Improving IAQ

- Create a no smoking policy.
- Change HVAC system filters regularly.
- Choose low-emitting products with third-party labels such as GREENGUARD and GreenSeal (see Sustainable Purchasing section).
- Implement a green cleaning policy (see section on Green Cleaning).
- Perform activities such as painting, gluing, sanding, and soldering outdoors when possible.
- Open windows when temperature and humidity levels permit.
- Increase ventilation during renovations.
- Place pollutant-absorbing plants such as
- Areca Palm, Rubber Plant, and Peace Lily throughout the building.
- Repair all leaks promptly.
- Place walk off mats at all entrances to the building.
- Do not use synthetic fragrances in air fresheners, cleaning products, etc.
- Consider installing a carbon monoxide alarm.

# Green Cleaning

The intent is to maximize cleaning effectiveness and minimize adverse impacts to air quality, human health, building finishes and systems, and the environment.

- Establish standard operating procedures (SOPs)
- Address how an effective cleaning and hard floor and carpet maintenance system will be consistently utilized, managed and audited.
- Purchase sustainable cleaning products meeting the environmental criteria outlined in the following pages.
- Meet the criteria outlined in the following pages for equipment maintenance and repair.
- Develop communications to promote and improve hand hygiene including:
- Hand washing
- Use of alcohol-based waterless hand sanitizers.
- Develop guidelines to address the safe handling and storage of cleaning chemicals used in the building.
- Develop a plan for managing hazardous spills or mishandling incidents.
- Develop requirements for staffing and training of janitorial personnel appropriate to the needs of the building.
- Specifically address the training of janitorial personnel in the use, disposal and recycling of cleaning chemicals, dispensing equipment and packaging.
- Make provisions for continuous improvement.
- Evaluate new technologies, procedures and processes.
- Ensure entryway systems and maintenance reduce the amount of dirt, dust, pollen and other particles entering the building.

# Environmental Criteria: Cleaning Materials and Products

## Hand Soaps

Purchase hand soaps that meet one or more of the following standards:

- No antimicrobial agents (other than as a preservative) except where required by health codes and other regulations (e.g., food service and health care requirements)
- Green Seal GS-41, for industrial and institutional hand cleaners
- Environmental Choice CCD-104 (Ecologo 2784), for hand cleaners and hand soaps
- Environmental Choice CCD-170 (Ecologo 2783), for hand sanitizers
- EPA Safer Choice Standard

## Liners And Disposable Janitorial Paper Products

Purchase disposable janitorial paper products and trash bags that meet the minimum requirements of one or more of the following programs for the applicable product category:

- U.S. EPA Comprehensive Procurement Guidelines, for janitorial paper and plastic trash can liners.
- Liners less than 0.70 mil in thickness.
- California integrated waste management requirements, for plastic trash can liners (California Code of Regulations Title 14, Chapter 4, Article 5, or SABRC 42290-42297 Recycled Content Trash Bag Program).
- Contain at least 10% post-consumer recycled waste.
- Green Seal GS-09, for paper towels and napkins
- Environmental Choice CCD-082 (Ecologo 175), for toilet tissue
- Environmental Choice CCD-086 (Ecologo 175), for hand towels
- Janitorial paper products derived from rapidly renewable resources or made from treefree fibers.
- Forest Stewardship Council (FSC) certification for fiber procurement

## Hard Floor and Carpet Care Products

Purchase cleaning products that meet one or more of the following environmental standards for the appropriate category:

- Green Seal GS-37, for general-purpose, bathroom, glass and carpet cleaners used for industrial and institutional purposes.
- Environmental Choice CCD-110 (Ecologo 2792), for cleaning and degreasing compounds.
- Environmental Choice CCD-146 (Ecologo 2759), for hard surface cleaners
- Environmental Choice CCD-148 (Ecologo 2795), for carpet and upholstery care
- Green Seal GS-40, for industrial and institutional floor care products
- Environmental Choice CCD-112 (Ecologo 2798), for biological digestion additives for cleaning and odor control
- Environmental Choice CCD-113 (Ecologo 2791), for drain and grease trap additives.
- Environmental Choice CCD-115 (Ecologo 2796), for odor control additives
- Environmental Choice CCD-147 (Ecologo 2777), for hard floor care
- California Code of Regulations maximum allowable VOC levels for specific consumer products

