Green Guide

10 STEPS TOWARD SUSTAINABLE BUILDING MANAGEMENT

LaSalle
INVESTMENT MANAGEMENT®

Our commitment to sustainability

As a leading global real estate investment manager, LaSalle Investment Management recognizes the opportunity it has to reduce the environmental impact of the real estate holdings it manages on behalf of its clients. Buildings are responsible for a significant share of CO_2 emissions, electricity usage, water usage, and solid waste. We know that small changes in the operations of our managed properties can have a materially positive impact on the environment. We also recognize that taking financially responsible steps to improve sustainable operational practices at our managed properties not only represents good and responsible corporate citizenship, but is compatible with serving our clients well through additional value-creation in their real estate holdings.

LaSalle is committed to the following Global Sustainability Goals:

Reduce the environmental impact of our business

Reduce the environmental impact of our Clients' Real Estate holdings

Meet or exceed local environmental regulations

Drive thought leadership and innovation on sustainable property investments

Collaborate with clients, tenants, property managers, and other service providers to provide sustainable management of properties

LaSalle's Green Guide is a global version of regional toolkits that we have prepared for our portfolio and asset managers around the world to share with our external property management teams. As a result, the information or practices contained in this document may not be appropriate or feasible in every location. We are sharing it with the real estate community because we believe the practices detailed are important not just in delivering investment performance, but more importantly, in reducing the impact of real estate on the environment. This guide details a variety of low or no-cost sustainable operational best practices which can help reduce energy and water consumption, increase recycling efforts, and effectively reduce the overall carbon footprint of real estate assets. Along with the environmental benefits, we anticipate that a further benefit of these efforts will be reduced operating expenses, and more competitive properties in their respective markets.

LaSalle's GreenGuide is being shared to provoke creative thinking from asset and property managers about our managed assets. While it is not a guide for specific project implementation, it is a directive for careful evaluation of options that could improve environmental stewardship through operational practices. In all of LaSalle's investment decisions, the financial return implications of operational decisions are our first priority and fully evaluated as part of the decision-making process. This guide is not intended to be all-inclusive. Rather, its purpose is to serve as a jumping-off point for getting started on increasing sustainable property operations, and decreasing overall energy consumption and impact on the environment. This guide is intended to be sufficiently high-level to be applicable across all property types, yet specific enough to be actionable. As such, some suggested actions will be applicable to some properties, but not to others, while other suggested practices will apply to all property types. Asset and property managers familiar with individual assets should be able to discern the practices, and operational principles, most relevant to sustainable operations of each property.

LaSalle believes that as tenants increasingly value sustainable property operations in order to lessen impact on the environment, asset and property managers implementing these best practices will reduce the overall impact of real estate on the environment and create a more satisfied tenant base while improving property financial performance.

10 STEPS

We have focused on 10 best practice areas for reducing the environmental impact of our property operations. Each practice provides general best practice guidelines which can be adapted, as appropriate and relevant, to the property-specific needs of each asset. We recognize that lease structures, the size of an asset, required contractual practices, and other items may impact the applicability of some of these best practices.

1. Energy Efficiency
2. Waste Recycling
3. Sustainable Purchasing
4. Green Cleaning
5. Water Conservation
6. Exterior Site Management
7. Preventive Maintenance
8. Tenant Improvements / Renovation
9. Transportation
10. Staff Education

1. Energy Efficiency

Energy efficient operations can result in large short-term and long-term cost savings. Through an analysis of your building's HVAC/electrical systems and current operational practices (also called "retro-commissioning"), you can identify low-cost repairs and operational changes that result in quick energy savings paybacks. Depending on the level of experience of the building engineering staff, some or all of the analysis and repairs can be completed by the building engineering staff. At times, however, the assistance of a well-qualified outside consultant may be required.

As a second step, completing a more detailed energy efficiency audit will identify larger capital improvement projects that can offer even greater potential for energy savings. In some cases incentive programs are available to assist with the analysis, engineering and equipment-replacement costs associated with a retro-commissioning process, or a detailed capital improvement upgrade project. In addition to identifying savings opportunities, these analyses may identify comfort and operational efficiency issues.

Goals

- Reduce energy and utility expenditures
- Maximize equipment life
- Improve occupant comfort and satisfaction
- Reduce carbon emissions

Low-Cost / Easy Implementation Options

Lighting check. Walk the floor. Simply checking to make sure lights are turned off as scheduled – whether manual or automatic – is a no-cost item which may save significant energy. Check, and if necessary, adjust time clock controls for lighting. Communicate the requirement for out of hour cleaners and maintenance to turn off lights when areas are not being used. Remind tenants of the energy saving power of turning off the lights.

