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2025

Energy and Sustainability Services Guide

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Energy & Sustainability Services (ESS) Guide

Introduction

This guide, developed by Newmark's Energy and Sustainability Services (ESS) team, is designed to help property teams reduce the environmental and social impacts of operations, maintenance, and construction while improving building performance and compliance. It offers practical actions, tools, and references that can be tailored to each asset.

Many of the practices and recommendations in this guide:

–   Can be implemented at low to no incremental cost.

–   Lead to ongoing energy, water, and waste savings.

–   Serve as a reference for setting and tracking sustainability goals.

–   Support conversations with vendors, service partners, and tenants.

–   Provide concise education on trends, environmental labels, standard products, practices, and audits.

–   Help prepare properties for green building certifications.

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

This reference is a living document authored and maintained by Newmark's ESS team; it is intended as guidance and may need to be adapted for the building tenancy, ownership strategy, and location.
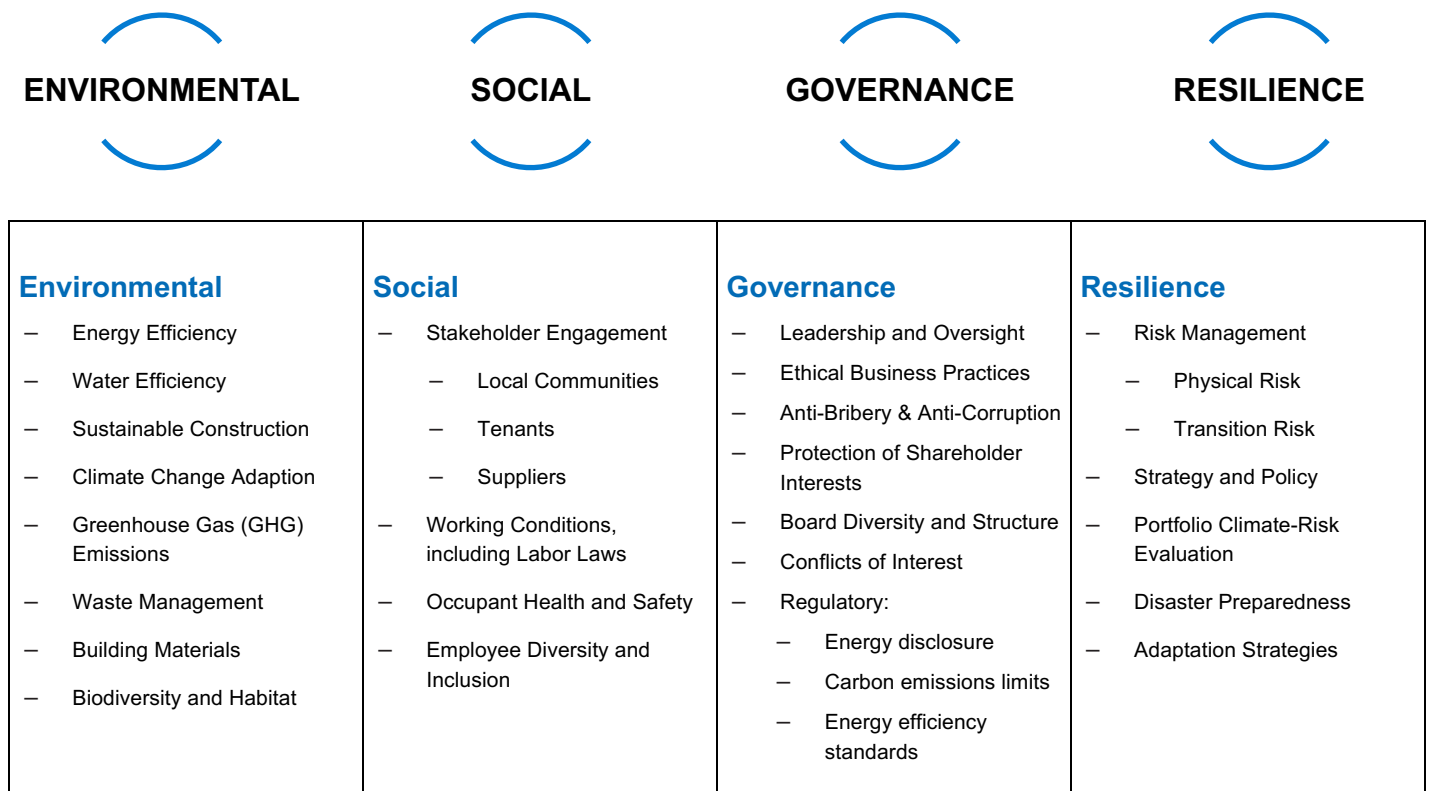
Note: The Newmark ESS Guide is updated annually. Please refer to the most current release.

What is ESG+R

Initiatives formerly recognized as "Green" and "Sustainable" have now broadened their scope to encompass Environmental, Social, Governance, and Resilience (ESG+R) factors.

There is a growing emphasis from both consumers and investors on how companies incorporate ESG+R considerations across their entire organizations. This involves examining a company's management of natural resources and efforts to minimize pollution, evaluating their treatment of employees and engagement with local communities, and assessing the compliance of their executive team with regulations while reporting to both local and global initiatives, among other factors.

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

ENVIRONMENTAL	SOCIAL	GOVERNANCE	RESILIENCE

Environmental	Social	Governance	Resilience
— Energy Efficiency	— Stakeholder Engagement	— Leadership and Oversight	— Risk Management
— Water Efficiency	— Local Communities	— Ethical Business Practices	— Physical Risk
— Sustainable Construction	— Tenants	— Anti-Bribery & Anti-Corruption	— Transition Risk
— Climate Change Adaption	— Suppliers	— Protection of Shareholder Interests	— Strategy and Policy
— Greenhouse Gas (GHG) Emissions	— Working Conditions, including Labor Laws	— Board Diversity and Structure	— Portfolio Climate-Risk Evaluation
— Waste Management	— Occupant Health and Safety	— Conflicts of Interest	— Disaster Preparedness
— Building Materials	— Employee Diversity and Inclusion	— Regulatory:	— Adaptation Strategies
— Biodiversity and Habitat		— Energy disclosure	
		— Carbon emissions limits	
		— Energy efficiency standards	

We are entering an era marked by a surge in environmental regulations, a rising wave of tenant preferences for sustainable buildings, and heightened investor insistence on robust ESG+R programs and transparent reporting. To navigate this changing landscape, real estate entities must demonstrate a commitment to long-term sustainability and resilience in order to meet requirements and enhance their overall market position.

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Climate change refers to a persistent, long-term alteration in Earth's climate, encompassing shifts in temperature, precipitation patterns, and other climatic elements, resulting from both natural processes and human activities.

The greatest factor contributing to climate change is the increased concentration of greenhouse gases in the Earth's atmosphere. The burning of fossil fuels, such as coal, oil, and natural gas, for energy is a major source of carbon dioxide emissions, along with deforestation and changes in land use. In addition to carbon dioxide, other greenhouse gases such as methane, nitrous oxide, water vapor, and ozone also raise the Earth's average surface temperature by trapping heat, a process commonly referred to as global warming.

Buildings have a direct relationship with the amount of greenhouse gases emitted into 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 sectors are responsible for 39% of global carbon emissions, with operational emissions (from energy used to heat, cool and light buildings) accounting for 28%. In order to meet the objectives of the 2015 Paris Agreement, which aims to limit global warming to well below 2°C above pre-industrial levels, the energy intensity of the buildings sectors must improve by an average of 30% by 2030.

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.

Green 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 assess the following main elements:

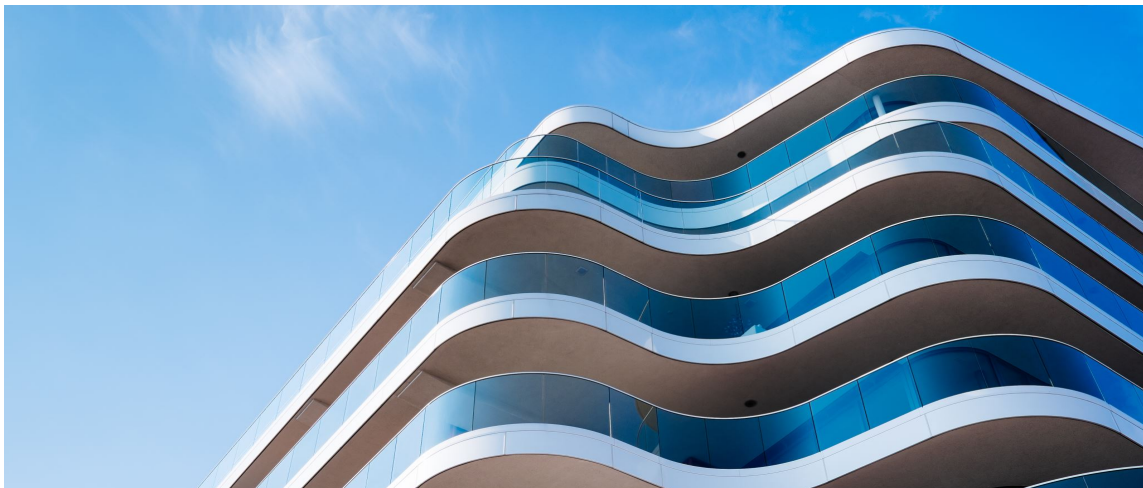| Energy	Water	Waste	Indoor Air Quality	Location & Transportation	Materials

New Construction Certifications

Green building certifications for new construction (or significant renovation) typically focus on the design and construction phase, assessing factors like site election, energy-efficient design, water conservation, sustainable materials, and indoor environmental quality. Certifications for new construction often involve a life cycle assessment to consider the environmental impact of materials and construction processes.

Existing Building Certifications

Green building certifications for existing buildings focus on operational efficiency, considering ongoing energy and water consumption, waste management, and maintenance practices. They oftentimes involve the implementation of retrofits or upgrades to enhance overall sustainability.

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CERTIFICATION	OVERVIEW	PHASE
LEED	– Internationally recognized as the leading green building certification system – Buildings must meet prerequisites in five categories. – Point-based system with Certified, Silver, Gold, and Platinum ratings. – LEED released pilot rating system, v4.1, and new Recertification Guidance in 2018. – Certification based on Performance Scores within Arc software. – Data is collected and sent to the USGBC. – Projects may need to be recertified periodically. – LEED v4 remains in use, but LEED v5 rolled out in 2025 with a greater focus on decarbonization, health, equity, and resilience.	– New Construction – Fit Outs – Interior Space – Existing Building
BREEAM®	– New to the U.S. in 2017, BREEAM is the world's first and most widely used sustainability assessment method. – No prerequisites or mandatory changes to existing buildings are required. – Licensed assessors collect evidence for certification. – Recertification is recommended every 3 years. – Point-based system with ratings from Pass to Outstanding.	– New Construction – Existing Building
IREM® CERTIFIED SUSTAINABLE PROPERTY	– Attainable, affordable, and meaningful recognition program – Less stringent requirements for multi-family and retail properties compared to other green building certifications. – Requires 75% occupancy for at least 18 months. – ENERGY STAR-certified properties automatically receive all energy performance points. – Recertification required every 3 years. – Single Certification designation	– Existing Building
GREEN GLOBES BUILDING CERTIFICATION	– Aims to provide customized guidance in the operation of high-performance buildings through checklist approach. – 2025 modules have expanded for Net Zero, Data Centers, and Multifamily. – No prerequisites or mandatory changes to existing buildings are required. – Certification does not expire unless the project undergoes significant changes. – Point-based system with ratings from 1 to 4 Globes.	– New Construction – Interior Space – Fit Outs – Existing Building
BOMA 360 PERFORMANCE PROGRAM	– Very affordable. – Updated criteria released in 2025 for both Office and Industrial buildings. – Minimum points required in each category. – Requires tenant engagement and benchmarking participation. – Annual survey and full renewal are required every 3 years.	– Existing Building

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ENERGY STAR Portfolio Manager

All Newmark-managed office, industrial, and retail properties over 25,000 square feet are required to create and maintain an ENERGY STAR Portfolio Manager (ESPM) account. Once the account is established, access must be shared with the Newmark Energy & Sustainability team's ESPM account: NKF Energy.