## Equipment Purchases

Criteria for new cleaning equipment that will be used on the property:

- Vacuum cleaners certified by the Carpet and Rug Institute “Green Label” Testing Program for vacuum cleaners and operate with a sound level of less than 70dBA.
- Carpet extraction equipment used for restorative deep cleaning certified by the Carpet and Rug Institute’s “Seal of Approval” Testing Program for deep–cleaning extractors and “Seal of Approval” Deep Cleaning Systems program.
- Powered floor maintenance equipment, including electric and battery- powered floor buffers and burnishers, equipped with vacuums, guards and/or other devices for capturing fine particulates and which operate with a sound of less than 70dBA.
- Propane-powered floor equipment having high-efficiency, low-emissions engines with catalytic converters and mufflers that meet the California Air Resources.
- Board (CARB) or Environmental Protection Agency (EPA) standards for the specific engine size and operate with a sound level of less than 90dBA.
- Automated scrubbing machines equipped with variable- speed feed pumps and have either (1) on-board chemical metering to optimize the use of cleaning fluids or (2) dilution control systems for chemical refilling. Alternatively, scrubbing machines that use only tap water with no added cleaning products.
- Battery-powered equipment equipped with environmentally preferable gel batteries.
- Powered equipment that is ergonomically designed to minimize vibration, noise and user fatigue.

## Equipment Maintenance

Equipment used in cleaning has significant environmental and/or health impacts— to the building's indoor air quality and building finishes. Implement the following practices:

- Log of all janitorial equipment used at the facility.
- Identification of each piece of powered cleaning equipment in use, including Equipment Type, Model Number and Manufacturer. Equipment includes, but may not be limited to, vacuum cleaners, carpet extraction equipment, powered floor maintenance equipment, propane-powered floor equipment, automated scrubbing machines and battery-powered equipment.
- The date of equipment purchase.
- The applicable sustainability criterion met by each equipment item.
- The specification sheets on the equipment show compliance with the sustainability criteria.
- Routinely maintain all equipment to optimize performance.
- Maintain a log of all maintenance and repair.
- The log can identify the date of maintenance, type of maintenance, date of repair and type of repair for each piece of equipment.

## Chemical Handling and Storage

Proper isolation, storage and handling of chemicals will reduce the risk of occupant and worker exposure to potentially hazardous materials. Incorporate the strategies listed below into the chemical handling and storage procedures:

- Log all housekeeping chemicals used or stored on the premises.
- Maintained by building management and vendors.
- Stored products include those that are no longer used, but still in the building.
- Attachments to the log shall include manufacturer's Material Safety Data Sheets and Technical Bulletins.
- Store chemicals in isolated areas of the building.
- Proper isolation includes locked doorways with access for authorized janitorial staff and building staff.
- Identify areas on building floor plans.
- Containers are properly labeled and easily identifiable.
- Chemical dilution system guidelines are followed.
- Cleaning products are properly and safely stored and are not placed on shelves above eye level.
- Custodians wear appropriate personal protective equipment.
- Closed dilution systems use concentrates (preferred).

## Use of Concentrates from Dispensing Equipment

**Use of chemical concentrates has several positive environmental benefits.**

- Significantly lower transportation costs between manufacturer and end-user.
- Significantly less use of packaging materials.
- Lower real chemical use to obtain same performance.
- Potentially lower exposure of janitorial personnel to hazardous chemicals

**Chemical concentrates may present greater hazards upon exposure.**

- Proper containment, storage, and dispensing of chemical concentrates is critical in avoiding employee exposure.
- Exposure to hazardous chemicals is minimized by using closed dispensing systems.
- Concentrates sold for manual dilution in buckets or bottles can increase the risk of employee exposure.
- Personnel must be properly trained (and retrained) in the use, maintenance and disposal of housekeeping chemicals, dispensing equipment, and packaging.

## Entryway Systems

Entryway systems at building entries reduce the amount of contaminants and particulate matter tracked into the building, reduces the risk of slip and fall accidents, and protects the building flooring systems from excessive wear and tear.