HVAC start times. Reduce HVAC hours of operation: reduce start-up and shut-down times for HVAC systems (as lease terms allow). Reduce weekend hours of operation: many tenants may encourage reductions to save energy consumption (as lease terms allow).

Calibrate controls and occupancy sensors. Uncalibrated thermostats, equipment control sensors and occupancy sensors can lead to higher energy usage, accelerated equipment wear and tear, and uncomfortable tenants. A regular calibration and maintenance schedule will allow equipment to run as designed and maximize efficiency. Trend-monitoring with your energy management control system (EMS), or regular checks with stand-alone data loggers can verify that systems are operating efficiently.

Check damper and control valve functionality. Over time, duct systems and hydronic control valves can become sticky, leaky, and out of calibration. These seemingly minor problems can grow into large-scale system inefficiencies that result in high energy use when left unattended. Periodically checking, adjusting and repairing these systems will maximize system performance. An inspection of control system scheduling times may surprise you. In many cases schedules programmed into control systems don't accurately reflect actual facility operating schedules -- either because tenant requirements have changed, or because onetime special event changes were never adjusted back to normal schedules. A simple cross-check of all equipment schedules with actual occupant needs, and a few adjustments, may immediately yield significant savings in annual energy costs. A system should be put into place to make this inspection on a recurring basis, either monthly or quarterly.

Analyze and adjust equipment sequencing. Central plant equipment (boilers, chillers, cooling towers, pumps, hot/cold deck dampers, etc) all work together based on a sequence of operations designated by the original design strategy. Over time, changes in building usage and load profile may require these sequences to be adjusted to maximize efficiency, and minimize conflicting operational patterns. A detailed analysis of these sequences by an experienced analyst may identify numerous opportunities for optimization.

Check steam traps and radiator valves. In many older buildings, heating systems have broken steam trap valves on radiators. Broken steam trap valves result in the loss of large amounts of valuable heat to condensation or to wastewater systems. Systematically checking and repairing each trap improves energy efficiency and occupant comfort.

Seal envelope penetrations to reduce air infiltration. Simple air leaks around all external envelope penetrations (windows, doors, conduits, piping, etc) cause your HVAC system to work harder to heat and cool your space. Detecting these leaks and sealing them with the appropriate material will not only yield energy savings, but will reduce drafts and corresponding comfort complaints. Consider adding a regular resealing program into your preventive maintenance program for all envelope penetrations. Suggested frequency: every 5-10 years.

Initiate power management software on office computer equipment. Most modern desktop computer equipment (CPUs and monitors) can be programmed to power down or "sleep" after a certain period of inactivity. Activating this software and programming it to an individual user's profile can not only save plug load energy, but also reduce the amount of cooling energy required to remove computer waste heat. Encourage tenants to power down computers and printers overnight. A monitor left on overnight uses enough energy to laser-print 800 pages. A photocopier left on overnight wastes enough electricity to make 5,300 copies.

Audit utility bills. Perform a review of monthly utility bills to look for anomalies. Watch for electrical, gas, or water consumption which is unusually high, or has recently increased, which may indicate a problem worth investigating. An unknown leaking water line, or lights left on continually, can have a significant impact on monthly utility consumption. If the tenant is responsible for equipment maintenance, consider sharing ideas with the tenant, and ensure tenant compliance with the maintenance obligations under the lease.

Higher-Cost Energy Retrofit Options

The following is a list of higher-cost energy efficiency options requiring retrofitting work. Asset and property managers should collaborate to evaluate the feasibility of implementing these improvements. Options include the following:

Lighting system retrofits. Perform an internal lamp audit. Incandescent down-lights could be replaced with fluorescent bulbs. Poor lighting design and inefficient fixtures waste energy and increase loads on cooling systems. Advances in ballast, lamp, luminaires, and control technology make it possible to obtain higher quality lighting with significant reductions in energy usage. Some of our properties still contain T-12 lighting fixtures that can readily be converted to T-8, or the newer T-5 fixtures. Garages and emergency stairwells may contain Metal Halide or Sodium Vapor fixtures (frequently burning on a 24 x 7 basis) which could be converted to T-8 fluorescent fixtures. In many cases a lighting retrofit project can pay for itself with the generated energy savings in less than one year. Utility rebate programs where available can accelerate this payback.