This policy supports compliance with government-mandated energy benchmarking requirements and helps improve energy efficiency, lower costs, optimize capital investment, reduce greenhouse gas emissions.

ENERGY STAR Portfolio Manager

ENERGY STAR Portfolio Manager, developed by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy, is a free online platform used to track a building's energy and water use, greenhouse gas emissions, and waste. It serves as the standard reporting tool for most U.S. and local energy benchmarking regulations.

ENERGY STAR Benchmarking and Scoring

For buildings with whole-building energy data (including both landlord and tenant consumption, Portfolio Manager generates a 1-100 ENERGY STAR score, which compares a building's performance to similar properties nationwide.

For buildings without whole-building data, energy intensity metrics (e.g., Site EUI) can still be tracked over time using landlord-only data.

ENERGY STAR Certification

Properties that score 75 or above (top 25% of similar U.S. buildings) are eligible to apply for ENERGY STAR Certification. Certification is valid for 12 months and must be renewed annually.

To be eligible:

- The property must be one of the eligible building types (see below).

- At least 12 months of complete whole-building data must be entered into Portfolio Manager.

- A licensed professional must verify the data before submittal.

Newmark is a member of ENERGY STAR Certification Nation, a recognition program for companies benchmarking and certifying buildings at scale.

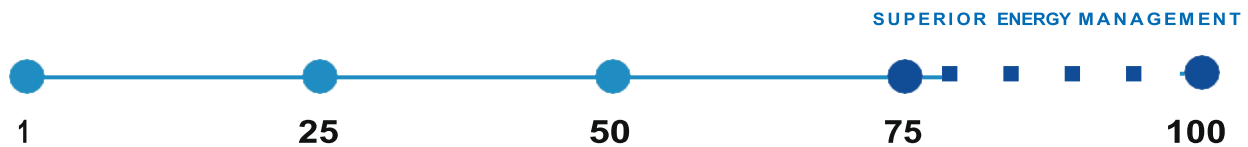| ONLY CERTAIN PROPERTY TYPES ARE ELIGIBLE FOR ENERGY STAR CERTIFICATION:		
– Office – Industrial – Distribution Center – Industrial – Warehouse / Manufacturing – Industrial – Refrigerated Warehouse	– Hotel – Data Center – Bank Branch – Multi-family Housing	– Retail – Single store* – Retail – Supermarket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

Certain eligibility criteria apply for these retail types

APPLYING FOR THE ENERGY STAR CERTIFICATION:
– Properties with an ENERGY STAR score of 75 or above are eligible to apply for ENERGY STAR certification annually. – Annual budgeting for certification costs is encouraged, as verification and submittal incur a fee.

1 TO 100 ENERGY PERFORMANCE SCALE
SUPERIOR ENERGY MANAGEMENT 1   25   50   75   100

OPERATIONAL CHARACTERISTICS THAT AFFECT YOUR SCORE:		
– Occupancy percentage – Weekly operating hours	– Worker count – Number of computers	– Any unusual variations (e.g., extended tenant hours)

These fields directly impact the ENERGY STAR score and must be updated in Portfolio Manager at least quarterly.

Using Portfolio Manager

– Track and monitor building energy, water, and waste use.

– Update monthly with new energy/water data; update operational characteristics at least quarterly.

– Ensure accurate reporting of occupancy and vacancy rates, weekly operating hours, and number of workers and computers.

– Comply with local energy benchmarking laws, which often require full-building data sharing, annual submissions, and public disclosure.

– Share Portfolio Manager access with the Newmark ESS team for compliance and certification coordination.

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Benchmarking Energy

– Enter the total current cost on each bill, including taxes and fees. Do not include late fees or unpaid balances.

– Sub-meter data should be entered separately for after-hours HVAC, data centers, or tenant equipment loads.

– Verify units of measure from the bill. Contact the utility if unclear. Only used approved ENERGY Star units.

– For Data Centers, record UPS (Uninterruptible Power Supply) energy data monthly in kWh.

– Load at least 12 months of historical energy data wherever possible.

APPROVED UNITS FOR ENERGY METERS IN PORTFOLIO MANAGER:	
– Kilowatt-hours (kWh) – Thousand British Thermal Units (kBtu) – Gigajoules (GJ) – Million British Thermal Units (MMBtu)	– Megawatt-hours (MWh) – Hundred Cubic Feet (ccf) – Cubic Feet (cf) – Therms

Benchmarking Water

– Classify water meters by use:

  • Potable Indoor: Domestic, process, cooling, restaurants, etc.

  • Potable Outdoor: Irrigation, landscaping, cooling towers

– When sub-meters exist (e.g., for irrigation), classify and enter them separately. Subtract their suage from main meters.

– Do not enter sewage volumes separately – instead, use the total cost from the water bill (includes sewer, stormwater, other charges)

– If charges are split, prorate by usage type (domestic vs. irrigation, etc.)

– Load at least 12 months of historical water data wherever possible.

APPROVED UNITS FOR WATER METERS IN PORTFOLIO MANAGER:	
– Gallons (gal) – Thousand Gallons (kgal) – Cubic Feet (cf) – Hundred Cubic Feet (ccf)	– Cubic Meters (m³) – Liters (L) – Kiloliters (kL)

Benchmarking Waste

– Track waste and recycling in ENERGY STAR Portfolio Manager similarly to energy and water.

– Acceptable waste types: trash, mixed recyclables, cardboard, compost, glass, e-waste, etc.

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- Track by:
  - Weight/volume
  - Container count and size
  - Pick-up frequency (if weight/volume is not provided, consult your hauler or use 100% Average Full for estimates).
- Enter cost data if available.
- Load at least 12 months of historical waste data wherever possible.

APPROVED UNITS FOR WASTE IN PORTFOLIO MANAGER:	
– Pounds (lbs.)	– Kilograms (kg)
– Tons (short tons)	– Metric Tons (mt)

Tracking And Reporting All Green Power

- Record onsite green power (e.g., solar, wind) using a separate Onsite Renewable Energy Meter.
- Record offsite renewable energy purchases (e.g., RECs, green power contracts) as Green Power Purchase entry.
- Select the correct energy source type (solar PV, wind, etc.) and enter all required production and cost fields.
- Green power does not reduce Site EUI but can improve a property's emissions metrics and qualify for ENERGY STAR recognition.

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Data Center Within the Premises

As defined by the U.S. EPA's ENERGY STAR program, 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, storage, and hosting. These spaces require dedicated power and cooling infrastructure, like Uninterruptible Power Supplies (UPS) and precision HVAC systems.

A Data Center may support:

- Traditional enterprise services

- Cloud/on-demand computing

- High-performance computing

- Internet facilities or co-location hosting environments

A Data Center is not just a server room or closet. The entire gross floor area must be measured – including raised-floor space, storage, battery rooms, and mechanical support areas.

IT Energy Configuration

Portfolio Manager requires an IT Energy meter entry for certified data centers. ENERGY STAR recommends that IT Energy be measured at the output of the Uninterruptible Power Supply (UPS)

- IT Energy = Total energy consumed by servers, storage systems, and all IT equipment.

- Measurements must be recorded in kWh monthly (not instantaneous power).

- Readings must be taken at least monthly.

If there is no UPS:

- The power Distribution Unit (PDU) can be used instead.

- The metering point must be as close as possible to the IT load.

Non-IT Load and Mixed Use

If more than 10% of UPS load powers non-IT equipment (e.g., HVAC, lighting), the data must be adjusted:

- Option 1: Subtract non-IT energy from total UPS load before entering into Portfolio Manager

- Option 2: If non-IT use cannot be measured separately, enter the energy from PDU meters that support IT equipment only.

As of August 2025, Portfolio Manager does not allow buildings with estimated IT Energy values to earn an ENERGY STAR score/certification. For simple data entry, however, properties may choose whether to use actual vs. estimated IT values.

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Legislated Benchmarking

Understanding Benchmarking

Energy benchmarking is the process of tracking a building's utility consumption over time to better understand its energy and water performance. By entering usage data into ENERGY STAR Portfolio Manager, building owners and managers can compare performance against national medians, similar building types, or performance thresholds.

Benchmarking is a critical first step towards managing energy use, complying with local laws, and planning for long-term emissions reductions. It provides the foundation for more advanced buildings performance regulations, such as carbon caps, energy performance targets, or retrofit mandates.

Benchmarking Requirements

Across the U.S., a growing number of cities and states have enacted benchmarking ordinances that require certain buildings – typically commercial, multifamily, and public properties over a size threshold – to submit annual energy and/or water data. These laws are often the first tier in a phased policy framework focused on emissions and sustainability.

Most benchmarking laws require:

- Annual submission of energy and water data via ENERGY STAR Portfolio Manager

- Data verification by a qualified third-party every 3-5 years

- Public disclosure of building performance metrics

- Penalties for noncompliance, ranging from a few hundred to several thousand dollars per property.
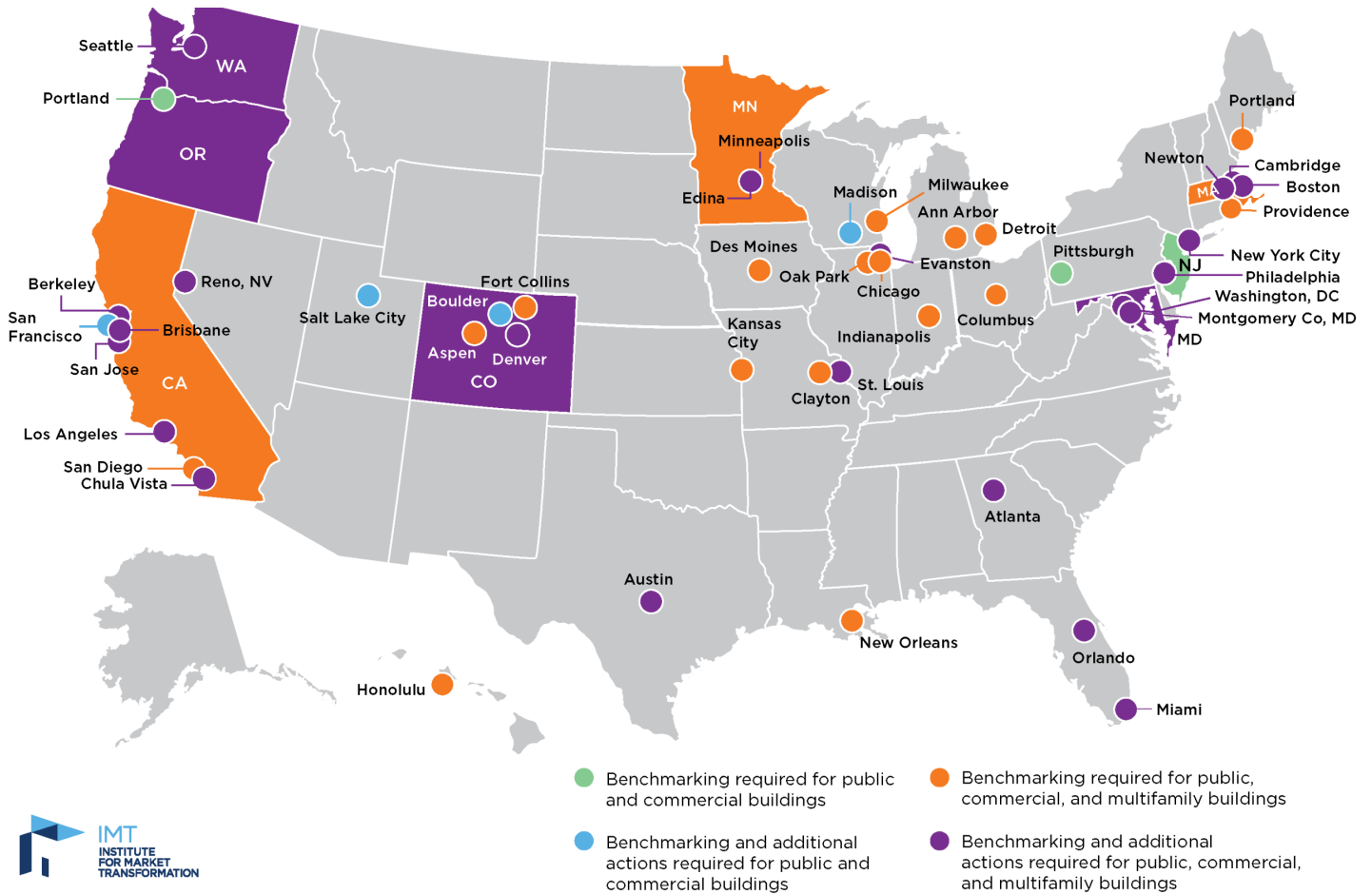
Benchmarking in 2025: A National Landscape

As of July 2025, over fifty jurisdictions nationwide have implemented benchmarking policies – including major metros like New York City, Boston, Los Angeles, and Chicago, as well as various counties and states. These policies vary in scope, but they all aim to:

- Increase transparency on building use.