- Install walk-off mats, grills and/or grates immediately inside each entrance.
- Preferably, mats are at least 10 feet as measured along the primary direction of travel.
- The types of mats and maintenance of the mats shall be dictated by seasonal conditions and traffic.

## Working With Vendors

- Select property vendors that stay abreast of new environmentally friendly products, equipment, processes and share such knowledge with Property Management.
- Require property vendors to minimize waste and to recycle wherever possible and facilitate Property Management and building occupants in their recycling efforts.

## Education And Training

Train custodians in green cleaning including the janitorial company's green cleaning process for achieving the requirements contained herein.

# Tenant Engagement

Collaboration with building occupants is essential to successfully implement a sustainability program and ensure customer satisfaction.

## Educate

- Educate occupants on how to conserve energy and water and reduce waste:
- Simple behavioral changes they can make to reduce energy such as switching off lights and unplugging appliances when not in use.
- Report any leaks and malfunctioning restroom or irrigation equipment.
- Demonstrate the proper use of equipment such as thermostats and dual-flush toilets.
- Contact your local or regional transportation authority to help educate building occupants.
- Alternative transportation opportunities
- Information on any incentives that may be offered.
- Recycling companies may provide training sessions

## Host Events

- Host events focused on increasing the awareness of sustainability opportunities.
- E-Waste and Furniture Recycling events
- See Waste Management – Recycling Programs section.
- Household goods and clothing collection drives hosted by local non-profit organizations.

## Communicate

- Publicize any updated sustainability goals, guides, and recommendations. Make available via company website, bulletin board, or newsletter.
- Keep occupants informed via the about any property upgrades and how much energy and water is being saved.
- Inform occupants of the current property waste tonnage, recycling rates and future goals of the property.
- Encourage feedback and suggestions regarding occupant satisfaction with the property (cleanliness, thermal comfort, etc.)
- Evaluate the installation of a water bottle refilling station in common area(s) such as the lobby or other common spaces. Retrofit kits are available for existing water fountains, such as those by Elkay.
- Evaluate the installation of Electric Vehicle Charging Stations. Installing EVSE may attract and retain employees and foster a green and environmentally sustainable community.
- Provide updates on energy and water consumption and waste/recycling efforts.
- Prominently display and promote any building certifications, such as ENERGY STAR or LEED.

# Community Engagement

## By engaging the local surrounding community where the building is located, tenants can help support the growth and development of the communities in which we live and work.

### Create opportunities for communication.

- Create a newsletter that highlights what occupants are doing for the environment and the local community and/or communicate through social media channels.

### Establish an area where tenants and community members can communicate with each other.

- Interact with the local community through a variety of written, electronic, and social media channels.
- Inform occupants about activities and events occurring in the local community.
- Establish, host, and promote property-wide community service events and activities.
- Tree planting
- Set up various drives (blood, food, toys, etc.)
- Earth Day events

### Engage with the local community to participate in building events.

- Invite local businesses to showcase their products and services.
- Invite local musicians to play at the property for social events.
- Have local restaurants provide food sampling in common areas.
- Support charities and local community groups. Invite local charities to come to the building to speak with tenants.
- Create social and networking opportunities.
- Provide financial, social, or other assistance in case of disaster.
- Host a collection drive for natural disasters.
- Create enhancement programs for public spaces (green space, displaying artwork, etc.)

# Refrigerant Management

Under the Montreal Protocol (1987), refrigerants containing chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) are being aggressively phased out due to their Ozone Depletion (ODP) and Global Warming Potential (GWP).

## Refrigerant Management Program Steps

**Create a Refrigerant Management Program:**

- Meeting and/or exceeding standards set by the U.S. Environmental Protection Agency (EPA).
- Section 608 of the Clean Air Act is in place covering the property's air conditioning and refrigeration equipment and stored refrigerants.

**Ensure a refrigerant inventory is on file:**

- Up to date with equipment nameplate information, location of equipment, area served, refrigerant charge/capacity.
- Maintain all service and maintenance records.
- Proper record keeping for refrigerant loss/charge is a federal regulation.

**Evaluate refrigerant reclaiming and recycling options.**

**Seek economically viable refrigerant alternatives that minimize environmental impact.**

- Refrigerants containing hydrofluorocarbons (HFCs) or natural refrigerants.
- Be aware of the risks associated with chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs).