Lighting occupancy sensors. Lighting Motion Sensors automatically turn lights off after a pre-set time when there is no activity in a space. Motion sensor upgrades often have a payback of less than two years.

Chiller replacement. Chillers that are close to the end of their life cycle (20-25 years), or are using ozone-depleting refrigerants, may be good candidates for replacement. New chillers have much higher efficiency coefficients and operate better at partial loads, yielding substantial energy savings. Additionally, replacing a chiller can reduce long-term maintenance costs associated with adding refrigerant.

Control system upgrades. Buildings with electro-mechanical or all-pneumatic control systems may be prime candidates for upgrades to direct digital controls (DDC). The installation of a DDC master controller that interfaces with older pneumatic systems is the first step in maximizing HVAC performance and monitoring/ trending capabilities. If the capital expenditure budget allows, the DDC system can be further optimized by replacing valve and damper actuators with DDC components and installing digital space and equipment-monitoring points. Where building codes allow, CO2 sensors in the parking garages can shut down energy-consuming mechanical ventilation systems when not needed at times of low levels of activity.

Motor replacement and variable frequency drives (VFD's). Many older motors greater than 5 horsepower will yield substantial energy savings when replaced with new motor technologies. A qualified engineering consultant can determine whether this type of upgrade project is a cost-effective opportunity for your facility. Variable frequency drives (VFD's) that control motor speed based on partial demands are effective energy-saving devices that may not have been available when the building was originally designed. The payback is typically less than two years. If the tenant is responsible for equipment maintenance, consider sharing ideas with the tenant, and ensure tenant compliance with the maintenance obligations under the lease.

Energy rebate and tax incentive programs. In many countries, states and municipalities incentive programs are available for energy reduction investment which can be very attractive financially. Research what is available in each property's location. Any capital expenditure recommendations should incorporate the effect of incentive programs.

2. Waste Recycling

Recycling takes a product or material at the end of its useful life and turns it into a usable raw material to make another product. By taking products out of the landfill waste stream, your building can save money on its waste disposal fees, and make a positive environmental impact.

Goals

- Minimize waste sent to landfills
- Reduce fees associated with waste disposal
- Identify additional opportunities for collection of recyclable materials currently in the landfill waste stream

Program Components

The establishment of a recycling program is a two-step process. First, the baseline quantities of waste vs. recycling must be determined; and second, a comprehensive recycling program to minimize landfill waste and track program improvements must be implemented. If the property team and the asset manager determine that a recycling program should be evaluated, the full scope of work should be developed and priced.

Determine your baseline. Perform a waste audit in order to identify waste collection practices and potentially recyclable materials in your facility's landfill waste stream. Your waste vendor may be able to provide this service for you. Perform an internal time-and-motion study to determine the best placement for recycle bins based on your facility's occupant behavior. Identify the frequency of waste and recycling pick-ups.

Develop a comprehensive recycling plan. Create a plan to address all aspects of the facility's waste stream and continually reduce the amount of solid waste going to the landfill.

Low-Cost / Easy Implementation Options

Start with the basics. A high-quality recycling program must first ensure that basic recyclable materials are being diverted from the landfill waste stream. A Waste Recycling Program should include the following elements: paper, glass, aluminum, metals, plastics, batteries, fluorescent light bulbs. In office environments, the number one material found in waste receptacles is paper. Coordinate with the tenants to ensure collection boxes for office paper are located at each desk and in every copy room. Working with your tenants and your waste management contractor, consider whether collection boxes for cans and plastic bottles should be placed at individual desks and/or in lunch and break rooms.

Work with your local waste/recycling contractor. Talk with your waste management contractor about the best way to achieve high landfill diversion rates for your recycling program. Some contractors prefer recyclables separated into different collection containers. Others prefer them co-mingled (all recyclables together). Work with your waste management contractor to determine the preferred process to remove recyclables off-site. When hiring a waste/recycling vendor, ensure that they have recycling programs that facilitate cooperation with tenants.

Consider designating a recycling coordinator. Consider assigning to a single person– the recycling coordinator – the task of creating and maintaining a robust recycling program. Consider forming a "Green Team," or property recycling committee comprised of tenant personnel to help champion this effort.

Check with your local municipalities. Many jurisdictions now offer tax rebates, and other incentive programs for implementing recycling programs. The tax incentives for recycling can be significant.