- Create market pressure for efficiency improvements.

- Build the infrastructure for emissions tracking and compliance.

Benchmarking is no longer just a compliance task – it is a core function of strategic property management.

Many benchmarking programs are now being expanded or paired with Building Energy Performance Standards (BEPS), which set minimum efficiency or carbon thresholds for buildings. Benchmarking data is used to determine which buildings are out of compliance and to track progress over time. (See next section for details on BEPS and related performance standards)

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Seattle — WA
Portland — OR
MN — Minneapolis / Edina
Madison — Milwaukee
Des Moines — Ann Arbor — Detroit
Berkeley — Reno, NV
San Francisco — Brisbane — San Jose
Salt Lake City
Fort Collins / Boulder / Aspen / Denver — CO
Oak Park — Evanston / Chicago — Pittsburgh — NJ
Portland — Newton — Cambridge / Boston — Providence — MA
New York City — Philadelphia — Washington, DC — Montgomery Co, MD — MD
CA — Los Angeles
San Diego / Chula Vista
Kansas City — Indianapolis — Columbus
Clayton — St. Louis
Atlanta
Austin
New Orleans
Orlando
Honolulu
Miami

Legend:
- 🟢 Benchmarking required for public and commercial buildings
- 🟠 Benchmarking required for public, commercial, and multifamily buildings
- 🔵 Benchmarking and additional actions required for public and commercial buildings
- 🟣 Benchmarking and additional actions required for public, commercial, and multifamily buildings

IMT
INSTITUTE FOR MARKET TRANSFORMATION

Source: imt.org

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Legislated Benchmarking Calendar

MONTH	DATE	LOCATION	REPORTING	COVERED COMMERCIAL BUILDINGS	DATA VERIFICATION REQUIRED
APRIL	1st	Reno, NV	Energy, Water	≥ 30,000 SF	No
		Washington, D.C.	Energy, Water	≥ 25,000 SF	Yes (every 3 years)
	22nd	Portland, OR	Energy	≥ 20,000 SF	No
MAY	1st	Cambridge, MA	Energy, Water	≥ 25,000 SF	Yes (every 5 years)
		Kansas City, MO	Energy, Water	≥ 50,000 SF	No
		New York City, NY	Energy, Water	≥ 25,000 SF	No
		Orlando, FL	Energy, Water	≥ 50,000 SF	No
		Portland, ME	Energy, Water	≥ 20,000 SF	No
		St. Louis, MO	Energy, Water	≥ 50,000 SF	No
		San Francisco, CA	Energy	≥ 10,000 SF	No
		Salt Lake City, UT	Energy	≥ 25,000 SF	No
		San Jose, CA	Energy, Water	≥ 20,000 SF	No
	15th	Boston, MA	Energy, Water	≥ 35,000 SF	Yes (every 5 years)
		Brisbane, CA	Energy, Water	≥ 10,000 SF	No
		Lexington, MA	Energy, Water	≥ 25,000 SF	No
	25th	Providence, RI	Energy, Water	≥ 20,000 SF	No
	31st	New Orleans, LA	Energy	≥ 20,000 SF	No
JUNE	1st	Atlanta, GA	Energy, Water	≥ 25,000 SF	No
		Austin, TX	Energy	≥ 10,000 SF	No
		Ann Arbor, MI	Energy, Water	≥ 20,000 SF	No
		Aspen, CO	Energy, Water	≥ 5,000 SF	No
		Boulder, CO	Energy, Water	≥ 20,000 SF	No
		California	Energy, Water	≥ 50,000 SF	No
		Colorado	Energy	≥ 50,000 SF	No
		Maryland	Energy	≥ 35,000 SF	No
		Minnesota	Energy	≥ 50,000 SF	No
		Washington	Energy	≥ 20,000 SF	No
		Chicago, IL	Energy	≥ 50,000 SF	Yes (every 3 years)
		Columbus, OH	Energy, Water	≥ 50,000 SF	No
		Denver, CO	Energy	≥ 25,000 SF	No
		Los Angeles, CA	Energy, Water	≥ 20,000 SF	No
		Detroit, MI	Energy, Water	≥ 25,000 SF	No
		Fort Collins, CO	Energy, Water	≥ 5,000 SF	No
		Minneapolis, MN	Energy, Water	≥ 50,000 SF	No
		Indianapolis, IN	Energy, Water	≥ 50,000 SF	No
		Edina, MN	Energy, Water	≥ 25,000 SF	No
		Montgomery Co., MD	Energy	≥ 25,000 SF	Yes (every 3 years)
		Pittsburgh, PA	Energy, Water	≥ 50,000 SF	No
		San Diego, CA	Energy, Water	≥ 50,000 SF	No
		Seattle, WA	Energy	≥ 20,000 SF	No
	30th	Evanston, IL	Energy, Water	≥ 20,000 SF	Yes (every 3 years)
		Massachusetts	Energy, Water	≥ 20,000 SF	No
		Chelsea, MA	Energy, Water	≥ 20,000 SF	No
		Honolulu, HI	Energy, Water	≥ 25,000 SF	No

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		Madison, WI	Energy	≥ 25,000 SF	No
		Milwaukee, WI	Energy	≥ 50,000 SF	No
		Philadelphia, PA	Energy, Water	≥ 50,000 SF	No
		Miami, FL	Energy, Water	≥ 20,000 SF	No
JULY	1st	New Jersey	Energy, Water	≥ 25,000 SF	No
		Des Moines, IA	Energy, Water	≥ 25,000 SF	No
DECEMBER	31st	Oak Park, IL	Energy, Water	≥ 10,000 SF	No

Properties in jurisdictions with benchmarking ordinances must comply unless exempt. Be sure to confirm local requirements and exemption status each year. Deadlines may change – refer to the ENERGY STAR website for the most current dates.

Benchmark Rating Display

Several U.S. cities now require building owners to publicly post an energy performance rating informed by benchmarking results, including the building's ENERGY STAR score, to increase transparency and highlight efficiency.

Chicago Rating

Chicago was the first U.S. city to adopt this measure. Since 2019, buildings over 50,000 SF have been subject to a 1-to-4-star rating system. Buildings that do not comply with benchmarking requirements receive a score of 0 stars. Properties not eligible for an ENERGY STAR score are assigned a rating based on energy use per SF compared to national medians.

Once a rating is assigned, the owner must post it in a prominent location within the building and disclose it when listing the property for sale or lease. Properties that improve their ENERGY STAR score by ten points or more within two years receive an extra star in recognition.

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
ENERGY STAR SCORE + IMPROVEMENT (past 2 years)	61 – 80 + 10 points	51 – 60 + 10 points	41 – 50 + 10 points	31 – 40 + 10 points	11 – 30 + 10 points	–	–

New York City Rating

Under Local Law 33, New York City requires buildings over 25,000 SF to display an energy efficiency letter grade (A-D) and their 1-100 ENERGY STAR score at a public entrance. This requirement has been in effect since 2020. Buildings ineligible for an ENERGY STAR score are assigned an "N" grade (Not Applicable) and are not required to display a rating.

GRADE	A	B	C	D	F	N
ENERGY STAR SCORE	85+	70 – 84	69 – 55	0 – 54	Not Submitted	Exempt from benchmarking

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Legislated Building Audit, Retuning, & Retrocommissioning

Understanding Audits, Retuning, & Retrocommissioning

Building audit, retuning, and retrocommissioning (RCx) policies are designed to ensure that existing buildings operate as efficiently as possible by addressing performance gaps in systems and equipment. While benchmarking tracks consumption, these requirements go a step further by mandating periodic technical reviews of building operations.

- Energy Audits involved a detailed assessment of energy use and recommend cost-effective measures to reduce consumption.

- Retrocommissioning (RCx) focuses on tuning existing building systems (HVAC, lighting, controls) to optimize performance without major capital investment.

- Retuning is a lighter-touch approach than full RCx, emphasizing operational adjustments and low-cost fixes.

Audit and RCx Requirements

Most audit and RCx laws require:

- Periodic building audits (often every 10 years)

- Corrective action implementation for identified low- or no-cost measures.

- Documentation and reporting to the city or state to demonstrate compliance, often signed by a license professional

Audits, Retuning & Retrocomissioning in 2025: A National Landscape

As of July 2025, more than a dozen major U.S. cities and states have audit, retuning, or RCx requirements in place, including New York City, Seattle, San Francisco, Washington, D.C., and Washington State. Compliance cycles vary from five to ten years, but the intent is consistent: to move beyond reporting and require action. Noncompliance can result in fines ranging from one-time fees of several hundred dollars to daily penalties reaching into the thousands.

Many programs offer exemptions or alternative compliance pathways for high-performance buildings, commonly recognizing recent ENERGY STAR performance, LEED O+M certification, recent commissioning, etc. These pathways typically have a lookback window of one to five years, require substantiating documentation, and must be requalified each cycle to avoid duplicative work while preserving accountability.

