

A program sponsored by the City of New York Department of Sanitation, the New York State Energy Research and Development Authority, and the U.S. Environmental Protection Agency Region II

Premier Issue

This is the premier issue of *NYC WasteLe\$\$*, your information source on reducing costs through improved efficiency. You can rely on this waste reduction and energy conservation quarterly to keep you informed of important developments and cost saving opportunities for the retail industry.

NYC WasteLe\$\$ is a non-regulatory waste prevention program initiated by the New York City Department of Sanitation (DOS) with support from the New York State Energy Research and Development Authority (NYSERDA) and the U.S. Environmental Protection Agency (EPA) Region II. *NYC WasteLe\$\$* supports City waste prevention efforts to help local businesses maintain and enhance their competitiveness.

The *NYC WasteLe\$\$* program has targeted nine business and institutional sectors, including restaurants; retail food establishments; manufacturers; wholesalers; retailers; schools; airlines/airports; stadiums, arenas and convention centers; and hospitals. The results of the program are showcased in these newsletters and at the upcoming Retail Seminar on June 29, 1999. For more information about the seminar, contact Jennifer Pezzillo at (800) 729-4210. In addition, the *NYC WasteLe\$\$* web page will be on-line soon. ■

Selecting the Right Light



Compact fluorescent lamps come in a variety of sizes and styles to fit most existing fixtures.

When selecting a lighting system for your facility, you want one that is appropriate to your setting, comfortable for your patrons and employees, and cost effective. This article will help to "shed light" on some of your lighting options. Quantity and quality of light, as well as energy efficiency, must be considered before selecting a

lighting system. According to the U.S. EPA Green Lights program, businesses tend to overlight. Spaces often are designed for as much as 200 footcandles of light when 50 footcandles may not only be adequate, but may actually be superior in terms of comfort and productivity. Overlighting will not only cost more, but may wash out displays and create an uncomfortable atmosphere.

In addition to quantity, consider the quality of the light. In general, cooler light sources create an atmosphere that implies efficiency and may be most appropriate for administrative areas of a store. Warmer sources may be used in fitting rooms.

Energy efficiency is another important consideration when choosing lighting. The four basic categories of lighting from which you can select — incandescent, halogen, high intensity discharge and fluorescent (standard and compact) — offer different levels of efficiency for different purposes. Incandescent bulbs are most commonly used in households, but are still found in many commercial applications, even though they are the most inefficient, with almost 90 percent of the energy used being released as heat rather than light. Incandescent offer the shortest lifes-

New Development Cuts Cost of Lighting Exit Signs

Exit signs — they are everywhere and they are a necessary part of every business. Depending on the size of your facility, you may have a handful or you may have hundreds.

No matter the number, exit signs must be illuminated 24 hours a day, 365 days a year, providing necessary direction during emergencies, and always using electricity.

LEDs, or light-emitting diodes, are the lights that illuminate your digital clock radio and stereo. They are the wave of the future, lighting up

everything from exit signs to traffic lights, while using only a small amount of electricity for the amount of light they emit.

Overall, LED exit signs are more cost effective, more energy efficient, often more visually appealing than incandescent or compact fluorescent alternatives, and they last longer.

The following table presents a comparison of incandescent, fluorescent, and LED systems.



Extronix Models 600 and 700 are available in both 6" and 8" letters.

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Spotlight On: Energy Efficiency

Next Issue Spotlight On:
Recycling

Time Out and Turn Off: Timers and Occupancy Sensors

At night when you look out at the mosaic light pattern of the City, consider that, although most of the buildings have closed and are unoccupied, the lights are still on. Some lighting is necessary for security, but many businesses lose a considerable amount of money through overlighting. According to information provided by Noritas, Inc., inventors of occupancy sensors, as much as 45 percent of lighting energy is wasted during normal business hours when spaces are unoccupied. Time-based and occupancy sensor controls for lighting offer ways to prevent wasted energy and money.

"In New York City, timers and occupancy sensors are an important way for small to medium sized businesses to control demand charges."