Higher-Cost Implementation Strategies

A more comprehensive recycling program could include creating a system to collect and recycle food scraps, electronics, batteries, fluorescent lamps, and toxic wastes such as unused paints. Think outside the box and explore all options. Tenants and adjacent property owners may be good sources of information and ideas for areas where collaboration can occur.

3. Sustainable Purchasing

Some management companies offer a supplies purchasing program. If there is such a program, green products should be requested. Sustainable procurement and purchasing is a strategy used to ensure products and services used at the property have minimal impacts on the environment. Sustainable purchasing is commonly referred to as Environmentally Preferable Purchasing (EPP). EPP programs look at all aspects of purchasing -- such as human health, packaging, embodied energy, price, recycled content and waste. There are natural synergies between many of the components of a good Sustainable Operations Program. Therefore, some of the items in an effective EPP Program will also be present in your recycling and low-emitting paints, finishes and furnishings programs.

Goals

- Save energy and water
- Select products containing fewer toxic components
- Generate less waste by purchasing goods with reduced packaging and high recycled content
- Save money through lower disposal costs
- Purchase goods, such as electronics, from manufacturers that will accept them back for recycling ("take-back programs").

Guidelines for Developing an EPP Program

Understand what your management company offers to its clients, and assess the ability of your asset to participate in the program. If your management company has such a program, consider developing an EPP Policy for your asset to allow it to participate in the program.

A high-performing EPP policy. This policy will include: Collect baseline data to determine current purchasing practices; Establish criteria for each type of product purchased; Develop a green product database; Meetings with company vendors to learn about alternative product choices; Revisit purchasing data after three months to determine if improvements were made

Ideas for Sustainable Purchasing Targets

Salvaged materials. The most commonly available salvaged and refurbished materials are office furniture, especially chairs and desks, wood cabinetry, metal filing cases, refurbished fax machines and copiers, refurbished toner cartridges

Recycled materials. Consider products that contain at least 30% recycled content, such as office and copier paper, folders and boxes, building materials such as insulation, carpet tile, dry wall and ceiling tiles.

Low-toxicity purchases. Low-mercury fluorescent lamps (below 100 picograms per lumen hour) products containing low levels of Volatile Organic Compounds (VOC), including cleaning products that meet standards such as those for US-based Green Seal: www.greenseal.org (see Green Cleaning section for more details), adhesives, paints, and sealants (see Paints and Finishes section).

Take-Back Program

Talk to vendors about product take-back programs. Share what you learn with tenants if appropriate. Some companies already offer to take back and recycle products such as photocopiers when they've reached the end of their useful lives. This transfers responsibility for recycling from the customer to the company and keeps waste out of landfills.

4. Green Cleaning

Green Cleaning practices use products and processes that reduce or eliminate any negative impact from cleaning on human health and the environment. When bidding cleaning contracts, the property team should ask the potential vendors to explain in detail their supply purchasing programs, employee training programs, and cleaning methodologies. Request a bid which contemplates the strategies outlined below. If the tenant is responsible for cleaning their space consider sharing "green' practices with the tenant. Conventional cleaning products often contain chemicals called Volatile Organic Compounds (VOCs). Implementing green cleaning practices is one simple and low-cost way to reduce VOCs and potentially improve indoor air quality.

Goals

- Improve indoor air quality
- Encourage custodial staff to think and act in a more environmentally-friendly manner
- Improve marketability of buildings to prospective tenants

Low-Cost / Easy Implementation Options

Green cleaning products. Encourage the hiring of vendors who make use of cleaning products that contain low levels of VOCs. Where the property manager buys supplies for use by on-site personnel, please follow the purchasing recommendations contained in this guideline.Green cleaning products typically do not carry any cost premium. They have become essentially cost-neutral due to both increased competition in the green cleaning chemicals market, and to their own efficiency. A smaller quantity of concentrated green cleaner when mixed with water will clean as effectively as a larger quantity of conventional cleaner.

Use green cleaning specific equipment. In most cases green cleaning chemicals are meant to be used with a dilution system provided by the specific chemical supplier. The system mixes a prescribed amount of water with the chemical concentrate to guarantee low-VOC levels. Micro mops and dusting cloths use one quarter less chemical than conventional wet mops, and can be washed and reused. Encourage vendors to use mops (or purchase them if for use by on-site staff) with an ergonomic design to reduce custodial worker fatigue and injuries.

Modify cleaning hours. Consider modifying cleaning hours for common areas to daytime or morning cleaning to enable less cleaning to be done after-hours with lights on. Consider having cleaners turn lights off as they complete a floor during after-hours cleaning. Over the course of a year the energy savings can be considerable.