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Legislated Building Audit, Retuning, & Retrocommissioning Calendar

JURISDICTION	YEAR ENACTED	COVERED COMMERCIAL BUILDINGS	COMPLIANCE REQUIREMENT	FREQUENCY	NOTES
New York, NY	2013	≥ 50,000 SF	ASHRAE Level II Energy Audit + RCx	Every 10 years	Must submit an Energy Efficiency Report (EER) to DOB Compliance due date based on tax block
Seattle, WA	2018	≥ 50,000 SF	Tune-Up (RCx-lite) to optimize building systems	Every 5 years	Smaller buildings phased in by 2021
San Francisco, CA	2011	≥ 10,000 SF	Energy Audit + RCx	Every 5 years	Paired with annual benchmarking
Washington, D.C.	2014	≥ 50,000 SF	Energy Audit or RCx required if failing to meet BEPS performance target	Linked to BEPS cycle	BEPS compliance drives audit requirement
Montgomery County, MD	2024	≥ 25,000 SF	Energy Audit or RCx required if failing to meet BEPS performance target	5-year BEPS cycle	BEPS compliance drives audit requirement
Washington	2026	≥ 50,000 SF	ASHRAE Level II Energy Audit + EEMs if EUIt not met	5-year BEPS cycle	Requires Energy Management Plan and O&M Program
Atlanta, GA	2015	≥ 25,000 SF	ASHRAE Level II Energy Audit	Every 10 years	Implementation of the identified EEMS is optional
Berkeley, CA	2018	≥ 25,000 SF	Energy Audit	Every 5 years	Paired with annual benchmarking
Boulder, CO	2015	≥ 50,000 SF	ASHRAE Level II Energy Audit	Every 10 years	Owners must implement one-time lighting upgrades within 5 years of their first ordinance deadline
Edina, MN	2019	≥ 25,000 SF	Energy Audit	Every 5 years	
Los Angeles, CA	2017	≥ 20,000 SF	ASHRAE Level II Energy Audit	Every 5 years	Compliance due date based on LADBS Building ID
Madison, WI	2023	≥ 50,000 SF	Tune-Up (RCx-lite) to optimize building systems	Every 4 years	
Orlando, FL	2016	≥ 50,000 SF	Energy Audit or RCx	Every 5 years	Applies to buildings with an ES score ≤ 50
Philadelphia, PA	2020	≥ 50,000 SF	Tune-Up (RCx-lite) to optimize building systems	Every 5 years	

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Reno, NV	2019	≥ 30,000 SF	Tune-Up (RCx-lite) to optimize building systems or an energy and water audit	Every 7 years	
Salt Lake City, UT	2017	≥ 22,000 SF	Tune-Up (RCx-lite) to optimize building systems	Every 5 years	Applies to buildings with an ES score ≤ 49 Compliance due date based on tax ID number
San Jose, CA	2018	≥ 20,000 SF	Tune-Up (RCx-lite) to optimize building systems or an energy and water audit	Every 5 years	Compliance due date based on APN

New York, NY – Local Law 87 (LL87)

Local Law 87 requires most New York City buildings over 50,000 SF to undergo an energy audit and retrocommissioning (RCx) of base building systems on a 10-year cycle. Base systems typically include lighting, supplemental loads, HVAC distribution, central heating/cooling plants, and controls. Results are documented in an Energy Efficiency Report (EER), prepared on the Department of Building's standard template, and filed by December 31 of the building's assigned calendar year (determined by the last digit of the tax block number).

The EER records the audit's recommended measures and savings and the RCx findings and corrections. Penalties for not filing are up to $3,000 for the first year missed and $5,000 for each additional year until compliance.

San Francisco, CA – Existing Buildings Ordinance (EBO)

San Francisco's Existing Buildings Ordinance (EBO), which coincides with annual benchmarking, requires owners of commercial buildings over 10,000 SF to complete a comprehensive energy efficiency audit by a qualified professional every five years. The entire building must be examined, including tenant-occupied spaces. Buildings between 10,000 and 49,999 SF require an ASHRAE Level I audit, while buildings 50,000 SF and larger require an ASHRAE Level II audit. The audit produces a detailed Energy Audit Report that identifies cost-effective energy efficiency improvements available in the building; implementation is at the owner's discretion.

High-performance buildings that have received ENERGY STAR certification in at least three of the past five years or LEED for Existing Buildings certification within the past five years are eligible for an exemption.

Philadelphia, PA – Building Energy Performance Program (BEPP)

Philadelphia's Building Energy Performance Program (BEPP) requires commercial buildings over 50,000 SF to complete a building tune-up every five years that identifies and corrects low- and no-cost operational issues in base building systems. Building operators and an approved Tune-Up Specialist must work together to complete the City's Tune-Up Workbook accurately and submit it by the compliance deadline, then repeat the process every five years. The compliance schedule is phased by building size, with the largest buildings due first.

Owners may satisfy BEPP through high-performance/alternative compliance pathways in lieu of a tune-up. Examples include an ENERGY STAR certification within the prior year, documented 15% energy savings, recent retrocommissioning or ongoing commissioning, or an ASHRAE Level II audit with all low-/no-cost measure implemented. Penalties for missed deadlines begin with a $2,000 citation.

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Legislated Building Energy Performance Standards (BEPS)

Understanding BEPS

Over the past several years, an increasing number of cities and states have adopted Building Energy Performance Standards (BEPS) or greenhouse gas (GHG) emissions ordinances as part of their climate action goals. Unlike energy benchmarking laws, BEPS mandates actual performance improvements over time – either through reduced energy use intensity (EUI), lower carbon emissions, or achieving set efficiency targets.

BEPS Requirements

These regulations apply primarily to commercial and multifamily buildings over a certain size threshold and are often built upon existing benchmarking frameworks. Buildings that do not meet the minimum performance standards must follow compliance pathways that include implementing energy conservation measures, performing audits, enrolling in performance tracking programs, etc.

BEPS programs typically include phased timelines, compliance cycles, and substantial fines for non-compliance, sometimes as high as $10 per square foot annually. The policies are structured to encourage early action and allow flexibility in how building owners choose to comply. Many cities also provide resources, audit incentives, and technical support for compliance planning.

BEPS in 2025: A National Landscape

As of July 2025, more than fifteen jurisdictions nationwide have adopted BEPS, including Washington, D.C., New York City, Boston, Denver, Seattle, and the State of Washington, along with several other cities and states preparing to follow. Across the U.S., BEPS programs are tied directly to climate targets, such as carbon neutrality by 2050. Standards are structured to ratchet down every cycle, ensuring that covered buildings steadily progress toward net-zero emissions.

Most programs use one of two core metrics: energy performance (e.g., weather-normalized Site EUI) or carbon performance (e.g., $kgCO2_e/SF$) – with some jurisdictions shifting from energy to carbon over time. Coverage typically starts around 20,000 to 50,000 SF and phases in by size cohort with interim checkpoints before each tighter standard. Many jurisdictions also credit on-site or off-site renewables and/or provide electrification bonuses, and nearly all require annual benchmarking with periodic third-party verification to underpin performance claims.

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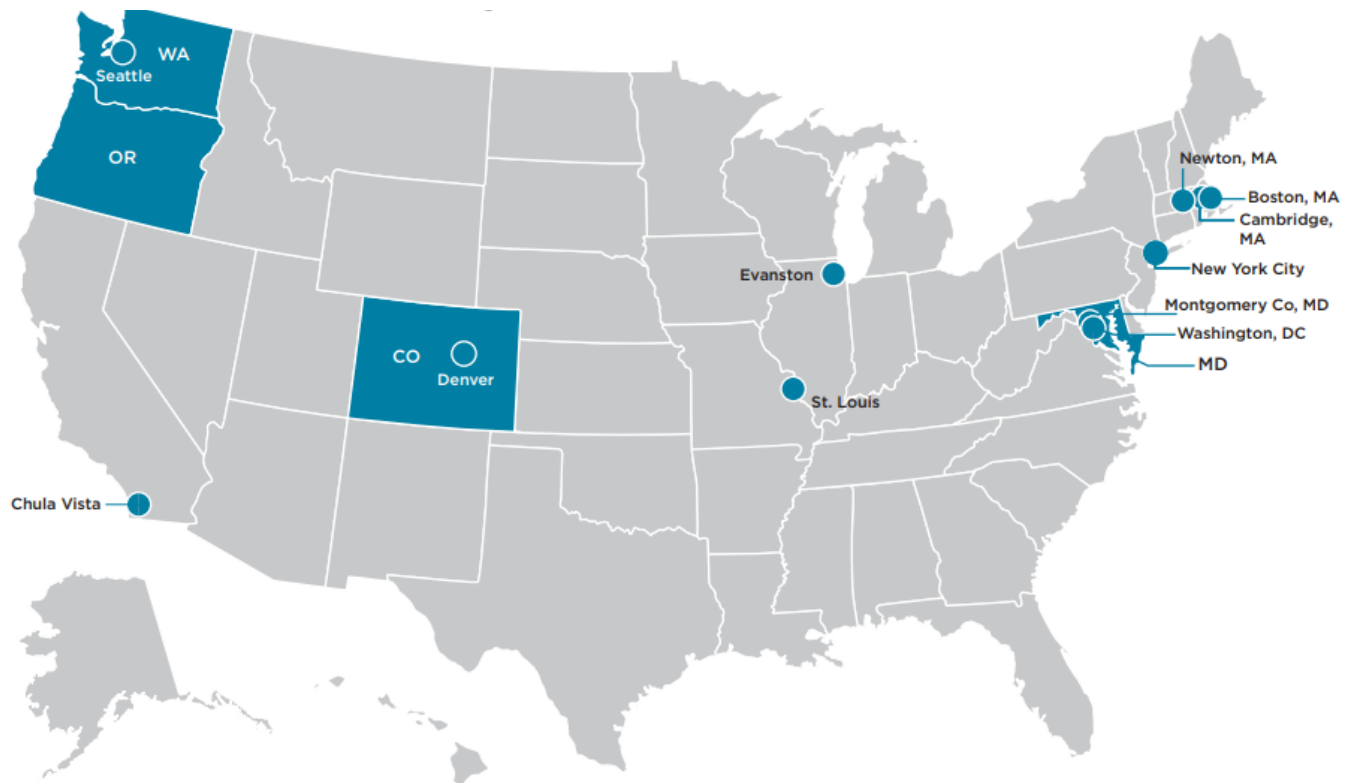
Source: imt.org

Legislated BEPS Calendar

JURISDICTION	PERFORMANCE STANDARD START YEAR	COVERED COMMERCIAL BUILDINGS	COMPLIANCE METRIC	FIRST REPORTING DEADLINE	NOTES
New York, NY	2024	≥ 25,000 SF	Annual greenhouse gas (GHG) emissions (tCO_2e/SF)	May 1, 2025	
Boston, MA	2025	≥ 20,000 SF	Annual greenhouse gas (GHG) emissions ($kgCO_2e$/SF/year)	May 15, 2026	
Cambridge, MA	2025 (Pending)	≥ 25,000 SF	TBD	2035 (tentative)	Policy under development
Washington, D.C.	2021	≥ 25,000 SF	ENERGY STAR score or source EUI	April 1, 2027	
St. Louis, MO	2025	≥ 50,000 SF	Site Energy Use Intensity	May 1, 2026	
Denver, CO	2024	≥ 25,000 SF	Weather Normalized Site Energy Use Intensity	June 1, 2025	
Seattle, WA	2026	≥ 20,000 SF	Greenhouse gas emissions intensity targets ($kgCO_2$/SF/year)	2027 (TBD)	Exact reporting date TBD
Chula Vista, CA	2023	≥ 20,000 SF	ENERGY STAR score or Weather Normalized Site Energy Use Intensity	June 1, 2024	Confirm local deadlines
Montgomery County, MD	2024	≥ 25,000 SF	Normalized Site Energy Use Intensity	July 1, 2027	
Washington	2026 (Proposed)	≥ 50,000 SF	Weather-normalized Energy Use Intensity	June 1, 2027 (Expected)	Program in development
Colorado	2026 (Proposed)	≥ 50,000 SF	Site Energy Use Intensity or GHGI	June 1, 2027 (Expected)	Program in development
Maryland	2030	≥ 35,000 SF	Net direct emissions standards (CO_2e/SF)	June 1, 2031	
Newton, MA	2024 (Developing)	≥ 20,000 SF	CO_2 Emissions ($kgCO_2$/SF/year)	September 15, 2025	Final rules not yet published
Oregon	2027	≥ 35,000 SF	Energy Use Intensity	June 1, 2028	

New York, NY – Local Law 97 (LL97)

Local Law 97 (LL97), enacted in 2019 as part of New York City's Climate Mobilization Act, is one of the most ambitious building decarbonization laws in the United States. Buildings account for nearly 70% of the city's greenhouse gas emissions, and LL97 targets these emissions directly by establishing annual carbon intensity limits for most properties over 25,000 square feet. Compliance begins with the 2024 reporting year, and the limits tighten substantially in 2030 as the city works toward its overarching goal of carbon neutrality by 2050.

