Fact Sheet on.... Energy Conservation

Introduction:

This fact sheet provides information related to energy conservation and purchasing renewable energy and carbon offsets. It will be further expanded in the near future to provide additional case studies and further recommendations.

Goals for Energy Conservation and Renewable Energy Purchases:

Publishers and others considering setting goals for reducing climate impacts should aim for the following targets:

- Reduce electricity consumption by 15-30% (as detailed below)
- Purchase renewable energy for 10% to 100% of electricity consumption see http://www.eere.energy.gov/greenpower/markets/certificates.shtml?page=2
- Purchase carbon offsets for 10% to 100% of travel. See http://www.nativeenergy.com/individuals.html

Reducing Energy Consumption:

90-95% of all office energy consumption is used for lighting, heating and cooling, office equipment, water heating, and ventilation. Though the exact allocation will differ depending on the local climate and type of business it almost always falls within the ranges provided below:

Lighting: 27-43%
Heating/Cooling: 16-40%
Office Equipment: 12-20%
Water Heating: 6-12%
Ventilation: 5-9%

Clearly uses that require the most energy present the greatest opportunities for economic and environmental savings. Below are suggested goals for energy reduction in each of the areas outlined above, as well as steps to follow to achieve these goals. Goals described below assume that none of the steps listed have yet been implemented. Savings will vary depending on current energy savings practices.

Lighting Savings Goal:

According to the EPA's Green Lighting Program, implementing the steps outlined below results in a 48% reduction in energy consumption on average for lighting (or 13% to 21% of all energy consumption), and thus a goal of reducing lighting energy to about one-half of current levels is a reasonable target.

How to Get There:

•Replace incandescent bulbs with compact fluorescent bulbs. They use about 66% less energy, and can save $40.00-$60.00 per bulb over their lifetime.

•Replace T12 fluorescent lights with T8 or T5 fluorescent lights. This requires installing new fixtures but can reduce the energy needs for each bulb by half.

•Use task lighting. If most of the work in a large room is done at one desk, a small lamp can provide most of the necessary lighting.

•Install timers or motion sensors, so lights turn off in unoccupied rooms.

•Make the most of natural light. Use less lighting near windows. Consider painting walls a lighter color and moving furniture so that workspace is near windows.

•Remove unnecessary lighting. Hallways, storage rooms and areas near windows often receive more light than is necessary.

•Make sure lighting fixtures are clean. Dust can reduce light output by up to 30%. Cleaning fixtures regularly may reduce the need for additional fixtures or lamps.

•Use Light Emitting Diode (LED) exit signs. Exit signs using LEDs use less than 10% of the energy of traditional bulbs, and last for 10 years. They will pay for themselves in 3 months to 4 years.

•Use efficient compact fluorescent lights, or high pressure sodium lamps for exterior lighting (special compact florescent lights are required for outdoor use if temperatures drop below 40 ^{o}F). Make sure exterior lighting is turned off during the day.

Heating/Cooling/Ventilation Savings Goal:

Simply changing thermostat adjustments during the day can result in a 20% reduction in heating and cooling costs, so a **reduction of 35-45% (or 8 to 40% of total energy consumption)** should be possible by following all the recommendations below. If you own the building, or can encourage the landlord to upgrade the Heating, Ventilation and Air Conditioning (HVAC) system much larger savings will be possible.

How to get there:

•Adjust the thermostat so that the heat comes on when the temperature falls below 65 ^{o}F and the air conditioning kicks in at 76 ^{o}F. This alone can save up to 20% in heating and cooling costs.

•Don't heat areas that don't need heating. Turn down the heat in storage areas and corridors where people don't spend much time. If there are parts of the building where a lot of physically demanding work is done (i.e. loading/unloading boxes), workers may prefer that the heat is turned down there as well.

•Installing energy efficient windows can reduce heating/cooling costs by 15%.

•Ensuring that the thermostat is not in a drafty area will prevent the heating/cooling system from working harder than it needs to.