Buildings built in 1995 or before may contain fire suppression systems that use halons and/or HVAC equipment using chlorofluorocarbons (CFCs) such as R- 11, R-12, R-114. If this is the case, evaluate the economic feasibility and environmental risk associated with this equipment and present it annually to the Asset Manager in advance of the property's annual budgeting process.

- HCFC-22 (A.K.A. R-22), a commonly used refrigerant, can no longer be manufactured in or imported into the U.S.
- Be aware of manufacturers continue to sell systems using R-22.
- R-22 is planned for complete phase-out by 2030.
- By 2020, R-22 will be illegal to produce, and the servicing of the HVAC systems will rely on recycled or stockpiled quantities.
- Ensure capital plan includes replace system which utilizes R-410a or similar HFC replacements.

# Landscaping

Choice of landscape materials and practices impacts the sites Water consumption and Water and air pollution resulting from runoff of harmful chemicals Newmark will work with service providers, vendors, and maintenance staff to ensure the following policies and procedures are considered.

## Equipment Utilized

- Utilize equipment that reduces noise and pollution.
- Review EPA regulations for all new purchases of small spark-ignition engines, to reduce emissions.
- Consider alternative work methods to abate environmental impacts, where feasible (e.g., hand-raking leaves and manual sweeping)
- When designing landscaped areas, minimizes use of motorized equipment (e.g., replacing turf with ground covers and hardscaping).

## Selecting Plant Materials

- Do not install invasive species.
- Convert seasonal color beds to perennial, native and plant materials that conserve water, use less fertilizer and do not require seasonal changes.
- Install native plant materials most appropriate to the climate and region.
- Avoid plants requiring large amounts of water and/or fertilizer.

## Handling of Debris and Waste

- Compost landscape debris from the property.
- Debris can be reused as mulch or compost.
- Recycle all steel products at end of lifecycle.
- Store and dispose of all petroleum products and chemicals in the most environmentally friendly way possible as recommended by the Environmental Protection Agency (EPA).

## Fertilizer Use

- Use organic and natural materials.
- Use natural fertilizers where possible; Reduce reliance on chemicals.
- If synthetic fertilizers are used, choose slow-release formulations,
- Do not use “weed and feed” products.
- Use fertilizers based on need determined by soil testing and other indicators.
- Keep fertilizer at least 25 feet away from any water features.
- Use fertilizers only during times of plant uptake and not when heavy rain is expected.

## Irrigation Systems, Controls, And Maintenance

- Adjust for the landscape’s seasonal requirements.
- Regularly calibrate the irrigation system.
- Make minor adjustments such as flow control, radius adjustment, nozzle cleaning, sprinkler height and level adjustment.
- Install rain sensors.
- Use moisture sensors in irrigated pots.
- Evaluate the installation of Smart Controllers
- Check with the local water authority for resources; The EPA WaterSense® is a very helpful website.
- Change high-pressure heads with rotary heads.
- Perform regular maintenance to any malfunction, damage, or inefficiencies of the system.

## Site and Erosion Control

To minimize erosion and runoff, incorporate site management practices, including:

- Periodic checks and clearing of roof drains, gutters, downspouts, drainage ditches and other drainage infrastructure.
- Periodic checks for loose soil on slopes, particularly during wet periods
- Checks for standing water or other evidence of poor drainage after rain events.
- Maintenance of ground cover
- Cleanup of major sedimentation sources, such as plant debris on paved surfaces
- Should any erosion or sedimentation problems arise, promptly assess the area and develop a plan to resolve the problem.
- Appropriate to any construction activity occurring on the site, utilize the following erosion and sedimentation control measures:
- All landscape and site maintenance, new construction activities and infrastructure repair shall prevent soil erosion.
- If soil does become eroded, measures shall be taken to address the eroded area.
- Should restoration of eroded soil areas be needed, the following measures can be considered: native and xeric plantings and grasses, temporary seeding, permanent seeding, mulching, earth dikes, silt fences, sediment traps and sediment basins.
- If construction activity occurs on the site, all topsoil shall be stockpiled and covered for reuse to prevent storm water runoff and/or wind erosion. If wind conditions are severe during construction, topsoil shall be watered down and covered.