Use recycled paper products. Disposable paper products, including paper towels, toilet seat covers, and toilet paper, should contain at least 60% recycled content and should be chlorine free. Purchase trashcan / bin liners that contain at least 10% post-consumer recycled content.

Provide walk-off mats. Both inside and outside of all high traffic areas, use walk-off mats to trap dirt and contaminants before they are tracked through the building. Using mats will reduce the amount and intensity of cleaning required in your building. Vacuum mats at least once per day.

Higher-Cost Implementation Options

Consider the benefits of requiring cleaning vendors to use HEPA (highly efficient particulate air filter) vacuums. These will improve the collection and retention of soils and dust, and help improve the indoor air quality.

Training. Because so many buildings use outside cleaning service contractors, it's advantageous to ensure proper training on green cleaning protocols and the chemical dilution system. When bidding a cleaning contract, the property team should ensure the RFP requires that the cleaning service contractors servicing your facility provide training in green cleaning standards, such as the following:

- The benefits of the green cleaning program
- Recommended cleaning procedures and frequencies
- Proper maintenance of waterless urinals (if applicable)
- How to use each cleaning apparatus (vacuums, chemical mixing equipment, etc)
- Ergonomic use of machinery to maximize productivity and reduce operator fatigue, discomfort or injury
- Safety for proper lifting
- Effective recycling: what to recycle, locations of recycling bins, and waste diversion goals
- Purchasing of recycled paper products

5. Water Conservation

We should aim to use water more efficiently without negatively impacting building occupants. This will reduce utility expenditures associated with potable water purchases and wastewater disposal charges.

Goals

- Use water more efficiently without negatively impacting building occupants
- Cut utility expenditures associated with potable water purchases and wastewater disposal charges

Low-Cost/Easy Implementation Options

Conduct a water audit. Check with local water utility to determine if they will perform a free water audit for your building to establish a "baseline" for your building.

Inventory water fixtures. Inventory all fixtures in the building, including taps (kitchen/bath/utility), urinals, toilets and showers. Gather specifications for each fixture and determine if it meets appropriate standards and best practice. Evaluate your fixture inventory to see if it would be cost-effective to retrofit older plumbing valves and/or fixtures with newer models that use less water.

Retrofit existing plumbing valves. Assess viability of retrofitting flush valve kits with lower flow rebuild kits, or dual flush options to increase water efficiency.

Install flow restrictors on taps. Consider installing flow restrictors on taps as a lesser-cost alternative to more costly low-flow lavatory tap replacements.

Improve landscape irrigation practices. When irrigation is necessary, irrigate in the early morning to prevent evaporation. Consider replacing water-intensive ornamental plants with drought tolerant, native or adaptive plantings.

Take advantage of rebates. Check with your local city / county / water district to determine if any rebates are offered for water fixture retrofits.

Higher-Cost Implementation Options

Low or no-flow toilets and urinals. Waterless urinals, low flow urinals, and dual flush (or low-flow) toilets. High efficiency or low-flow lavatory taps, kitchen sink taps, shower heads, and cleaning sink taps. If waterless urinals are installed, ensure that the custodial staff is properly trained on fixture maintenance.

Meter water usage. If they don't currently exist, evaluate installing water meters on the building's main potable water line and on irrigation and chilled water make-up systems.

Use non-potable water for non-potable uses. Evaluate the feasibility of investing in greywater or blackwater filtration systems for use in irrigation and toilet flushing.

Irrigation controls. Current generation automated irrigation controls can detect current evapotranspiration levels so that the system waters only when necessary for plant health. Irrigation controls are a key strategy to prevent over-watering, and reduce water consumption expenditures.

Drip and microsprayer irrigation system. A drip irrigation and microsprayer system directs water to the plants requiring irrigation, and substantially reduces water lost to evaporation.

Conductivity meter and automated controls for the cooling tower. By better controlling the concentration of dissolved solids in the cooling tower water system, water efficiencies required for blow-down can be maximized.

6. Exterior Site Management

Proper management of building exteriors and grounds is key to achieving a more sustainable facility overall. Exterior site management practices should have the lowest possible environmental impact in order to preserve the integrity of the local ecosystem, while working to integrate the building into the surrounding landscape.

Goals

- Reduce use of potable water for landscaping irrigation
- Work with the property manager to reduce environmental toxicity caused by the use of paints, sealants and cleaners on the exterior of the building and on-site property.
- Minimize pesticide and herbicide use and explore options with more natural methods.