Covered buildings must calculate their annual emissions based on on-site energy consumption, which includes electricity, natural gas, fuel oil, district steam, and other fuels. Each building's emissions cap is determined by multiplying its square footage by the carbon intensity factor (tCO2e/SF) assigned to its occupancy group under the law. To comply, total annual emissions must remain below this cap. The law anticipates increasingly strict limits over time, particularly in 2030 and beyond, requiring owners to implement efficiency measures, renewable energy projects, or electrification strategies well in advance.

Compliance is enforced through both performance and reporting penalties. Buildings that exceed their emissions cap are fined at a rate of $268 per metric ton of CO_2-equivalent (tCO_2e) above the limit. Separate penalties apply if required emissions reports are not filed on time. Beginning in 2025 (for the 2024 calendar year), building owners must submit an annual emissions report, certified by a registered design professional, to the Department of Buildings (DOB) by May 1 each year. Failure to submit triggers a fine of $0.50 per SF per month until the report is filed, with continued accrual if the violation is not corrected within 12 months.

Property Type	Carbon Limit ($kgCO_2 e$/SF)				
LIMITS PER YEAR	2024 - 2029	2030-2034	2035-2039	2040-2049	2050-
College/University	9.9	2.1	1.2	0.2	0
Hotel	9.9	3.9	2.6	1.5	0
Manufacturing/Industrial	7.6	1.4	1.0	0.5	0
Multifamily Housing	6.8	3.4	2.7	2.1	0
Office	7.6	2.7	1.7	0.6	0
Retail	7.6	2.1	1.2	0.2	0

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Boston, MA – Building Emissions Reduction and Disclosure Ordinance (BERDO 2.0)

The Building Emissions Reduction and Disclosure Ordinance (BERDO 2.0), enacted in 2021, is Boston's primary building decarbonization law, supporting the city's goal of carbon neutrality by 2050. It requires non-residential buildings over 20,000 SF and residential buildings with fifteen or more units to report annual energy and water use by May 15 each year.

BERDO sets mandatory greenhouse gas emissions limits for covered properties, with caps tightening over time. Owners can comply through efficiency upgrades, electrification, or renewable energy procurement. As an alternative, the law allows compliance payments equal to the average cost of retrofit reductions, currently estimated at $234 per metric ton of CO_2.

Failure to comply or make payments results in significant penalties. Buildings are subject to daily fines ranging from $300 to $1,000, depending on size, until violations are corrected. The City of Boston's Environment Department enforces these requirements and tracks progress toward emissions goals.

Property Type	Carbon Limit KG (kgCO$_2$ e/SF)					
LIMITS PER YEAR	2025 – 2029	2030 – 2034	2035 – 2039	2040 – 2044	2045 – 2050	2050 -
Assembly	7.8	4.6	3.3	2.1	1.1	0
College/University	10.2	5.3	3.8	2.5	1.2	0
Education	3.9	2.4	1.8	1.2	0.6	0
Food Sales &Service	17.4	10.9	8.0	5.4	2.7	0
Healthcare	15.4	10.0	7.4	4.9	2.4	0
Lodging	5.8	3.7	2.7	1.8	0.9	0
Manufacturing/Industrial	23.9	15.3	10.9	6.7	3.2	0
Multifamily Housing	4.1	2.4	1.8	1.1	0.6	0
Office	5.3	3.2	2.4	1.6	0.8	0
Retail	7.1	3.4	2.4	1.5	0.7	0
Services	7.5	4.5	3.3	2.2	1.1	0
Storage	5.4	2.8	1.8	1.0	0.4	0
Technology/Science	19.2	11.1	7.8	5.1	2.5	0

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Washington, D.C. – Building Energy Performance Standards (BEPS)

The Building Energy Performance Standard (BEPS) was established under the Clean Energy DC Omnibus Act of 2018 and is managed by the Department of Energy and Environment (DOEE). Its goal is to support the Sustainable DC Plan's target of reducing greenhouse gas emissions and energy consumption by 50% by 2032.

BEPS is structured in three six-year compliance periods:

- Period 1 (Cycle 1): Began on January 1, 2021, covering private buildings over 50,000 SF and DC-owned buildings over 10,000 SF. It runs through December 31, 2026, including a COVID-19 one-year delay, and evaluation occurs in 2027.

- Period 2 (Cycle 2): Begins on January 1, 2028, applying to private buildings over 25,000 SF. The compliance cycle runs through 2032, with evaluation in 2033.

- Period 3 (Cycle 3): Begins on January 1, 2034, extending BEPS to private buildings 10,000 SF and larger. This cycle is expected to run through 2038, with evaluation in 2039.

For building types eligible for an ENERGY STAR Score, the BEPS benchmark is the local median ENERGY STAR Score. For building types ineligible for ENERGY STAR Score, the metric used is local median Source Energy Use Intensity (EUI).

Buildings that fail to meet the standard at the start of a cycle must enter a compliance cycle, during which they must choose a pathway to improve performance (e.g., Performance, Standard Target, Prescriptive, or Trajectory/Alternative Pathway). They have up to five years to achieve compliance. If a building remains non-compliant by the end of the cycle, the maximum penalty is $10 per SF, with total penalties capped at $7,500,000 and reduced proportionally based on performance toward the target.

Property Type	Metric	Standard Level	Standard
Hotel	ENERGY STAR Score	Local Median	54
K-12 School	ENERGY STAR Score	Local Median	36
Multifamily Housing	ENERGY STAR Score	Local Median	66
Office	ENERGY STAR Score	Local Median	71
Other – Public Services	Source EUI	Local Median	229.4
Fitness Center	Source EUI	National Median	206.6

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Denver, CO – Energize Denver

The Energize Denver Ordinance, passed in 2021 and managed by the Office of Climate Action, Sustainability, and Resiliency (CASR), is a cornerstone of the city's strategy to eliminate greenhouse gas emissions from buildings by 2040. The policy supports Denver's climate commitment to reach net-zero energy in all new buildings by 2030 and net-zero in all existing buildings by 2040.

Energize Denver establishes performance requirements in cycles that drive a 30% reduction in energy use intensity (EUI) across all covered buildings by 2030, with additional interim deadlines. For buildings over 25,000 SF, compliance is measured using weather-normalized site EUI against a 2019 baseline. Smaller properties between 5,000 and 24,999 SF are subject to prescriptive requirements rather than EUI targets. These buildings must either install LED lighting covering at least 90% of the load, achieve lighting power density consistent with the 2019 Denver Building and Fire Code, or offset at least 20% of annual energy use with renewable energy.

The policy includes renewable energy and electrification incentives. On-site and off-site solar generation is fully credited against the electricity portion of a building's energy use before performance targets are evaluated, effectively lowering its calculated EUI. In addition, buildings that achieve 80% electrification of heating and hot water systems qualify for a 10% EUI performance credit, easing compliance thresholds.

Noncompliance may result in fines of up to $0.30 per kBtu above the required target. After the final compliance deadline (2030 or 2032 for those on the extended schedule), buildings must maintain their performance. Falling short during this maintenance phase triggers a reduced penalty of $0.05 per kBtu over the limit. In certain cases, particularly if benchmarking data is not submitted or verified, penalties may be as high as $0.70 per kBtu.

Property Type	Target EUI (kBtu/SF/yr)
Hotel	61.1
Restaurant	194.1
Multifamily Housing	44.2
Office	48.3
Distribution Center	25.4
Medical Office	69.0

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Washington – Clean Buildings Performance Standard (CBPS)

The Washington State Clean Buildings Performance Standard (CBPS) was established under the Clean Buildings Act (HB 1257) in 2019 and is administered by the Washington State Department of Commerce. It is one of the first statewide building performance standards in the U.S., intended to reduce energy use and greenhouse gas emissions from the built environment while supporting the state's goal of reaching net-zero emissions by 2050.

CBPS is structured in three compliance phases based on building size, with five-year compliance cycles:

- Phase 1: Applies to non-residential buildings over 220,000 SF. Compliance is required by June 1, 2026, with performance evaluated against state-defined Energy Use Intensity Targets (EUIt).

- Phase 2: Extends to non-residential buildings over 90,000 SF. Compliance is required by June 1, 2027, with evaluation occurring in the same year.

- Phase 3: Covers non-residential buildings over 50,000 SF. Compliance is required by June 1, 2028, with evaluation beginning in 2028.

To comply, building owners must demonstrate that their weather-normalized site Energy Use Intensity (EUI) is below the EUIt established for their property type. These EUIt values vary not only by building use but also by climate zone:

- Zone 4C (marine climate) covers much of western Washington, including the Puget Sound region.

- Zone 5B (cold-dry climate) covers eastern Washington, including cities such as Spokane and Yakima.

In addition, the standard includes an adjustment for new buildings. Properties permitted on or after July 1, 2016, must meet a 15% stricter EUIt than their baseline target, reflecting the expectation that recently constructed buildings already benefit from stringent energy codes.

If a building cannot meet its EUIt, owners must comply through the Investment Criteria Pathway, which requires conducting an ASHRAE Level II Energy Audit, completing a Life Cycle Cost Analysis, and implementing identified Energy Efficiency Measures (EEMs). Regardless of pathway, all covered buildings must submit an Energy Management Plan and maintain an Operations and Maintenance Program to ensure energy-efficient operations and minimize system failures.

Noncompliance may result in penalties of up to $5,000 plus $1 per SF per year until compliance is achieved.

Property Type	Zone 4C EUIt	Zone 5B EUIt	Zone 4C EUIt Adjusted (Post-2016)	Zone 5B EUIt Adjusted (Post-2016)
Hotel	68	72	57.8	61.2
Restaurant	361	378	306.9	321.3
Multifamily Housing	32	33	27.2	28.1
Office	63	66	53.6	56.1
Distribution Center	36	44	30.6	37.4
Medical Office	60	65	51	55.3

Seattle, WA – Building Emissions Performance Standard (BEPS)

Seattle adopted its Building Emissions Performance Standard (BEPS) in December 2023 to directly regulate carbon pollution from existing buildings, which make up more than one-third of citywide emissions. The policy applies to non-residential and multifamily buildings over 20,000 SF. Compliance pathways include meeting the standard greenhouse gas intensity target (GHGIT), applying prorated targets across multi-use or campus portfolios, or pursuing alternative compliance such as payments tied to the cost of carbon.

BEPS is structured in five compliance phases based on building size, with five-year compliance cycles:

- Phase 1: Applies to buildings over 220,001 SF. Must verify energy and emissions data in 2027 and meet their first GHGIT by 2031.

- Phase 2: Applies to buildings between 90,001 and 220,000 SF. Must verify energy and emissions data in 2027 and meet their first GHGIT by 2032.

- Phase 3: Applies to buildings between 50,0001 and 90,000 SF. Must verify energy and emissions data in 2028 and meet their first GHGIT by 2033.

- Phase 4: Applies to buildings between 30,0001 and 50,000 SF. Must verify energy and emissions data in 2029 and meet their first GHGIT by 2034.

- Phase 5: Applies to buildings between 20,0001 and 30,000 SF. Must verify energy and emissions data in 2030 and meet their first GHGIT by 2035.

Reporting failures can result in fines of $7,500 to $15,000, while emissions targets trigger penalties of $2.50/SF for low-income housing, $7.50/SF for other multifamily, and $10/SF for nonresidential buildings.

Property Type	GHGITs (kgCO$_2$e/SF/yr)			
LIMITS PER YEAR	2031 – 2035	2036 – 2040	2041 – 2045	2046 – 2050
College/University	2.69	1.57	0.0	0.0
Restaurant	5.57	3.34	0.0	0.0
Hospital	4.68	2.73	0.0	0.0
Hotel	2.06	1.20	0.0	0.0
Laboratory	6.30	3.68	0.0	0.0
Multifamily Housing	0.89	0.63	0.37	0.0
Office	0.81	0.47	00.0	0.0
Retail Store	1.03	0.60	0.0	0.0
Worship Facility	1.20	0.70	0.0	0.0

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Other Markets

See the map in section *BEPS in 2025: A National Landscape* for a full view of markets as of July 2025.