•Keep furniture clear of vents and radiators to ensure proper circulation.

•Use an Energy Star approved Heating Ventilating and Air Conditioning (HVAC) System. About 25% of rooftop HVAC units are oversized and therefore use more energy than necessary. Upgrading to a more efficient HVAC system that is the appropriate size can reduce energy use by up to 40%. This can save $3.00-$4.00 per square foot of office space over the lifetime of the system.

Office Equipment Savings Goal:

The savings here can be quite large. Following the steps below can result in a 30%-75% savings in electricity used for office equipment.

How to Get There:

•Adjust power settings on computers. Setting computers to go into sleep mode when they are not used for a period of several minutes can save $25-$75 per year per computer.

•Turn off computers at night. It is best to totally shut down a computer at night. Screensavers protect the screen from damage but do not save energy.

•A computer that is properly managed will use 75% less energy.

•Use power strips. Many electronics still use power even when they are turned off. Some electronics use as much as 20 watts. By plugging computers and other electronics into a power strip with an on/off switch, you can have the effect of unplugging many devices at once with the flick of a switch.

•Use computers, faxes, printers, etc with an energy star label. They can use 30%-75% less energy than non-Energy Star equipment.

A power strip like the one shown here can save energy by preventing electronics that are off or in standby mode from draining energy. Simply turn it off when you leave for the day and it has the effect of unplugging all devices that are conneted to it.

•When possible buy/use laptops, ink jet printers, and flatscreen monitors. They use less electricity than desktops, laser printers and standard monitors. Laptops can use 90% less energy than a desktop!

Renewable Energy:

While it is possible to greatly reduce energy consumption, eliminating it all together it virtually impossible. A great way to reduce the environmental impacts of the energy you do use is to purchase renewable energy credits (RECs). Purchasing RECs is in essence purchasing the environmental benefits that

result from energy produced using wind, solar, or other forms of renewable energy. The cost of RECs will vary depending on a number of factors including the source of the renewable energy generated, but usually falls within the range of 1.5-5 cents per kilowatt-hour. Though the actual electricity delivered to the customer may not have been produced from renewable sources, the purchase of the RECs funds the continuing development of renewable energy and has the effect of offsetting the emissions of the energy used. For information about purchasing renewable energy credits see http://www.eere.energy.gov/greenpower/markets/certificates.shtml?page=2

Case Studies:

Stairwell Lights in Verizon Office building:
A Verizon office building in Valhalla, New York upgraded the lighting system in four stairwells. By installing occupancy sensors and T8 fluorescent lights in 64 fixtures they were able to improve the quality of the lighting and conserve 25% of the energy used to light stairwells and an estimated $4,300 each year. For details see http://nyserda.org/SCLP2/pdf/Stairwaylighting%20FINAL%202-10-06.pdf

Green Lighting for the San Diego County
The County of San Diego was able to replace 95% of its lighting with compact fluorescent bulbs or T8 lamps. Exit signs were retrofitted to use LEDs. At 82% completion the project cost was $1.4 million but annual savings are expected to be $1.12 million. For more information see http://www.nyc.gov/html/nycwasteless/html/at_agencies/govt_case_studies_energy.shtml#1

Loughran & Corbett Attorneys, Inc.
A 3,500 square foot office building in Watertown, MA was able to replace its incandescent bulbs with compact fluorescent bulbs and replaced old T12 fixtures with T8 fluorescent lighting. The total cost of purchasing and installing the new equipment was $6,152 and the projected annual savings in energy costs are $1,740. The new lighting system will pay for itself in about 3.5 years. For details see http://www.designlights.org/downloads/75%20N%20Beacon%20St.%20DLC.pdf

Renewable energy credits can offset the impacts of an office's energy use by supporting the development of renewable energy.

Additional Resources

Flex Your Power: http://www.fypower.org/bpg/index.html?b=offices

Energy Star: http://www.energystar.gov/index.cfm?c=business.bus_index

Alliance to Save Energy: http://www.ase.org