Low-Cost/Easy Implementation Options

Irrigation. Adjust watering schedules on automated sprinkler systems to water early in the morning, or instruct landscaping staff to only irrigate in early mornings. Limit irrigation to the amount required for each plant type. Evaluate the most effective irrigation options for new planting areas (i.e., drip or micro-sprayer irrigation systems).

Plantings. When updating landscaping, choose xerophytic plants that are able to survive with little water, native plants, or plants that are highly adaptive to the area. Native and adaptive plants will require less maintenance than ornamentals. Choose trees that provide shade and require little water once established.

Landscape management. Consider composting green waste produced on-site if local law allows, and if the composted materials can be used as mulch on landscape beds to prevent weed growth and provide nutrients to the soil.

Implement a PM system for the irrigation system. Implement a Preventive Maintenance System for the Irrigation System, which would include items such as: logging the irrigation water meter readings to detect leaks, monitoring the hours of operation to minimize the use of water, periodically inspecting the landscape to look for wet areas that may indicate an underground leak, and ensuring that all sprinkler heads target the landscaping (and are not watering the sides of buildings or other impermeable surfaces).

Higher-Cost Implementation Options

Integrated pest management*. Instead of using harmful pesticides and herbicides, consider Integrated Pest Management (IPM) techniques that prioritize source control and low-toxicity mitigation measures to reduce pest infiltration. IPM is an effective and environmentally-sensitive approach to managing pests and minimizing pest damage. Require detail on these options when issuing an RFP for pest control services.

Lower emitting landscaping equipment. Encourage landscape vendors to use electric power tools if available. Schedule maintenance activities so that power tool operation is minimized during employee work hours.

Automated irrigation systems. Purchase systems controlled by a weather station. Landscaping is irrigated only when the weather station notifies the system that evapo-transpiration rates exceed precipitation. Automated, adjustable irrigation will reduce water consumption and produce healthier plants. Investigate system installation to enable grey-water re-use for irrigation where cost-effective.

** Integrated Pest Management - an integrated approach of crop management to solve ecological problems when applied in agriculture.*

7. Preventive Maintenance

Encouraging staff to collaborate and develop performance goals for their buildings over the long term can result in continuing improvements. Preventive maintenance is a schedule of planned maintenance actions aimed at equipment optimization, as well as the prevention of breakdowns and failures. A good preventive maintenance program is designed to preserve and enhance equipment reliability by tuning, repairing and replacing worn components before they actually fail. Maximizing the useful service life of all building systems reduces the amount of total resources required to operate your building, as well as ensures efficient operation and minimized utility consumption.

Goals

- Prevent system breakdowns and failure
- Maximize lifespan of equipment and the building
- Reduce tenant complaints about comfort
- Increase safety and security
- Improve indoor environmental quality

Preventive Maintenance Program Components

The depth of maintenance programs varies in accordance with property type, budget, and team resources. Many of the low-cost strategies suggested here would normally be included in the annual operating budget. Be prepared to detail the scope, cost, and savings to be produced by the PM program.

Low-Cost/Easy Implementation Options

Create a detailed PM plan. Having a PM plan in place allows for regularly scheduled maintenance on mechanical equipment and minimizes the amount of system down time. A PM plan -- including a detailed work order system -- allows staff to become familiar with equipment, controls, and establishes a regular inspection and maintenance protocol.

Checks to be included in the PM plan. Fire safety system and extinguishers, HVAC coil cleanliness, Plumbing valves and fixtures, Belts and bearings, Windows and screens, Motor rotations and lubrication, Damper function, System calibration, Building envelope, Condensate pan cleanliness, Any additional PM measures as may be required on a property-specific, and equipment-specific basis

Building basics. It is expected that all property management staff tasked with equipment maintenance will be trained in the basics of all building MEP (Mechanical/Electrical/Plumbing) systems and operations -- boilers (including the blow-down process), motors, heat pumps, chillers, cooling towers, fans, dampers, VAV and CV systems, control systems, etc., -- as well as the safe operation, employee safety regulations, and emergency procedures associated with those systems.

Fundamentals of commissioning. Commissioning ensures that all building systems are installed correctly and performing according to the design intent. Optimizing energy use through commissioning can produce significant energy savings (frequently 5-15%), and will reduce operating costs.