*Develop a Site & Erosion Control Plan to be a part of any construction activity affecting the site and shall conform to either "Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites," Environmental Protection Agency, Publication No. EPA 833-R- 060-04, (September 2007), or local erosion and sedimentation control standards and codes, whichever is more stringent.*

# Pest Control

Pests can be defined as plants, fungi, insects, or animals. Any product kills living things, such as pesticides, has a reasonable chance of not being healthy for humans and other organisms that are not the target of the pest control.

**INTEGRATED PEST MANAGEMENT (IPM) IS AN EFFECTIVE AND ENVIRONMENTALLY SENSITIVE APPROACH TO PEST MANAGEMENT**

- It relies on a combination of common-sense practices to reduce sources of food, water and shelter for pests in buildings and on the grounds
- It minimizes the use of pesticides, helping prevent pollution of surrounding area with harmful chemicals and support biodiversity and habitat retention
- IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment.
- It means to manage pest damage by the most economical means and with the least possible hazard to people, property, and the environment.

Work with property vendors and maintenance staff to encourage the activities below, including incorporating these suggestions in the respective vendor contracts.

## Integrated Pest Management (IPM)

- Choose vendors that incorporate the use of Integrated Pest Management (IPM) practices.
- IPM calls for the most effective, least-risk, least-toxic chemical pesticide.
- Use integrated methods to monitor and manage pests through nontoxic and least toxic methods.
- Schedule regular pest inspections that include checking “hot spots” and pest population tracking
- Use non-chemical methods whenever possible.
- Use least-toxic chemical pesticides and only in targeted locations and only for targeted species.
- Use alternatives to artificial chemicals.
- Carefully and strategically place traps for both rodents and insects throughout the property and monitor for early signs of a pest problem.
- Only use rodent baits if there is a problem.
- Maintain exterior envelope to deter pests around perimeter of building.
- Seal exterior cracks and crevasses in building
- Manage pest attractants (e.g., trash receptacles)
- Train personnel and educate occupants.
- Implement routine inspections, monitoring and record keeping of all chemicals and procedures used to mitigate or prevent pests at the property.

# Biodiversity & Wildlife Management

Humane and effective solutions available can safely handle any wildlife issues within urban areas.

- Utilize the knowledge and services of wildlife organizations and companies dedicated can prevent native animals from being orphaned, injured, unsafely relocated or euthanized.
- Remove all potential food sources and water availability on the property as a means of prevention.
- This includes fallen fruit from trees, trash scraps, and trash containers animals can easily push over or open.
- Secure all areas wild animals could potentially take shelter.
- Including under buildings or in open spaces beneath structures, with tightly screened galvanized hardware mesh.

## Beekeeping

A rising new trend in the real estate sustainability industry is urban beekeeping!

- Encourages healthy bee populations, which pollinate nearby crops and gardens, supporting local food production and biodiversity.
- Honey produced from urban beekeeping typically contains less chemical residue than commercially produced honey due to pesticides used in commercial agriculture. Beehive installations can produce up to 60 pounds of honey a year!
- Some evidence suggests consuming local honey helps develop immunity to local allergens.

**HOW TO BEEKEEP**

- Ensure it is legal to have an urban beehive in your city, check with your local beekeeping association.
- Select an easily accessible space outdoors with 6 feet of space on all sides with a sufficient water source near by
- Ensure the hive location is approved by the appropriate entities, such as the Department of Health
- Have the third-party install the hives in the spring.
- There are companies that specialize in urban beekeeping installation, upkeep, and education who will work with the property

*Beekeeping is helpful in maintaining green roofs and in attaining green building certifications, such as LEED, where beekeeping is considered as a part of the environmental sustainability of a building.*

# Exterior Cleaning & Maintenance

Chemicals in cleaning compounds, snow and ice removal products as well as gasoline, oil and antifreeze all wash off hard surfaces and into stormwater runoff. This runoff flows into nearby lakes and streams and is harmful to fish and other aquatic life, as well as pollutes the water we drink.

