BOMA International

30 EASY WAYS TO SAVE ENERGY
For Little or No Cost

Energy efficiency is easy—and doesn't require significant capital expenditures to make a big difference in your operating expenses. Use this checklist compiled from the BOMA Energy Efficiency Program (BEEP) education series to make sure that you're saving all you can. Start with the lowest cost efforts and use cumulative dollars saved to invest in larger improvements.

The U.S. Environmental Protection Agency (EPA) estimates that our industry can reduce energy usage by up to 30 percent simply by improving building operating standards. If a 1 million square foot portfolio can reduce its energy consumption by just 10 percent it would mean a potential $2.5 million in asset value increase. Use the checklist below and make a positive impact on our environment and your bottom line.

EFFECTIVE OPERATIONS AND MAINTENANCE

Use these tips to conserve energy and help increase the useful life of building systems and equipment reliability, reducing the need for unscheduled maintenance. Your tenants' comfort levels will also be improved.

☐ **1. Check that Equipment Is Functioning as Designed**
Regularly inspect all equipment and controls to ensure they are functioning as designed. Double-check EMS programming to make sure that operations are optimized. Mini case study: one firm corrected an EMS software programming error from "And" to "Or" and saved $3,700 annually.

☐ **2. Calibrate Thermostats**
Periodically walk through the building and compare the thermostat setting with a hand-held digital thermometer (preferably one measuring to 2 decimal places). Ensure thermostat setting equals actual space temperature.

☐ **3. Adjust Dampers**
Bring in the least amount of outside air necessary to maintain proper air quality. Reduce outside air requirements by adjusting dampers to minimize the need to condition outside air, but be sure to stay within codes requirements.

☐ **4. Consider Your Cleaning Options**
☐ **Team Cleaning**—Janitors go through the building as a team floor by floor, and the lighting is turned on/off as they progress through the building.
☐ **Occupancy Sensors**—Install motion sensors that will turn lights on when janitors are cleaning and automatically turn them off when the floor is vacant. This way, cleaning staff doesn't have to remember.
☐ **Coordinate**—Have janitors coordinate with the security crew to walk through the building and turn off equipment that was inadvertently left on by tenants.
☐ **Day Cleaning**—Why not have the janitors clean during the day while the lights are already on?

ENLIST OCCUPANTS' HELP

Tenants and other building occupants directly impact the three major energy consumption variables in office buildings: plug load, HVAC and lighting. Since many leases require tenants to pay their share of utilities, getting tenants on board with energy savings initiatives should be easy.

☐ 5. Encourage Tenants to Turn Off Equipment

During off hours, make sure to power down everything – such as copiers, kitchen equipment and task lights. Use cleaning/security personnel to turn off miscellaneous items such as coffee pots, kitchen equipment and individual office lights.

☐ 6. Institute an Energy Awareness Program

Create promotional items, post posters, write news releases—tell everyone about your commitment to energy savings. Use your company newsletter and company/building announcements to keep tenants informed about your energy savings goals and how they can both help and benefit. Share these energy savings tips with them.

☐ 7. Encourage Tenants to Use ENERGY STAR® Equipment

Adopt a procurement policy as part of your overall successful energy management strategy and encourage tenants to do the same. ENERGY STAR labeled computers, copiers, external power adapters, fax machines, laptops, monitors, multifunction devices, printers, scanners, water coolers and more. And, when you're finished or ready to upgrade, recycle that equipment.

☐ 8. Install Monitor Power Management Software

In U.S. companies alone, more than $1 billion a year is wasted on electricity for computer monitors that are left on when they shouldn't be. Avoid those wastes by installing power management software for computer monitors and CPU/Hard Drives. These devices allow monitors and CPUs to enter a "sleep" mode when they're not in use.

☐ 9. Harvest Daylight

Locate work stations requiring high illumination adjacent to windows.

☐ 10. Switch Off Overhead and Task Lights when Daylight Is Sufficient

☐ 11. Clean Windows and Skylights

Window and skylight cleaning will allow more natural daylight to illuminate work areas.

☐ 12. Use Work Station Task Lighting

Direct light at areas where tasks are being performed, and use lower wattage for overhead ambient lighting. Consider combining with motion-controlled power strips.

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LIGHTING

Lighting may represent as much as 30 percent of a building's energy usage, so changes to lighting can mean significant energy savings.

13. Change Incandescents to CFL and HID

CFL lights use less energy, have a longer lamp life, and produce less heat, thereby reducing heat load. Also, check the lighting in restrooms, closets, server rooms and some common areas. Thanks to the 2005 Energy Bill, lighting retrofits and upgrades that meet energy efficiency requirements may be tax deductible, up to $.60 psf.