— Don Giampietro, New York City Department of Business Services

The most basic lighting control strategy is a timer. Timers are useful in both outdoor and indoor settings with predictable operating schedules. Typical outdoor situations include parking lot or security lighting. Indoor situations include lighting in production and manufacturing facilities that have predefined operating hours. Timer-based lighting also applies to indoor security and corridor lighting. Control devices range from simple timers to programmable sweep systems that establish a schedule for turning off lights throughout a floor or entire building.

An occupancy sensor determines if a space is occupied using ultrasonic or infrared sensors. When an occupant moves within a passive infrared occupancy sensor's range, the lights turn on. Passive infrared (PIR) sensors require an unobstructed view of the occupant and, therefore, do not work well where partitions may block direct viewing of occupants. However, they do not require an enclosed space and work well outdoors and in high-bay areas.

TIMER-BASED LIGHTING AVERAGE ENERGY SAVINGS

| Applications | Energy Savings (%) |
|-----------------------|--------------------|
| Offices (private) | → 20-25% |
| Offices (open spaces) | → 20-25% |
| Rest Rooms | → 30-75% |
| Corridors | → 30-40% |
| Storage Areas | → 45-65% |
| Meeting Rooms | → 45-65% |
| Conference Rooms | → 45-65% |
| Warehouses | → 50-75% |

Source: U.S. Department of Energy, U.S. Environmental Protection Agency, Electric Power Research Institute

Ultrasonic controls continually emit high frequency sound waves, which bounce off everything in their range. If there is motion within the space, the lights will turn on. If no motion is detected for a fixed period of time, the sensor will switch area lights off. Ultrasonic controls operate best in enclosed areas with hard floors, walls and ceilings. They do not work well outdoors or in high-bay areas.

If turning off the lights completely is impractical, or if your facility uses high-pressure sodium lamps which have long restrike times, "dimming down" the lights may be another energy saving option. L.L. Bean, for example, installed two infrared occupancy sensors in its reserve warehouse. Now the lights are dimmed to 15-40% of their full light output for 70% of the day, when the warehouse is not in use. The cost of the project was \$125,000, but the payback period is less than three years.

Source: U.S. EPA Green Lights Application Profile

A hybrid sensor that incorporates both ultrasonic and infrared technologies is available to cover tricky applications, such as restrooms. In addition, both types of sensors can be set to stay on for any length of time after they are triggered, avoiding problems with lights turning off too often or too quickly.

Energy and cost savings, as well as payback, are dependent on the types of controls used, installation costs and the size of the coverage area. Costs can range from \$30 to \$200 per system. Time-based controls are the least expensive control option and PIRs are usually less expensive than ultrasonic sensors. ■



FOR MORE INFORMATION:

New York City vendors include:

- Leviton Manufacturing Company
59-25 Little Neck Parkway
Little Neck, NY 11362
(800) 323-8920
Fax: (800) 832-9538
Tech Line: (800) 824-3004
- Superior Lamp & Electrical Supply Co., Inc.
934-936 Broadway
New York, NY
(800) 544-4877
Fax: (212) 529-3307

Selecting the Right Light → continued from page 1

pan, approximately 750 hours, and many long-life incandescent bulbs are actually less efficient than standard incandescents.

Halogen lamps are filled with halogen gas, which allows them to produce a brighter, whiter light than standard incandescents. Halogen lamps use between 15 and 70 percent less energy to produce the amount of light generated by standard incandescents, according to the Creative Homeowner Press Energy Efficient Lighting Guide, and can last up to 2,250 hours. Halogen lamps can be used to light public areas or they can be installed in spotlights and floodlights. Some types of halogen lamps require special fixtures. Halogen Infrared (HIR) lamps are even more efficient than tungsten halogen lamps. The Lighting Guide indicates that HIR lamps offer a 40 percent or more efficiency gain over standard halogens, while providing the same amount of light output, beam control and compactness as the standard halogen lamp.



Macy's now uses compact fluorescent lamps in its chandeliers.