Benchmark for "good practice" indoor air quality. A variety of local and national guidelines are available for cleanliness, comfort, and control of pollutants. There are also standards available for the control of HVAC pressure flows, proper cleaning of equipment, capture and exhaust point sources (copier rooms, custodial closets, etc). Be aware of exterior and interior pollutant sources that may be property-specific.

Ventilation guidelines. Find the ventilation guidelines for your country. It is important to recognize that the ability to comply with any standard will be HVAC system-dependent. A standard's goal is to provide building occupants with adequate outside air and ventilation rates.

Proper drying guidelines. After any water leaks, follow proper drying guidelines immediately to prevent biological growth. Have emergency contact numbers for drying services pending significant leaks.

Refrigerant management. Keep a log of all maintenance performed on refrigeration equipment containing more than 50 lbs / 22.7 kg of refrigerant. Track the amount of refrigerant added, and determine the estimated annual leakage rate. If the annual leakage rate exceeds 3% of the total refrigerant charge, identify and repair all leaks and/or consider replacement, depending on age.

Outside air. Calculate fresh air intake to assure proper minimum per applicable local standards. Mke sure that the outside air intake is not located near pollutant sources such as automobile/truck fumes, kitchen and toilet exhaust, and cooling towers, etc. Where possible, utilize appropriate size filters on exterior air intakes and on return air grilles.

Smoking. Where feasible, the building rules should not allow smoking inside the building. All exterior designated smoking areas should be located at least 20 feet / 6 metres from all building entrances and air intakes.

8. Improvements / Renovations

Indoor air quality can be improved below existing compliant levels by using green products during building improvement and renovation projects. The materials can include low-toxicity adhesives, sealants, caulk, mastics, paints, clear finishes, insulation, flooring, systems furniture and seating.

Goals

- Improve Indoor Air Quality
- Reduce environmental impact from the use of toxic materials
- Reduce natural resource depletion through re-use of recyclable materials (carpet, metals, etc.)

Low-Cost/Easy Implementation Options

In those situations where the Landlord controls the build-out and product selection, consider using the following guidelines when selecting adhesives, sealants, insulation, paints and primers. If the tenant is in control of product selection, educate the tenant about these options where possible.

Local sourcing. As a guiding principle, selection of local materials and products will save on transportation costs and energy consumption, and should be considered where economics and practical considerations allow.

Adhesives and sealants. Low-toxicity adhesives are available for installing all building materials, including ceramic tile, linoleum, vinyl flooring, carpet base, wall coverings and countertops. Use adhesives that meet the Volatile Organic Compound (VOC) limits as set by local regulations or international standards for carpet, seam sealer, tile, flooring, cove base, countertop, framing, and panel adhesives. Consider low-toxicity, water-based siliconized acrylic caulk (painter's caulk) for interior moisture and air sealing. Consider low-toxicity mastic for sealing HVAC ductwork. Use low-VOC water-proofing sealants for any applications within the building's vapor barrier system

Insulation. Blanket insulation with no added urea-formaldehyde should be selected when possible.

Paints and primers. Specify paints and primers that meet the local emission and chemical component requirements and standards:

Recycle demolished materials. Diversion of construction materials. Once building rules and regulations are in place, and contractors apprised (and where local law and custom allow), recycling of demolished materials can be done with little additional effort at minimal or no additional cost. Typical recycled materials would include ceiling tiles, carpet, dry wall, and metal studs. In addition to demolished materials, all general construction debris should be included in the recycling program.

Limiting impact of construction on occupied areas. Adequate method statements should be put in place prior to commencing work in occupied buildings to minimize the impact of noise, vibration, dust and other disturbances within the building.

Higher-Cost Implementation Options

Systems furniture and seating. Low-toxicity systems furniture and seating options are available. Avoid vinyl and virgin polyester textiles. Consider reuse of existing furniture where feasible and appropriate.

Carpets and carpet padding. Specify carpet that complies with local carpet standards, or choose natural fibers such as wool and jute.

Non-carpet flooring. Where reasonable, specify low-VOC or rapidly renewable alternatives to vinyl composition flooring, including Linoleum. Made from natural materials including ground cork, limestone, pigment and linseed oil, it does not release any petroleum-based harmful or irritating chemicals. Hardwood flooring with Forest Steward Council (FSC)-certified wood. Engineered flooring systems with no added urea-formaldehyde in their glue or resins, Flooring systems composed of rapidly renewable resources. As an example, bamboo is durable and rapidly renewable. (It grows quickly and has short harvest cycles.)