The use of conventional mowers and blowers is a significant source of emissions and noise pollution and can cause hearing loss (according to the U.S. Department of Health & Human Services, exposure to sounds above 85 decibels can cause hearing loss). Encourage respective vendors and maintenance staff to implement the below procedures and consider incorporating practices into vendor contracts.

## Equipment Use

- Seek to use equipment that minimizes noise pollution (low-decibel blowers) and reduces emissions (electric, propane or high-efficiency power equipment)
- To prevent further pollution, ensure equipment is meeting claims of low emissions by seeking out the newest technology complying with EPA and California Air Resources Board (CARB) standards.
- To view lawn equipment that is known to be manufacturer-rated at 65 decibels or below, the City of Burlingame, California has compiled a list.

## Snow And Ice Removal

- Use non-toxic and least-toxic products to minimize harm to local aquatic ecosystems.
- Avoid the use of snow and ice removal agents that are toxic, such as calcium chloride and sodium chloride.
- Test non-toxic and least-toxic products to determine the best products and appropriate applications.
- Staff and vendors can continually seek to minimize the environmental harm of the products used.

## Cleaning of Building Exterior and Grounds

- Review building exterior cleaning practices.
- Clean as necessary and in accordance with prudent management and maintenance practices and with environmentally friendly cleaning agents.
- Environmental standards for cleaning agents used on building exteriors:
- Biodegradable
- No antimicrobial agents or phosphates
- Use only cleaning agents that meet the Green Seal® or ECOLOGO standards such as GS-37 and CCD-110 (Ecologo 2792) or 146 (Ecologo 2759).
- Use cleaning practices that efficiently use of water and ensure chemicals do not run into the sewer system.

## Vendor Suggestions

- Ask vendor/service provider about low-decibel equipment and non or least- toxic products available.
- Ask vendors to stay abreast of new, environmentally friendly products and equipment and share such knowledge with the building management.
- Consider incorporating environmentally sustainable criteria for equipment and cleaning products in vendor contracts.
- Advise vendors to minimize waste and to recycle whenever possible.

## Low-VOC Products On Building Exterior And Site

Use low-VOC paints, coatings, primers, adhesives, sealants, sealant primers, coatings, stains, finishes and the like whenever possible.

# Roofs and Hardscapes

The materials used for roofs and hardscape areas can affect surrounding outdoor temperatures as well as the cooling load within a building.

- Urban areas of large cities can be up to 8° hotter than surrounding undeveloped areas due to dark-colored roofs and asphalt roads, which absorb heat. Scientists at Lawrence Berkeley National Laboratory labeled this the Urban Heat Island effect.
- Using cooler materials can effectively reflect the sun's energy from the roof or hardscape surface.
- See the Department of Energy's Guidelines for Selecting Cool Roofs, which includes selecting the right roofing material and coating, cost premiums and payback analysis tools. Investigate local building codes and incentives.

## Strategies to reduce the property's energy bills and the urban heat island effect:

- Evaluate the installation of white or cool roofs.
  - They can be 50° to 60° F cooler on than dark-colored roofs, which absorb 70% or more of the sun's heat which can result in peak roof temperatures of 150° to 190° F
- Energy savings are more likely to be highest for low-rise buildings with rooftop HVAC units.
- Savings are also much higher for settings with less insulation.
- Cool roofs cut energy use during peak demand times during the summer when rates are highest, having more impact on energy costs than energy use.
- Longer life for materials and equipment results in less waste in landfills.
- Improve indoor occupant comfort in the summer due to less absorbed heat.
- Consider the feasibility of replacing non-reflective hard surfaces.
  - Examine hard surfaces like sidewalks and parking lots.
  - Concrete, as compared to asphalt usually has a somewhat higher first cost, but the lifecycle costs of concrete are typically significantly lower due to its superior durability and strength.

## Green roofs

Green roofs require high-quality waterproofing, root repellant systems, drainage systems, a lightweight growing medium, and plants.

- These roofs have potential to save energy through their insulating qualities.
- Tend to have twice the usable life of traditional roofs.
- Can improve energy performance of buildings.
- Help manage stormwater.
- Reduce airborne emissions.
- Ease the urban heat island effect.