14. Convert T12 to T8 and T5

Re-lamping? Even if you just re-lamped your buildings 3 years ago, take a lighting survey again. Lighting continuously gets more efficient. Converting to more efficient lamps and ballasts saves total building energy.

15. De-Lamp and Disconnect Unused Ballasts

Many buildings are just too bright. Look at bulbs, fixtures and lamps, and see what you can discontinue using. Take a look around at your common areas and tenant spaces. If de-lamping opportunities exist, you may be able to go from 4 lamps in perimeter down to 2 lamps and from 4 lamps to 3 lamps in interior spaces. Be sure that you also disconnect the unused ballasts. And, talk to your tenants before you de-lamp—don't do it without their consent. The end result may be everybody is saving.

16. Verify Performance of Full Floor Lighting Sweeps

Program and periodically verify that the EMS system is performing full floor lighting sweeps. During construction, some building lights may be hard-wired to the "on" position, meaning that EMS-programmed lighting sweeps will not turn off the lights. If this is the case, make the adjustment so it is not hard-wired on in a permanent position. Some building managers recommend staying at work late one night a month or driving past the building after hours to ensure that the programmed lighting sweep is actually taking place.

17. Install Occupancy Sensors

Install occupancy sensors to automatically turn off lights when physical movement stops. This strategy may be especially effective in spaces that are used infrequently, such as storerooms and conference rooms. Occupancy sensors work not just for lights but also for HVAC controls.

18. Use High Efficiency LED Exit Signs

Replace inefficient exit signs with high efficiency LED exit signs. LED exit signs operate 24/7 and have lower maintenance costs due to their extended life.

19. Install Timer Controls or Photocells for Exterior Lighting

You probably have some kind of timer controls or photocells on your exterior lighting. But re-examine how the exterior lighting is actually being used. Make sure that timer controls are functioning properly. Consider sequencing when the lighting in certain areas comes on and off, with tenant safety and security uppermost in your mind.

CONTROLS

Building controls represent another opportunity for energy efficiency improvements. Consider these options.

20. Adjust Temperature

Physically walk through the building and talk with tenants to determine if the actual temperature is comfortable. Make sure that the temperature you have in the building is what tenants need. Re-examine what was contracted for in the lease—it may be too cold or too hot for the tenants' comfort.

21. Set for Lowest Amount of Dehumidification when the Building Is Unoccupied and Raise the Indoor Thermostat Setting During the Cooling Season

Has anyone walked into an office during the summer and felt cold? Summer clothing is typically lighter, thereby requiring less AC to keep the tenants comfortable. Conversely, winter clothing is heavier, thereby requiring less heat to keep the tenants comfortable. In addition, you should be able to reduce thermostats by a minimum of 10° F at night, or weekends and holidays during the heating season.

22. Evaluate After Hours Usage

Are you conditioning space when no one is there? Talk to the tenants to learn if they are actually using their space during the lease-required operating hours. Do they really need the air until 7:00 p.m.? Or on weekends? Adjust building operating hours to reflect actual tenant usage.

23. Adjust Ventilation

Reduce exhaust and outdoor-air ventilation rates within codes. Take a look at the fans and adjust ventilation in unoccupied and low-density areas to reduce the ventilation to a practical, yet comfortable level. Where code permits, close outdoor air dampers during the first and last hours of occupancy to permit fast warm-up and cool-down. Regularly inspect and repair ventilation equipment. Be sure dampers have proper seals and adjust to ensure complete closure.

24. Limit Access to Thermostats

Tenants typically feel that they should have access to the thermostats since they are paying for the energy, but it's not uncommon for people to adjust thermostats too wildly. If they feel cold, they will move the thermostat from 72° to 85° or conversely, if they feel hot, they will move the thermostat from 72° to 50°. Their goal is to change the temperature quickly. Your job is to protect the thermostats from unauthorized adjustment. Consider using EMS controls, tamper-proof locking covers on thermostats, or locking screws to prevent tampering.

25. Plan for Seasonal Weather Changes

Consider a lower set point in the winter months and a higher set point in the summer months, if your system will allow it. Temperatures in the cooling season need to be different from temperatures in the heating season. If you set the thermostats at 70° in the winter, you won't want to set the thermostat at 70° in the summer.

26. Optimize Start-Up Time and Equipment Sequencing

Start up, staging and sequencing deal with when in the day your equipment is turning on and how many pieces of equipment are turning on at the same time. If every piece of equipment in the building is firing up at 8:00 a.m., your peak demand will be much higher than if you begin at 7:45 a.m. and bring your equipment online in a sequential manner over the next half-hour or so. Experiment to determine the latest possible start up time.