Windows Improve Many Aspects of Retail Operations

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High intensity discharge (HID) lamps, including metal halide and high-pressure sodium, are excellent for lighting large areas such as parking lots or building exteriors. Some models also can be used to light offices and building interiors. Metal halide and sodium lamps are the most efficient types of HID lamps, as they are capable of producing over 60 percent more lumens than a mercury vapor lamp of the same wattage, according to the U.S. EPA Green Lights Program Lighting Upgrade Manual.

Among the most energy efficient lighting systems are fluorescent tubes combined with reflectors for overhead lighting, and compact fluorescent lamps for down lighting, spotlighting, and desk lamps.

Fluorescent lamps have long been the standard in commercial overhead lighting, but recent advances in technology provide for more efficient

A typical facility in New York City replacing 50 75-watt incandescent bulbs with 50 20-watt compact fluorescent bulbs would reduce energy use from 45 kilowatt hours per day to 13.2 kilowatt hours per day and, over the course of five years, would save approximately \$5,900 in energy and replacement bulb costs.

Source: Back-to-School software developed by the Center for Renewable and Environmentally Sustainable Technologies

options. In new buildings, the standard includes electronic ballasts and highly efficient T-8 lamps, rather than traditional T-12 lamps. T-8 lamps significantly

reduce overall system wattage while producing more lumens per watt. Even lower wattage T-5 lamps are available for indirect lighting and combination direct/indirect lighting design systems. In addition, Philips has introduced its ALTO™ line of low-mercury fluorescent lamps.

Compact fluorescent lamps (CFLs) can be used in place of standard incandescent bulbs or halogen lamps. CFLs typically fit in a standard incandescent socket, so there are no retrofit costs, and they produce more light per watt. CFLs cost more than traditional incandescents but, because they last at least ten times longer, they pay for themselves in a very short time.

A 20-watt CFL produces the light of a 75-watt incandescent. Typical costs range from about \$12 to \$25, yet the CFL will last from 7,500 to 10,000 hours, compared to about 750 hours for an incandescent bulb. These longer lasting lamps reduce labor costs as well, since they are replaced less often.

Historically, CFLs have not been well suited for retail settings because of their size, the quality of the light and the fact that they could not be dimmed. Today's new product lines are more aesthetically comparable to incandescents and offer dimmable models. Dimmable CFLs, available now from several manufacturers, are suitable for many retail applications that require changes in lighting throughout the day. The lamps are dimmable to between 10 and 20 percent, depending on the brand.

Most of the major manufacturers of CFLs have introduced one-piece CFLs that combine the ballast and lamp. These one-piece designs are simpler to replace and multi-, radial- or spiral-tube designs help to reduce space requirements. The radial design provides a more uniform light distribution, as well. In addition, all of the new designs now use electronic ballasts, which eliminate the flicker and buzz traditionally associated with fluorescent tubes.

The major manufacturers also have recently introduced compact fluorescent bulbs in a traditional globe shape very similar in appearance to standard incandescent bulbs. These bulbs can produce light equivalent to a 60-watt bulb while consuming only 13 watts — a savings of 80 percent over the life of the unit. These globe shaped bulbs are ideal for use in desk, wall, floor and table lamps; recessed cans; coach lights; utility lamps; and torchieres. There are even small 3-watt compact fluorescent bulbs available that are suitable for use in decorative lighting applications such as chandeliers and candelabras.

Dimmable CFLs can be put in any standard incandescent socket, can be used with standard wall dimmers, photosensors, electronic timers and occupancy sensors, and are ideal for use in recessed downlights.

In addition, most of the CFLs now on the market provide light similar to soft white incandescent lamps and are much cooler than incandescents. In many settings, the cooler compact fluorescents also can help to reduce air conditioning costs. ■



FOR MORE INFORMATION :