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.

Climate-Related Disclosures

Understanding Climate-Related Disclosures

Climate-related disclosures are reports that companies provide detailing the climate risks and opportunities that could materially affect their business, strategy, financial performance, as well as their governance, risk management practices, and greenhouse gas (GHG) emissions. Standardized frameworks, such as the Task Force on Climate-Related Financial Disclosures (TCFD), help investors and other stakeholders assess a company's exposure to physical climate hazards and transition risks in a low-carbon economy, enabling more informed decision-making.

Scope 1, 2, and 3 Emissions

Scopes 1, 2, and 3 are the standard buckets for a company's GHG emissions. They give a common, GHG Protocol-based way to quantify a company's emissions for performance comparison. Scope 1 are direct emissions from sources the company owns or controls (e.g., onsite fuel combustion, company vehicles, process refrigerants). Scope 2 are indirect emissions from purchased energy – mainly electricity, steam, heat, or cooling used by the company. Scope 3 includes all other indirect value-chain emissions, upstream and downstream. This includes purchased goods and services, supplier transport, employee commuting, use of sold products, end-of-life, and more. Scope 3 is often the largest share and the hardest to measure because it depends on supplier and customer activity outside of the company's direct control.

Climate-Related Disclosures in 2025: A National Landscape

California is currently the only US state with comprehensive, mandatory climate-disclosure laws: SB 253 and SB 361 for large companies doing business in the state. Implementation is underway, with formal rulemaking and initial reporting beginning in 2026. At the federal level, the Securities and Exchange Commission (SEC) adopted climate-related disclosure rules in March of 2024, but ultimately voted to end its legal defense of the rule one year later, leaving its future uncertain while litigation continues. With investor pressures rising and copycat bills already surfacing in other states, we can expect additional states to follow California's lead over the next few years.


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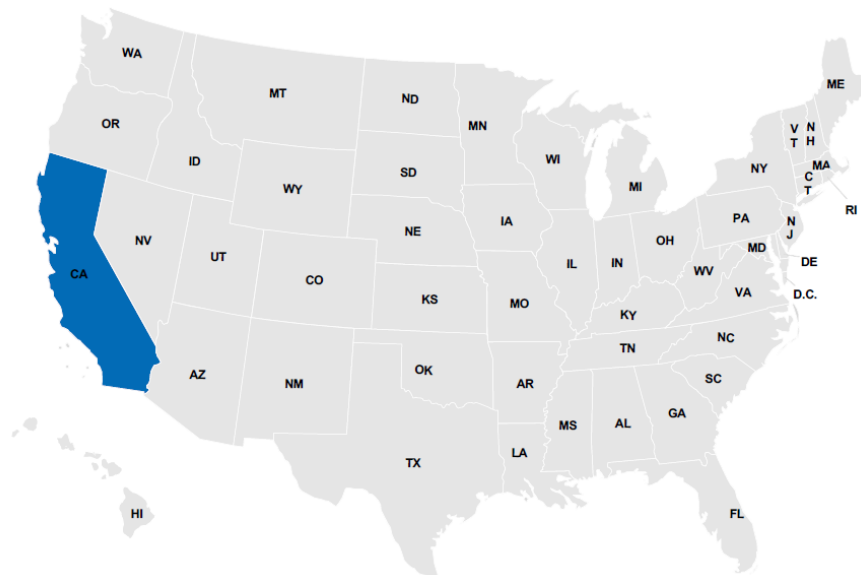
California – Senate Bill 253 (SB 253): Climate Corporate Data Accountability Act (CCDAA)

California SB 253, the Climate Corporate Data Accountability Act, requires public and private U.S.-based companies doing business in California with over $1 billion in annual revenue to publicly disclose their GHG emissions each year – Scope 1 and 2 beginning in 2026, and Scope 3 in 2027. Reports must follow the GHG Protocol and include third-party assurance that phases in (from limited to reasonable). The specific 2026 due date for the first emissions report has not yet been released. The California Air Resources Board (CARB), the agency developing and enforcing these climate-disclosure regulations, may assess penalties of up to $500,000 per year for failing to submit a required report; however, no SB 253 penalties will be imposed in 2026 if a company demonstrates a good-faith effort to prepare its report.

California – Senate Bill 261 (SB 261): Climate-Related Financial Risk Act (CRFRA)

California SB 261, the Climate-Related Financial Risk Act, requires public and private U.S.-based companies doing business in California with over $500 million in annual revenue to submit a public, TCFD-style climate-risk report every two years, starting January 1, 2026. This report must describe the company's climate-related financial risks and the measures adopted to mitigate and adapt to those risks, and it must be posted on the company's website. CARB may assess penalties of up to $50,000 per year for missing, incomplete, or misleading reports; as with SB 253, no penalties will be imposed in the first reporting year if the company shows a good-faith effort to comply.

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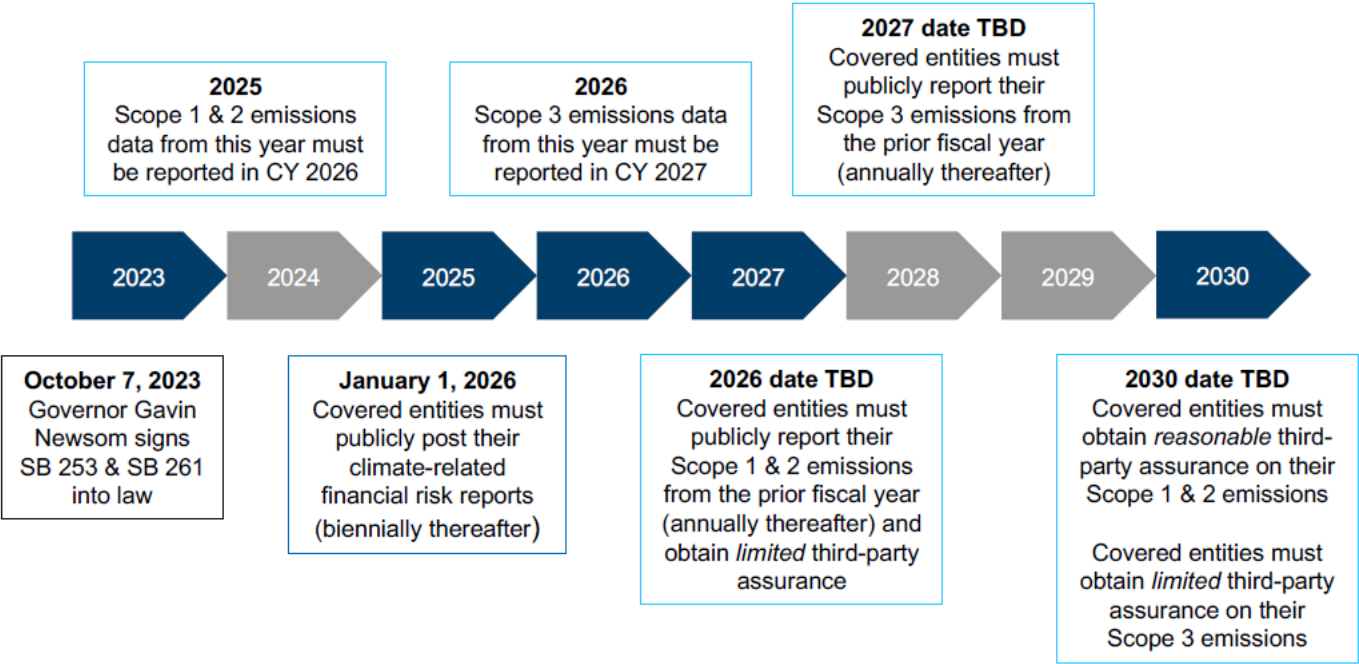
Energy Efficiency

Many no- and low-cost actions can extend equipment life, reduce utility spending, and lower greenhouse gas emissions. Embedding efficiency into day-to-day operations, supported by data from ENERGY STAR Portfolio Manager and periodic tuning, helps buildings control costs, meet internal ESG goals, and prepare for emerging BEPS/carbon standards.

Suggested Steps for Improving Efficiency

1. **Set Targets:** Establish short- and long-term energy and emissions goals aligned with corporate objectives and local regulations.

2. **Benchmark & Verify:** Track usage and cost in ENERGY STAR Portfolio Manager and complete periodic third-party data checks.

3. **Tune Operations:** Implement building tune-ups/retrocommissioning to correct schedules, setpoints, and controls and resolve maintenance issues.

4. **Implement ECMs:** Prioritize cost-effective upgrades (LEDs, smart controls, HVAC optimization, insulation/air sealing, heat-pump readiness) using SIR/payback.

5. **Leverage Incentives:** Pursue utility rebates and applicable tax incentives.

6. **Engage People:** Train operators and inform occupants/vendors to reinforce efficient practices.

7. **Measure & Plan:** Monitor results, recommission every three to five years, and maintain a multi-year capital plan that aligns with BEPS timelines.

If a property is not performing the top 25% of comparable buildings (e.g., ENERGY STAR score < 75), consider an ASHRAE Level I/II energy audit or building tune-up with Newmark ESS. The assessment will produce a prioritized list of energy conservation measures (ECMs) with costs and projected savings 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)
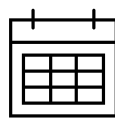
– Contact Newmark ESS to conduct a lighting audit on the property, grounds, and parking.

– Ask Newmark ESS about available incentives.

Light Emitting Diode LEDs

– 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 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.

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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 to 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

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HVAC Equipment

- In vacant spaces, turn HVAC off or to minimal temperature settings of 68º F or lower during colder months and 78º 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 compare 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 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.

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- 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 heaters, 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 always run at full speed, 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.
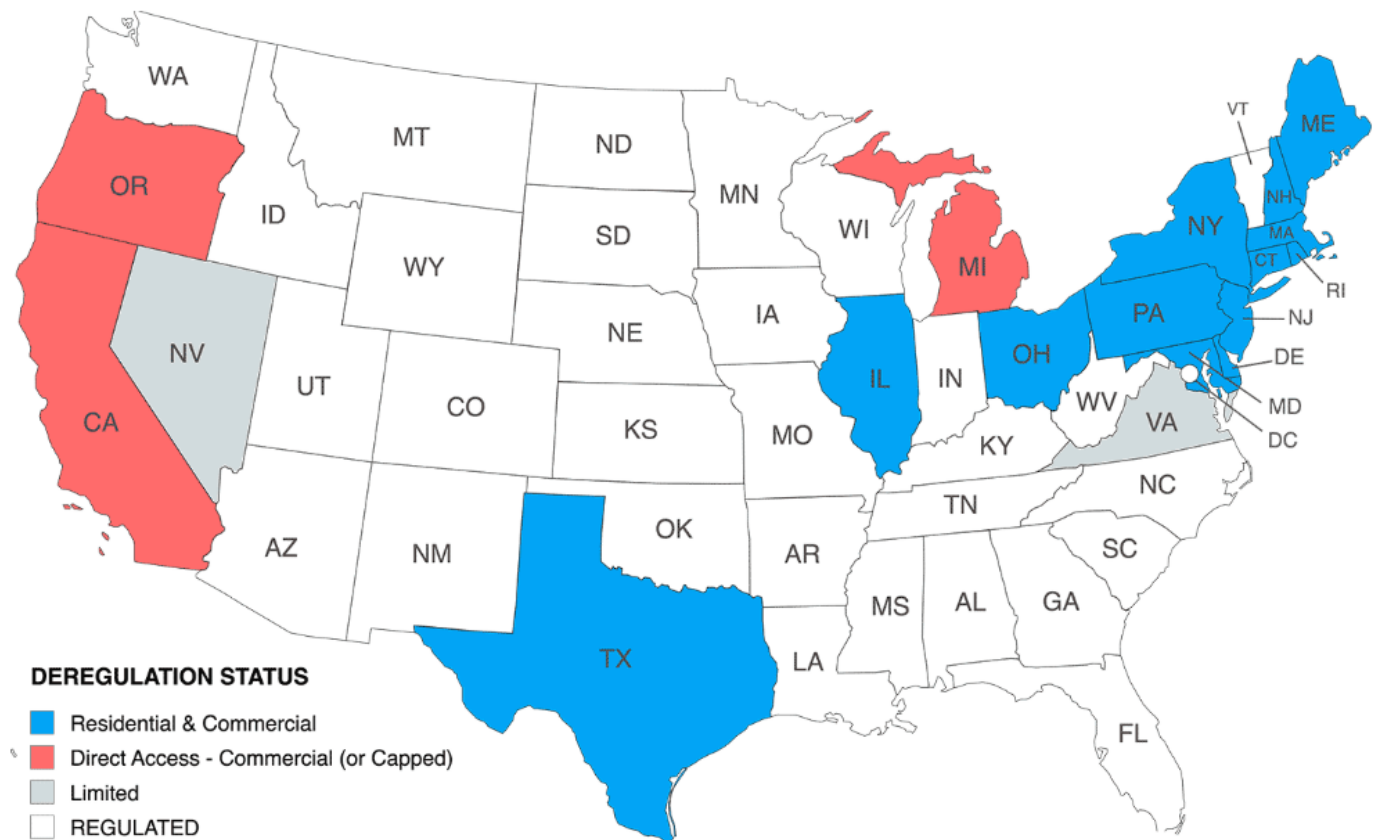
Energy Procurement