## Determining Options

To reduce the urban heat island effect and improve the buildings' energy efficiency, opportunities exist at repair/replacement when selecting: types of roofs, roofing materials, coatings, radiant barriers, trees and plants to shade the buildings, and types of hard surface materials for sidewalks and parking lots.

- Check with the city's building department.
  - Many offer rebates or incentives for the installation of cool roofs as a cost effective and low-risk approach to reducing cooling loads and peak demand.
  - The American Council for an Energy-Efficient Economy offers a list of cities with programs, goals, or incentives related to urban heat islands.
- Consider the slope of the roof to determine the best product application.
- To assess a roofing or hardscape product, look for information about its Solar Reflective Index (SRI) value.
  - The Solar Reflective Index is a measure of ability to reflect solar heat.
  - It is defined so that standard black is 0 and standard white is 100.
  - SRI combines reflectance and emittance values into one number, so that materials with the highest SRI values are the coolest choices.

| SRI FOR PAVING MATERIALS - HIGHER VALUES REPRESENT THE COOLEST CHOICES | |
|---|---|
| MATERIAL | SRI |
| NEW ASPHALT | 0 |
| WEATHERED ASPHALT | 6 |
| NEW GRAY CONCRETE | 35 |
| WEATHERED CONCRETE | 19 |
| NEW WHITE PORTLAND CEMENT CONCRETE | 86 |
| WEATHERED WHITE PORTLAND CEMENT CONCRETE | 45 |

| LEED GREEN BUILDING RATING SYSTEM RECOMMENDS THE BELOW SRIs FOR ROOFING MATERIALS BASED ON ROOF SLOPE | | |
|---|---|---|
| ROOF TYPE | SLOPE | SRI |
| LOW-SLOPED ROOF | < 2:12 | 78 |
| STEEP-SLOPED ROOF | > 2:12 | 29 |

# Light Pollution

Excessive and poorly directed outdoor lighting, often referred to as Light Pollution, has negative impacts including:

- Wasted energy and money.
- Obscured views of the stars in the nighttime sky for nearby residents
- Increased glare which reduces visibility and comfort
- Disruption of local nocturnal ecosystems
- Lighting trespass, which refers to unwanted light entering neighboring properties.

## Reduction Strategies

- All non-essential lighting within buildings should turn off automatically following operating hours.
- Evaluate the use of timers or other controls to extinguish lighting when not needed.
- Encourage the all building personnel to turn off lights in buildings without automated controls
- Seek to have very little light shining through openings in the buildings' envelope at night.
- Exterior lighting is recommended to be shielded so that light is focused downward.

## Light Pollution Laws

- At least 18 states, the District of Columbia and Puerto Rico have laws in place to reduce light pollution.
- Most states that have enacted "dark skies" legislation have done so to promote energy conservation, public safety, aesthetic interests and astronomical research capabilities.
- Dark skies legislation requires the installation of shielded light fixtures which emit light only downward
- Municipalities in several states have adopted light pollution regulations as part of their zoning codes
- Most state laws are limited to outdoor lighting fixtures installed on the grounds of a state facilities or roadways

## Other laws

- Require the use of low-glare or low-wattage lighting
- Regulate the amount of time that certain lighting can be used
- The incorporation of Illuminating Engineering Society (IES) guidelines into state regulations.

ABOUT NEWMARK

# We transform untapped potential into limitless opportunity.

**At Newmark, we don't just adapt to what our partners need—we adapt to what the future demands.**

Since 1929, we've faced forward, predicting change and pioneering ideas. Almost a century later, the same strategic sense and audacious thinking still guide our approach. Today our integrated platform delivers seamlessly connected services tailored to every type of client, from owners to occupiers, investors to founders, and growing startups to leading companies.

**Tapping into smart tech and smarter people, Newmark brings ingenuity to every exchange and transparency to every relationship.**

We think outside of boxes, buildings and business lines, delivering a global perspective and a nimble approach. From reimagining spaces to engineering solutions, we have the vision to see what's next and the tenacity to get there first.

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*For more information:*

**Craig W. Flinn, LEED AP**
**Executive Managing Director**
**Energy and Sustainability Solutions**
**Craig.Flinn@nmrk.com**

**New York Headquarters**
125 Park Ave.
New York, NY 10017
t 212-372-2000

**nmrk.com**

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