Vendor Contact Information

- General Electric Lighting
Tel: (800) GE-LAMPS (800-435-2677)
Email info@lighting.ge.com
www.ge.com/lighting
- CFL Lighting Co., Ltd./MXBC, Inc.
Tel: (503) 635-7515
Fax: (503) 635-7437
Email: MXBCINC@worldnet.att.net
- Lights of America
Tel: (800) 321-8100
www.lightsofamerica.com
- Lumatech Corporation
Tel: (800) 932-0637
Fax: (800) 345-5862
www.lumatech.com
- Maxlite, A Division of SK America, Inc.
Tel: (800) 555-5MAX or (973) 256-3330
Fax: (973) 256-9444
- Osram Sylvania
Tel: (978) 777-1900
Fax: (978) 750-2152
www.sylvania.com
- Panasonic
c/o Burgoyne Sales, Inc.
Edison, NJ
Tel: (732) 225-0450
Fax: (732) 225-7454
www.panasonic.com/MHCC/pl/index.html
- Philips
Tel: (800) 326-6586
Fax: (423) 475-0411
www.lighting.philips.com/index.htm
- Technical Consumer Products, Inc. (TCP)
Tel: (800) 324-1496
Fax: (440) 542-5160
Email: sales@yan.com
www.yan.com/main.html



Some retailers use more light fixtures than necessary — overlighting and using excessive amounts of energy.

Windows offer numerous opportunities for reducing energy costs. For example, they can help to reduce lighting costs. Daylighting is a technique used to reduce the need for artificial lighting during daylight hours by increasing the quantity of sunlight that enters a building.

Retailers are beginning to take advantage of this concept. For example, Wal-Mart incorporated the concept of daylighting into a prototype store built several years ago. Skylights were installed in one half of the store's roof. According to the Rocky Mountain Institute and the U.S. Department of Energy, Wal-Mart found that daylighting not only decreased overall lighting costs, but increased sales in the store. According to Tom Seay, Wal-Mart's Vice President for Real Estate, register activity

revealed that "sales per square foot were significantly higher for those departments located in the daylight half of the store." Sales also were higher than the same departments in other stores.

To increase the efficiency of your windows, so that you are not losing heat as you gain light, a wide range of practical and cost-effective solutions are available. Energy efficient features include tints, films and gas fills. For more information, visit the Efficient Windows Collaborative, a part of the U.S. Department of Energy Windows and Glazing Program, at www.efficientwindows.org or the Energy Efficiency and Renewable Energy Network at www.eren.doe.gov, or contact the Energy Efficiency and Renewable Energy Clearinghouse, P.O. Box 3048, Merrifield, VA 22116, at (800) 363-3732. ■

Cut Costs of Exit Signs → continued from page 1

EXIT SIGN LIGHTING

| Type of Lighting | Electricity Cost to Operate One Sign for One Year | Average Unit Lifespan | Annual Maintenance Cost |
|----------------------------------|---|-----------------------|-------------------------|
| Incandescent ¹ | \$35.04 | 6 mos. - 1 yr. | \$24.33 |
| Compact Fluorescent ² | \$10.51 | 3 - 5 years | \$8.33 |
| LED ³ | \$2.45 | 10+ years | \$1.04 |

¹Two 20 W bulbs. ²One 9 W bulb with 3 W adapter. ³One 2.8 W lamp.
 Note: This comparison assumes an energy cost of 10 cents per kWh. Maintenance costs are based on 25 minutes to replace bulbs at \$25/hour. This analysis does not take into consideration the cost of initial installation or replacement bulbs or lamps. Based on information by Astralite, Inc.

When converting to LED signs, you can either replace your exit signs with new LED signs or you can retrofit your existing signs with LED retrofit kits. A typical retrofit kit costs \$25 to \$35, while the cost of a new LED sign ranges from \$30 to \$115 for a single-face sign, or \$50 to \$130 for a standard double-side commercial grade product.

A facility in New York City with 100 exit signs can save more than \$5,500 annually in electricity and labor costs by investing in LED exit signs.

Source: ENERGY STAR® Exit Sign Calculator

The estimated 100 million exit signs in the U.S. consume up to 35 billion kWh of energy annually (the power generated by five large nuclear power plants). Illuminating these signs costs businesses and organizations about \$1 billion annually.

Source: U.S. EPA ENERGY STAR® Exit Sign Program

In the future, and especially in New York City, the retrofit kit may not be a practical option. Underwriters Laboratory may require that the entire sign be UL listed, virtually eliminating retrofit kits. In addition, New York City's exit sign requirements state that signs must have 8-inch letters, while elsewhere in the U.S. laws and codes specify only 6-inch letters. Virtually no retrofit kits are made with 8-inch letters.