In about half of the country, customers are allowed some form of retail choice for electricity and/or natural gas. In these deregulated markets, you can select a third-party supplier while the local utility still delivers the energy and maintains the wires/pipes. Prices are market-based and negotiable and typically unbundle components such as energy, transmission, ancillaries, and various pass-throughs. In regulated (monopoly) states, supply is set by tariff, but there is still meaningful savings potential from rate optimization, power factor correction, demand response, and on-site or community solar.

Thoughtful procurement is a financial and carbon strategy – hedging and contract structure stabilize budgets, competitive and load-shaped buys lower total cost, and clean-energy options cut emissions while supporting BEPS/local compliance.

Deregulated Energy States and Markets Map

As of August 2025

DEREGULATION STATUS
- Residential & Commercial
- Direct Access - Commercial (or Capped)
- Limited
- REGULATED

Source: electricchoice.com

Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gases in the Earth's atmosphere that trap heat from the sun. The primary greenhouse gases include carbon dioxide, methane, nitrous oxide, water vapor, and ozone. Human activities have dramatically increased the concentration of these gases, enhancing the natural greenhouse effect and leading to global warming.

GHGs are primarily released through the burning of fossil fuels. The combustion of substances like coal, oil, and natural gas for electricity generation, transportation, and industrial processes emit large amounts of carbon dioxide. Due to their consumption of energy for lighting, heating, and other uses, buildings have a direct relationship with GHG concentration.

Suggested Steps for Reducing Greenhouse Gas Emissions:

1. Install on-site and off-site renewable sources such as solar panels or wind turbines.

2. Choose eco-friendly or locally sourced materials for construction and renovation projects.

3. Implement waste reduction and recycling programs.

4. Upgrade lighting to LED, install efficient HVAC systems, and improve insulation.

5. Add smart building technologies like sensors and programmable thermostats.

Renewable Energy

Renewable energy is derived from sustainable sources like wind, water, solar, and geothermal power. Engaging in acquisition, generation, and utilization of renewable energy is instrumental in mitigating the environmental repercussions linked to electricity generation for building use. This eco-friendly energy can be harnessed from both on-site installations, such as solar photovoltaic panels, or off-site facilities, including expansive wind turbine farms. Embracing a diverse range of renewable energy sources contributes to the overall reduction of carbon emissions, fostering a more sustainable and resilient landscape for buildings.

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 (RECs)

Renewable Energy Credits (RECs) are financial instruments that represent the benefits of renewable energy generation. Purchasers of RECS can claim environmental benefits like 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 Newmark ESS's Matt Wells for 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.

    o Energy is distributed through existing utility distribution systems.

    o CCAs are authorized in California, Illinois, Massachusetts, New Jersey, New York, Ohio, and Rhode Island.

- For corporate buyers who buy large-scale renewable energy through the grid, the World Resources Institute has created a map of locations and information.

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Green Technology

Battery Storage

Battery storage systems can store excess energy during periods of low demand and release it during times of high demand, contributing to grid stability and reducing the need for additional conventional power generation. Buildings with high peak demand can greatly benefit from this technology.

Battery storage projects require a large amount of up-front capital investment. However, there are multiple methods to implement an economically feasible project:

– Purchase the batteries and own them.

– Engage with third-party ownership entities like energy service companies, independent power producers, and specialized project developers.

– Take advantage of government incentives, grants, and subsidies that support energy storage projects.

Water Bottle Refilling Stations

Water bottle refiling stations reduce the environmental impacts associated with single-use plastic water bottles. Consider installing a water bottle refilling station in common areas such as lobbies, cafeterias, fitness centers, and leasing offices. Retrofit kits utilize the existing water supply, filtration, and refrigeration of fountains. An example of a retrofit kit can be found on the Elkay website.

Smart Windows

Smart windows are one of the newer green technologies that enhance energy efficiency, improve occupant comfort, and increase flexibility in controlling indoor environments. They work by automatically adjusting factors such as light transmission, heat gain, and glare. Like battery storage, smart windows may require a large amount of up-front capital to install.

Electric Vehicle (EV) Charging Stations

Electric vehicle charging stations supply electric power for recharging electric vehicles. Installing these stations may serve as a desirable amenity for tenants in residential buildings and employees in commercial spaces. They add value to the property, attract environmentally conscious occupants, and meet the growing demand for accessible charging infrastructure. Incentives like tax credits, rebates, and grants may be available depending on your location.

Water Conservation

Reducing water usage in buildings brings a range of benefits that extend beyond cost savings. Implementing water-conservation measures reduces the demand on freshwater ecosystems, strengthens the resilience of water resources in communities, and saves energy associated with water pumping, treatment, and heating.

Suggested Steps for Conserving Water:

– 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 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 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.

– Educate building occupants about the importance of water conservation and encourage responsible water-use habits.

– Reuse water that would otherwise be discarded:

  – Storm water collected for use on landscaped areas.

  – Wastewater from sinks, showers, and laundry collected for window washing.

The EPA website provides the 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 ESS.

– Properties built prior to 1992 that have not had new toilets installed can use as much as 3.5 to 7 GPF. In contrast, modern toilets use approximately 1.6 GPF.

– A silent leak in toilets can waste hundreds of gallons of water per day.

– Replacing toilets with a GPF rate over 3.5 with a new 1.28 GPF toilet can result in paybacks ranging from two to seven years.

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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.

– Look into whether your municipality allows 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 table below provides the standard and guidelines for efficient water fixtures and is broken out into three categories. Consider installing fixtures that meet the high-efficiency guidelines.

The Energy Policy Act (EPAct) of 1992

The EPAct of 1992 established the first national water efficiency standards for plumbing products, mandating a maximum flush volume for toilets and a maximum flow rate for faucets and showerheads.

High-Efficiency

High-efficiency plumbing standards mandate lower water flow and flush volumes than the federal standard.

EPA Energy Star & WaterSense

WaterSense labeled products meet the EPA's specifications of water efficiency and performance, and are backed by independent, third-party certification.

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 Force

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FIXTURE		STANDARD/GUIDELINE		
		EPACT OF 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 reduce property water usage.

Install Flow Restrictors

– Install aerators at 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 detect whether a toilet stall is occupied and can adjust the flushing mechanism accordingly.

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The toilet will only flush when it is being used, reducing unnecessary water use.

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

Dry Fixtures

Waterless urinals are designed to allow urine to drain away without the need for flushing. They rely on gravity and the shape of the bowl to direct urine into a waste trap.

Irrigation

Opportunities to reduce water waste irrigation:

‒ Adjust the irrigation schedule seasonally to account for changing weather conditions (e.g., use less water during cooler periods).

‒ Consider a drip irrigation system, which delivers water directly to the base of plants.

‒ Evaluate the installation of Smart Controllers.

‒ Check with the local water authority for resources (e.g., Southern Nevada Water Authority, EPA WaterSense).

‒ Convert 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.

‒ 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.

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Waste Management Recycling Programs

Each day, Americans on average generate 4.9 lbs. of solid waste per person (U.S. Environmental Protection Agency, 2018). Thus, 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 follows 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 construction waste resulting from renovation or fit-out work.

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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 materials 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 locations 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.

– 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 – Universal Recycling Ordinance (URO)

Covered commercial and multifamily properties must provide recycling and file an online plan annually between October 1st and February 1st; noncompliance can result in fines up to $2,000 per day.

Portland, OR – Business Recycling Requirement

Businesses must set up recycling that meets the City's standards; noncompliance can result in monthly escalating fines: $200 (1st month), $400 (2nd month), $600 (each month after).

Fairfax, VA – Commercial Recycling Ordinance

Businesses must maintain a recycling program and submit an annual report listing materials and estimated volumes annually between January 1st and March 1st.

San Diego, CA – City Recycling Ordinance

Commercial and residential buildings must separate and recycle mixed recyclables and organic waste materials.

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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 for 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 with the implementation of desk-side recycling only and placing trash containers in tenant common areas. Roll out program for 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 collaborate 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 devices 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.

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Lamps

Many states have enacted regulations restricting the disposal of lamps containing mercury in landfills, including California, New York, Washington, and Massachusetts. Review the following information for 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 follows all local and state regulations.

- Educate property staff about the safe handling, storage, and disposal of compact fluorescent (CFL) bulbs and ensure there is a process for the safe collection, storage, and recycling of mercury-containing lamps.

- Contact lighting suppliers about take-back programs for used lamps or find 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.

- 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," or an event where people gather to exchange items they no longer need or want.

    • 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.

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Construction Waste

Whether due to material overordering or demolition activities, an enormous amount of waste is generated through construction and renovation. Construction and demolition debris generation in the US was over 600 million tons in 2018, accounting for about 23% of the total municipal solid waste generation in the country for that year (U.S. Environmental Protection Agency, 2018).

- Reuse building materials (e.g., doors, hardware, and fixtures) whenever possible.

- Avoid overordering materials.

- Use prefabricated components and modular construction techniques.

- Design structures with deconstruction in mind.

- 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 five 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 carpets 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

Opting for eco-friendly materials lessens the influence on both the occupants and systems within a building, as well as the broader natural surroundings. Sustainable procurement considers not only the environmental and social aspects but also the overall expenses linked to each acquisition.

When deciding on purchases, consider the composition, origin, manufacturing processes, and disposal method of the products in question.

– 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.

– Minimize the number of deliveries to the building.

– Educate occupants and vendors.

– Improve the awareness of sustainability goals associated with the purchase of new products.

– 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 the 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.

– Inquire about "take-back" programs at the purchase of goods such as electronics, lamps, carpets, and ceiling tiles.

<table>
<tr><td>PURCHASE PRODUCTS THAT SATISFY THE FOLLOWING ENVIRONMENTAL CRITERIA:</td></tr>
</table>

– 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.

– 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.

– 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 rapid 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.

– If possible, purchase FSC (Forestry Stewardship Council) certified paper.

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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 it is more durable.

    - Saves the energy, money and packaging it would take to create a new product.