Built-in cabinets and shelving. Where possible, specify cabinets made from composite wood products that contain no added urea-formaldehyde for built-in cabinets and shelving. Specify wheatboard, formaldehyde-free MDF (Medium Density Fiberboard) or plywood for cabinets, storage systems and shelving.

9. Transportation

Transportation accounts for a significant portion of total energy consumption. Various transit options, including bus, light rail, heavy rail, subway, car pooling, shuttles, telecommuting, walking or biking are available to reduce single-occupancy trips.

Goals

- Provide information to tenants that will help them access available services to help reduce greenhouse gas emissions and air pollution associated with work-related travel and employee commuting.

Transportation Program Ideas

The property team should research transportation programs available in your community, and provide information to tenants on the programs. Check with business improvement district leadership for programs available to building owners in the area (i.e., clean air campaigns, shuttle services, etc.). Provide information to tenants on car pool, car-share, and van pool services provided by the community. Install secured bicycle parking to encourage biking to work.

Encourage alternatives. Consider providing preferred parking spaces to tenants who drive Partial Zero Emissions Vehicles (PZEV), or Zero Emissions Vehicles (ZEV), or alternatively-fueled cars such as hybrids, bio-diesel and ethanol. Educate tenants on the alternative transportation programs offered by the local transportation authority.

10. Staff Education

Operating a building at its optimal performance requires property management teams that are well-trained -- not only in operations and maintenance -- but in energy efficiency and sustainable practices. A comprehensive operations strategy that provides continuing education to staff will reward a facility with better performance, proactive (rather than reactive) maintenance, and is likely to provide for better tenant comfort and retention rates. When selecting property management companies, inquire about the property manager's staff education policy and practice with respect to sustainable property operations.

Goals

- Hire property management companies with a commitment to providing on-site and/or off-site training for building maintenance staff to ensure ongoing education in best practices and the latest technology.
- Target training in focused areas to include energy efficiency, preventive maintenance, water efficiency, indoor air quality, and commissioning

Recommended Educational Topics

Utility fundamentals and building data analysis. Property engineers and management teams should understand the different building fuel types and common units of energy measurement (BTU, therm, kW, kWh, gallon) in order to accurately read utility bills. Understand demand versus consumption. Staff should learn the basics of energy accounting, as this will help them assess next steps required to develop energy conservation projects. Staff should be able to analyze building energy usage trends in terms of base loads and seasonal load changes from different HVAC system components. Understanding trends helps identify system problems and enables targeted development of energy conservation projects. Staff should understand your utility billing rate. Talk to your utility provider to determine if there is a better rate for your usage pattern.

HVAC and control systems. Develop a better understanding of building system components, sequence of operations, analysis/ troubleshooting capability, and proactive maintenance strategies.

Lighting. Lighting is the "low-hanging fruit" in any commercial building's attempt at maximizing energy efficiency. Lighting upgrade projects are relatively quick and easy and yield high returns on investment. Ensure your staff becomes educated on the cost-benefits of lighting upgrade projects, and that they research any local incentives (tax, rebates, etc.) which may lessen economic investment. Staff should understand that lighting alone can account for 20-40% of commercial building energy costs. Installed lighting should have good color rendering, and utilize energy saving technologies such as occupancy sensors, photo sensors and timers that save energy.

Energy codes. Staff should be familiar with the national and local energy codes that apply.

Tenant education. Inform and educate your tenants about recycling, energy reduction, and other sustainable practices you are implementing in their building. Not only are they likely to appreciate efforts to lessen the environmental impact of the building operations, but are also much more likely to give their "buy-in" to ensure the mutual success of these programs.

Recommendations

Share best practices with other property locations and team members. Share your successes! Attend lectures on other local green operations/buildings in the area. Take tours of similar buildings implementing sustainable practices.

What should you do now? BE PROACTIVE.

Sustainability practices are constantly evolving. Share best practices!

Get started with your team evaluating the applicability of these *10 Steps Toward Sustainabile Building Management* in your organization.

Develop a sustainability action plan with payback analysis. Identify items for near and longer term objectives, investigate costs and paybacks, and assign responsibility for action items.

Create an action plan for implementation of best practices and track your progress.

Coach your marketing teams to promote the green and energy efficient features of your properties. If your property has sustainable operations, take initiative to promote these green distinctions to existing and prospective tenants.

Reach out to a local sustainability consultant to implement a program. Leading property management firms such as Jones Lang LaSalle have expert teams to guide sustainability improvement programs and certifications.

www.lasalle.com/sustainability