Experts warn that although LEDs offer tremendous savings opportunities, there are some factors to consider when purchasing LED exit signs or retrofit kits. For example, some LEDs, particularly commodity-grade LEDs, as opposed to premium LEDs, have been known to fade over time.

"Make sure that the LED you purchase is a high-quality bulb and check to make sure that it carries a minimum warranty of five years, with a guarantee that light levels will meet code requirements for the full five years," says Jennifer Dolin, director of U.S. EPA's ENERGY STAR® Exit Sign program. Also, surge protection should be an integral part of the sign, according to energy consultant Doug Sheppard of Advanced Energy and Lighting, Inc.

Fratallones Ace Hardware retrofitted its five exit signs to LEDs, saving \$165 during the first year. This is a 97% cost savings and includes the avoided purchase and disposal costs of replacement lamps and avoided labor costs.

Source: Minnesota Office of Environmental Assistance

Several companies offer LED exit sign products, including new signs, custom signs, and retrofit kits. LED exit signs are available in matrix, edge-lit, and stencil designs. U.S. EPA has established an ENERGY STAR® Exit Sign program. Exit sign manufacturers who meet the ENERGY STAR® guidelines for new exit signs (the program does not include retrofit kits) can use the ENERGY STAR® label to identify products that are energy efficient and meet visibility and luminance criteria.

Currently, 33 manufacturers have signed up for the program. Access the ENERGY STAR® Exit Sign program at www.epa.gov/exitsigns.html or call 1-888-STAR-YES to receive information about ENERGY STAR® partners. All of the exit signs listed on the Web site meet the ENERGY STAR® guidelines, and some of the manufacturers also produce retrofit kits.

The ENERGY STAR® Web site also offers a useful savings calculation sheet and tips for buying ENERGY STAR® compliant exit signs. Check your local phone book or contact manufacturers to identify LED exit sign vendors in the New York City area. ■

Energy Efficiency Technical Assistance Programs

Technical assistance programs for improving your energy efficiency are available from a variety of sources. Most programs are easy to access and offer free information. You may not have time to develop an energy audit plan for your business or perform hours of research to identify the "brightest" energy efficient lighting and equipment. But, if you want to make simple changes that will save you money and improve the efficiency of your business, consider relying on one or more of the following available resources.

Publications:

- ENERGY STAR® Buildings Upgrade Manual, U.S. EPA, publication number #EPA 430-B-97-024B, July 1997. Call (800) 490-9198 to request a copy.
- Lighting Research Center, Publications, Rensselaer Polytechnic Institute, 110 8th Street, Troy, NY, 12180. For more information: (518) 276-8716.

Hands-On Assistance:

- New York State Energy Research and Development Authority, FlexTech Program. Contact Mark Watson at (518) 862-1090 x3314.
- Energy Cost Savings Program, NYC Department of Business Services, (212) 513-6345/6415.
- Community Environmental Center 43-10 11th Street, Long Island City, NY 11101. Contact Lynn Grace, Director of Administrative Services, at (718) 784-1444.
- Advanced Energy & Lighting, Inc. 23 East 10th Street, Suite 615, New York, NY 10003. Contact Doug Sheppard at (212) 475-5774.

Internet Resources:

- Green Lights Program:
www.epa.gov/greenlights
- ENERGY STAR® Program:
www.epa.gov/energystar
- ENERGY STAR® Buildings:
www.epa.gov/buildings
- ENERGY STAR® Buildings Upgrade Manual:
www.epa.gov/appdstar/buildings/manual
- Energy User News:
www.energyusernews.com
- National Lighting Bureau:
www.nlb.org
- Business Energy Checkup:
www.solstice.crest.org
- UCLA School of Arts & Architecture:
www.aud.ucla.edu/energy-design-tools
- Today's Facility Manager:
www.tfmgr.com
- NYSERDA Systems Benefit Charge programs:
www.nyserda.org/sbc.html

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