(v3) The LEED for Building Operations + Maintenance: Existing Buildings Reference Guide provides criteria for sustainable purchasing of furniture and other building products

Achieve sustainable purchases of at least 40% of total purchases of furniture (by cost) during the performance period.

Sustainable purchases are those that meet one or more of the following criteria:

- **Contains at least 10%** post-consumer **and/or 20%** pre-consumer material,

- **Contains at least 70%** of material salvaged, refurbished, or reused from offsite or outside the organization,

- **Contains at least 70%** of 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%** of material harvested and processed or extracted and processed within 500 miles of the property,

- **Contains at least 50%** Forest Stewardship Council (FSC) certified wood.

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Supply Chain

Collaborating with suppliers, vendors, and contractors who are dedicated to sustainable practices is a pivotal step in diminishing the broader environmental and social consequences stemming from operational activities. By extending ESG policies to the entire supply chain, businesses not only enhance their commitment to sustainability, but also foster positive changes in the industry.

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
– Sustainable Purchasing Leadership Counsil (SPLC)
– Global Reporting Initiative (GRI)
– The Ecolabel Index is a global directory of ecolabels.
– The International Organization for Standards (ISO) established the 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 (e.g., recycled content, chemical content, disposal program,

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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

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. According to 2022 data, the transportation sector is responsible for around 29% of total greenhouse gas emissions in the US (U.S. Environmental Protection Agency, 2022). Similarly, the transportation sector accounts for 30% of total US energy consumption (U.S. Energy Information Administration, 2023).

UTILIZE THE PROPERTY'S EXISTING COMMUNICATION CHANNELS:
– 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:

– Public transportation options that 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.

– Whether or not there are alternative fuel stations nearby.

  • Check the U.S. Department of Energy Alternative Fuels Data Center and notify tenants of the closest locations.

– The types of mass and shared transit and ride services that operate in the area surrounding the property.

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- 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

Electric vehicle charging stations supply electric power for recharging electric vehicles. Installing these stations may serve as a desirable amenity for tenants in residential buildings and employees in commercial spaces. They add value to the property, attract environmentally conscious occupants, and meet the growing demand for accessible charging infrastructure. Incentives like tax credits, rebates, and grants may be available depending on your location.

Contact Local Transit Authorities

Contact local or regional transportation authorities to educate building occupants about different alternative transportation opportunities.

– 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.

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Resilience

Climate change poses challenges to the resilience of the built environment, impacting infrastructure and communities. To respond to potential risks brought on by extreme weather events, coastal vulnerability, and heat stress, it is advisable that real estate entities create proactive strategies.

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 groups:

CLIMATE RISKS	
TRANSITION RISKS:	**PHYSICAL RISKS:**
Risks related to the *transition* to a lower-carbon economy. - Policy and Legal Risks - Technology Risks - Market Risks - Reputation Risks	Risks related to the *physical* impacts of climate change. - Acute Risks (e.g., cyclones, hurricanes, floods) - Chronic Risks (e.g., sea level rise, heat waves)

Mitigation Of Risks

Transition Risks

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 refer to the benchmarking ordinance section of this reference guide.

Physical Risks

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. 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:

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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 reclaiming 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 building's 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 rain. 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 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:

– Miami	– Minneapolis	– Colima	– Luxor	– Pune
– Washington, DC	– Louisville	– Montevideo	– Belfast	– Jaipur
– Nashville	– Calgary	– Salvador	– Tbilisi	– Seoul
– Seattle	– Toronto	– Guadalajara	– Greater Manchester	– Kyoto
– Atlanta	– Vancouver	– Panama City	– The Hague	– Can Tho
– Honolulu	– Buenos Aires	– Tel Aviv	– Addis Ababa	– Jakarta
– Haiyan	– Yiwu	– Lagos	– Cape Town	– Melaka
	– Nairobi	– Paynesville		

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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 disastrous 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 manage an emergency or natural disaster.

- All property team personnel complete emergency and disaster response training.

- Create checklists 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 (e.g., 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 (e.g., 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 the actions necessary to return the building to normal operations.

- Collaborate 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.

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Health & 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 has also shown productivity increases. Access to services and amenities such as gyms, bicycle storage, and green space encourage 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 well-being certification schemes were introduced in 2020, including WELL's Health-Safety Rating and Fitwel's Viral Response Module, that provides 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 certification schemes address topics such as sanitation procedures, air and water quality management, emergency preparedness, and enhanced stakeholder communication and collaboration.

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Health & 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.

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Biophilic Design

– Include the presence of plants throughout the common areas of the property.

– Collaborate 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.

Hand Hygiene Stations

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

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

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Inventory and Product Management

– Manage inventory of hand hygiene supplies (soap, sanitizer, and paper towels) weekly.

– Restock supplies at all hand hygiene stations to meet demand, at a minimum of once daily.

– Clean sinks, faucets, soap dispensers, towel dispensers, counters, door handles, and countertops twice daily.

– 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 in areas where building occupants are in 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 the 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.

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– Keeping doors open where possible to limit touch points.

Health & Well-Being Green Building Certifications

For Commercial Properties:

CERTIFICATION	OVERVIEW	PHASE
WELL	– 24 Preconditions across ten health and well-being concepts. – Properties are also eligible to pursue points within 100 Optimizations. – Requires a documentation period, on-site verification by an assessor, and ongoing monitoring. – For whole buildings and interior tenant spaces during construction, renovation, or operation. – 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. – The certification process is considerably more in depth and expensive than the other rating systems in the market.	– New Construction Interior Space – Fit Outs – Existing Buildings
fitwel®	– Provides a framework of 70+ strategies across 12 sections to analyze the health impact of a building and its surrounding area on occupants. – Sections include location, access to outdoor spaces, access to utilize stairwells, indoor environments, and access to healthy food, among others. – Requires a documentation period and review period. – Recertification is required every three years.	– New Construction – Existing Buildings
LIVING BUILDING CHALLENGE	– Created by the International Living Future Institute. – Comprised of seven 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.	– New Construction

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	– Projects must meet all assigned imperatives through at least twelve consecutive months of operation.	

Indoor Air Quality Management

The goal of an indoor air quality management program is to prevent the occurrence of indoor air quality (IAQ) problems at a 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 them 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 like major renovations, pest control, 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 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.

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Green Cleaning

The intent of green cleaning in buildings is to protect occupants, assets, and the environment by reducing harmful exposures while maintaining a healthy, high-performing indoor environment.

In practice, that means:

– 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.

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Environmental Criteria: Cleaning Materials & 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% of 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 purposes, 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.

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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:

- 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.

– 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.

– 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).

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Use of Chemical Concentrates from Dispensing Equipment

Environmental Benefits

– Significantly lowers transportation costs between manufacturer and end-user.

– Uses fewer packaging materials.

– Lowers chemical use to obtain same performance.

– Potentially lowers exposure of janitorial personnel to hazardous chemicals.

Ways to Decrease Exposure Hazards

– Properly contain, store, and dispense of chemical concentrates.

– Utilize closed dispensing systems.

• Concentrates sold for manual dilution in buckets or bottles can increase the risk of employee exposure.

– Professionally train (and retain) personnel in the use, maintenance, and disposal of housekeeping chemicals, dispensing equipment, and packaging.

Entryway Systems

Entryway systems at building openings protect the property's flooring systems from excessive wear and tear, deter contaminants and particulate matter from tracking into the building, and lower the risk of slip and fall accidents.

– Install walk-off mats, grills, and/or grates immediately inside each entrance.

• Preferably, mats are at least ten 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.

Collaborating 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.

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Tenant Engagement

Green buildings incorporate many features and that rely on tenant cooperation and involvement for optimal functionality. Energy systems oftentimes hinge on tenants to adjust settings and minimize consumption according to their actions and preferences.

Educate

Educate occupants on how to conserve energy and water and reduce waste.

- Simple behavioral changes can 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 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.

Communication

Publicize any updated sustainability goals, guides, and recommendations. Make it available via company website, bulletin board, or newsletter.

- Keep occupants informed 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 areas(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.

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Community Engagement

Actively involve the people who live, work, and gather around a building to – from early planning to operations – to shape decisions, share benefits, and build long-term stewardship of the building's environmental and social performance.

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 Areas for Tenants and Community Members to Communicate

– 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.

Encourage Community Participation 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.)

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Refrigerant Management

Under the 1987 Montreal Protocol, refrigerants containing chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) are being aggressively phased out because of their high ozone depletion potential (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 continuing to sell systems using R-22.

– R-22 is planned for the complete phase-out by 2030.

– By 2020, R-22 will be illegal to produce, and the service of the HVAC systems will rely on recycled or stockpiled quantities.

– Ensure capital plan includes a replacement system which utilizes R-410a or similar HFC replacements.

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Landscaping

The selection of landscaping materials and maintenance practices impacts a site's water demand and the risk of nonpoint-source pollution to air and water via chemically laden runoff.

Equipment Utilized

– Utilize equipment that reduces noise and air 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 hard scaping).

Selecting Plant Materials

– 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 invasive species and 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 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 the time 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 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 infrastructures.

– 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.

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Pest Control

Pesticides, by design, kill living organisms and therefore pose inherent risks to human health and non-target species.

INTEGRATED PEST MANAGEMENT (IPM):
– 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 supports 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 following activities:

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 bait 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 on the property.

Biodiversity & Wildlife Management

There are plenty of available humane and effective solutions to handle 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 six feet of space on all sides with a sufficient water source nearby.

– 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.

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Exterior Cleaning & Maintenance

Chemicals from cleaning compounds; snow- and ice-melt products; and gasoline, oil, and antifreeze often wash off impervious surfaces into storm drains. That stormwater, typically untreated, discharges to nearby lakes and streams, harming aquatic life and degrading drinking-water sources.

Conventional mowers and blowers are significant sources of air and noise pollution; sustained exposure above 85 decibels can cause hearing loss (U.S. Department of Health & Human Services). Encourage vendors and maintenance staff to adopt the procedures below and consider making these practices explicit requirements in service 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 water and ensure chemicals do not run into the sewer system.

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Vendor Suggestions

– Ask vendor/service providers 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 & Site

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

Roofs & Hardscapes

The materials used for roofs and hardscape areas can affect surrounding outdoor temperatures and a building's cooling load.

– 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 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 include selecting the right roofing material and coating, cost premiums and payback analysis tools. Investigate local building codes and incentives.

Strategies to Reduce the 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 the energy performance of buildings.

– Help manage stormwater.

– Reduce airborne emissions.

– Ease the urban heat island effect.

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Determining Options

To reduce the Heat Island Effect and improve the buildings' energy efficiency, opportunities exist at repair/replacement when selecting: types of roofing, 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 your local 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 the standard black is zero and standard white is one hundred.

• 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 = 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

The LEED rating system recommends the below SRIs for roofing material based on roof slope:		
ROOF TYPE	SLOPE	SRI
LOW-SLOPED ROOF	< 2:12	78
STEEP-SLOPED ROOF	> 2:12	29

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Light Pollution

Excessive, poorly directed outdoor lighting, often called light pollution, can lead to:

– Wasted energy and money.

– Obscured views of the night sky for nearby residents.

– Increased glare that reduces visibility and comfort.

– Disruption of local nocturnal ecosystems.

– Lighting trespass (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 all building personnel to turn off lights in buildings without automated controls.

– Seek to have 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 nineteen states, the District of Columbia, and Puerto Rico have laws in place to reduce light pollution.

– Most states that have enacted dark-sky legislation have done so to promote energy conservation, public safety, aesthetic values, and astronomical research.

– Dark-sky legislation typically requires fully shielded light fixtures that direct light downward.

– Municipalities in several states have adopted light-pollution regulations within their zoning codes.

– Most state laws are limited to outdoor lighting fixtures on state-owned facilities and roadways.

Additional 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.

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