☐ **27. Coast the Last Hour of Operations**
Experiment to determine the EARLIEST possible time the systems can be powered down while maintaining comfort. Take note of when people leave your building. You may be able to turn off heating and cooling during the last hour of occupancy, but be sure to maintain ventilation rates within code. Keep in mind that the outside air temperature changes toward the end of the workday. For example, during cooling degree days, the outside air may be a few degrees cooler than it is at noon. Experiment to see when you can turn the systems off. The time may be different on Fridays, for example, if people leave early for the weekend.

EQUIPMENT

Installing or upgrading equipment carries a cost, but the savings can be tremendous. Consider these options with short payback periods and high returns.

☐ **28. Install Variable Frequency Drives and Variable Air Volume Systems**
Motors and fans may not need to run at full speed at all times, due to varying levels of demand placed on the system at different points throughout the day.

☐ **29. Install Heat Recovery Equipment**
Install heat recovery equipment (enthalpy wheels, heat pipes) to optimize conditioning of ventilated air. The goal is to optimize the conditioning of ventilated air by recovering heat that is being produced by other heat producing equipment in the building. ENTHALPY wheels transfer heat and humidity between the exhaust and supply air. Their net effect is to bring the supply (incoming) air closer in temperature and humidity to the exhaust air and reduce the load on the heating and cooling systems.

☐ **30. Relocate Thermostats to Optimal Locations**
Install or relocate thermostats near return air ducts. Locate thermostats in a place that will give you the readings that you want to send to your HVAC system. Thermostats, though often originally located in optimal locations, because of tenant improvements and a variety of other changes to the building over time, end up in less than optimal locations. Evaluate the locations of your thermostats and relocate if necessary.

BENCHMARK AND SHARE

The EPA's ENERGY STAR Portfolio Manager is an essential tool for setting and reaching performance goals for your buildings. Once you benchmark you can share your data with BOMA International and support the industry by helping BOMA to better focus its advocacy, education and recognition efforts. Become an energy leader—benchmark and share.

Use ENERGY STAR Portfolio Manager To Track Your Energy Savings

Go to http://energystar.gov/benchmark and login to Portfolio Manager. If you do not already have a user account in Portfolio Manager, click the New User link on the Portfolio Manager login page and follow the instructions.

Enter your buildings' information and begin tracking energy performance with Portfolio Manager. For more information on how to use Portfolio Manager, take the BEEP Class: How to Benchmark Energy Performance.

Share Your Facilities With Boma International

Step 1	From the My Portfolio page, choose "Share Facilities."
Step 2	From the drop down menu labeled "Select a Portfolio Manager Master Account", look for BOMA International-BOMABEEP and select it from the Master Account Registry. Click CONTINUE
Step 3	Select the access role "Read Only" and "No" for all optional rights. Note: Sharing your account with BOMA BEEP will only allow access to your account for you and the BOMA BEEP Account holder, not for others who share with the BOMA BEEP Account.
Step 4	If appropriate, choose the Facility Group within the BOMA BEEP Account. Click CONTINUE
Step 5	Select the Facilities to share with BOMA BEEP. You may select all or some of your facilities to share by checking the box to the left of the facility. Click CONTINUE.
Step 6	Confirm that all access changes are correct. Review the list of facilities shared and access privileges granted. If facilities or access changes are incorrect, you may return to the previous screen(s) by selecting CANCEL. Once you have reviewed the changes, click SAVE.

Remember To Update Your Facility Information

As you input new information for your facility(ies) into Portfolio Manager, the BOMA BEEP Account holder will be able to track the performance of your facility(ies)/portfolio and recognize your successes.

Apply For Recognition From Boma And Epa

Continue to use Portfolio Manager to track your facilities' energy performance and demonstrate improvements over time. Your facility(ies) may be eligible to receive the ENERGY STAR label and other recognition from BOMA International.

The Building Owners and Managers Association (BOMA) International Foundation is an independent, tax-exempt organization (501(c) 3) dedicated to sponsoring and encouraging innovative research and educational activities that advance the commercial real estate industry and profession. The Foundation, in partnership with the U.S. Environmental Protection Agency's ENERGY STAR® program, recently created an innovative operations excellence program to promote low and no-cost strategies for saving energy in commercial buildings. The BOMA Energy Efficiency Program (BEEP) is a three-pronged approach to energy conservation through education, benchmarking and recognition. For more information, go to www.boma.org/TrainingAndEducation/BEEP.

The Building Owners and Managers Association (BOMA) International is an international federation of more than 90 local associations and affiliated organizations. BOMA's 16,500-plus members own or manage more than 9 billion square feet of commercial properties in North America and throughout the world. The mission of BOMA International is to enhance the human, intellectual and physical assets of the commercial real estate industry through advocacy, education, research, standards and information. Founded in 1907, BOMA International celebrates 100 years of commercial real estate in 2007.