

NYC WasteLe\$\$

Issue #

1

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

Airlines / Airports

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 airline/airport 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 upcoming sector-specific seminars. In addition, the *NYC WasteLe\$\$* web page will be on-line soon. ■

Alternative Fuel Vehicles:

Serving Passengers and Saving Money



Alternative fuels, including compressed natural gas (CNG), liquefied natural gas (LNG), electricity, ethanol, methanol, propane and even vegetable oils, are chemically less complex than gasoline and burn "cleaner," with fewer emissions. The use of alternative fuels by commercial

fleets at airports can reduce reliance on petroleum products and improve air quality to comply with increasingly stringent air emission standards. Alternative fuels also are less expensive, reducing total fleet management costs.

In response to the Clean Air Act Amendments, fleet managers are considering converting to alternative fuel vehicles (AFVs). In cities that do not meet Federal air quality requirements, gasolines must be reformulated during certain months when carbon monoxide and ozone pollution are most serious. In 22 metropolitan areas, designated fleet operators are required to use cleaner fuels, and recent amendments require 75 percent of the Federal government's fleet to convert to alternative fuels. Recognizing the growing demand for cleaner alternatives to gasoline and diesel fuels, U.S. auto companies are introducing more AFVs to the market, simplifying fleet conversion. Airlines and their contractors considering the purchase of new ground vehicles can evaluate AFVs as a mechanism to reduce reliance on petroleum products and prepare for regulatory changes that may affect how they comply with air emission standards.

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, and 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.

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

► continued on page 4

► continued on page 3



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Inside Look:

- Premier Issue 1
- Alternative Fuel Vehicles: Serving Passengers and Saving Money. 1
- New Development Cuts Cost of Lighting Exit Signs 1
- Don't Let Your Profits Go Out the Window. 2
- Compact Fluorescents: See Them in a New Light 2
- Energy Efficiency Technical Assistance Programs. 4

Next Issue Spotlight On:
Recycling

Spotlight On: Energy Efficiency

Don't Let Your Profits Go Out The Window

Less than a decade ago, the energy necessary to offset the heat lost and gained through windows cost the U.S. an astonishing \$20 billion dollars per year, according to the U.S. Department of Energy. That is 25 percent of all the energy used to heat or cool homes and businesses in this country. Windows are currently responsible for 15 to 35 percent of all the heat lost or gained in a new building; the percentage can be even greater in older structures, according to the National Center for Appropriate Technology. Another 10 percent of heated or cooled air can be lost through window frames.

What technologies can reduce this energy cost? Today a wide range of practical and cost-effective solutions are available to make windows more energy efficient, including tints, films, and gas fills. With all these options offering significant energy saving benefits, why let your profits go out the window?

WINDOW TECHNOLOGIES

Technology	What Is It?	Benefits	Drawbacks
Low-emissivity (low-e) replacement windows	Windows have a thin layer of silver sandwiched between layers of anti-reflective metal oxide that allows the sunlight to pass through while blocking the heat radiation. The glass is optically invisible. Multi-functional in that it also can be applied to the inner pane of glass in colder climates to reflect heat back indoors.	Can reflect 40% to 70% of the heat normally transmitted through a clear glass window. Offers higher performance than other coatings, with a reduction in damaging UV rays of 60% to 90%. Provides a higher level of light compared to the amount of heat reduction, making it more suitable for climates that require more air conditioning than heating.	Can add 10% to 15% to the price of a double glazed window.
Reflective glass	Reflective material is bonded with glass panes in new windows to reduce light entry. Most commonly used in new construction and window replacement.	The reflective film can block from 16% to 80% of all the solar energy entering the room, depending on the type of coating and the climate. Helps control heat gain in the summer. Reflective nature creates visual barrier from the outside.	Reduces the amount of light entering the room.
Reflective film	Reflective film is placed on new or existing windows to reduce light entry. Most commonly used on existing windows.	The reflective film can block 16% to 80% of solar energy entering the room, depending on type of coating and climate. Helps control heat gain in the summer. Reflective nature creates visual barrier from the outside.	Reduces the amount of light entering the room.
Tinted glass	Tints, such as bronze tint, are applied to glass to reduce solar heat gain. Provides better energy performance on larger windows, making them more suitable for commercial use.	Can survive the elements while reflecting glare and heat and saving up to 40% on air conditioning costs. Tinted glass can eliminate as much as 90% of the incoming solar radiation and light making it ideal for warm regions.	Does not allow as much heat in from sunlight if temperature is cooler. Reduces visible light entering the room.
Tinted coatings	Various shades of coatings applied to glass in new or existing windows to reduce solar heat gain.	The spectrally selective combination coatings can allow various amounts of heat and light in or out and are perfect for climates with both hot and cold seasons.	More susceptible to the elements than other coatings.
Gas-filled windows	Two or more panes of glass with argon or krypton gas sandwiched between them to reduce heat transfer through the glass.	Reduces convection heat loss and can increase the efficiency of a low-e coated window by an additional 15% to 20%. Gas-filled windows reduce heat loss and are, therefore, best for colder climates. Krypton is more effective, although more expensive, than argon.	More expensive than traditional windows. A mixture of argon and krypton is used as a compromise between thermal performance and cost.

Sources: U.S. Department of Energy's Energy Efficiency and Renewable Energy Network, and Efficient Windows Collaborative: Environmental Building News.



FOR MORE INFORMATION:

- **Efficient Windows Collaborative**
U.S. Department of Energy
Windows and Glazing Program
www.efficientwindows.org
- **Energy Efficiency and Renewable Energy Network**
www.eren.doe.gov
- **EnerAction Inc.**
4559 4th Street
La Mesa, CA 91941-5501
(619) 698-8101
www.eneraction.com/skapp/fenspec.htm
- **National Fenestration Rating Council**
1300 Spring Street,
Suite 500
Silver Spring, MD 20910
(301) 589-6372
www.nfrc.org

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



Compact Fluorescents: See Them in a New Light

Replacing incandescent bulbs with compact fluorescent lamps can reduce energy costs, replacement lamp costs, and labor costs. As you improve your bottom line, your customers and employees will enjoy the cool, soft white light emitted by compact fluorescent lamps. Compact fluorescent bulbs (CFs) are small, highly energy efficient light bulbs that can be used in place of standard incandescent or halogen bulbs. CFs typically fit in a standard incandescent socket, so there are no retrofit costs, and they produce more light per watt than conventional bulbs so they save you money on energy costs. CFs do cost more than traditional incandescents but, because they last at least ten times longer, they pay for themselves in a very short time.

A typical facility in New York City replacing 50 75-watt incandescent bulbs with 50 20-watt compact fluorescent lamps 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 lamp costs.

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

New advances have done away with the flickering, humming, slow starts, and poor light traditionally associated with fluorescent lamps. The new generation CFs are smaller, and they come in a variety of shapes and styles suitable for public areas.

A 20-watt CF produces the light of a 75-watt incandescent. Typical costs range from about \$12 to \$25, yet

▶▶ continued on page 3

TYPICAL REPLACEMENT WATTAGE FOR CFS

Incandescent	→	Compact Fluorescent
60 Watts	→	11-15 Watts
75 Watts	→	15-20 Watts
100 Watts	→	18-28 Watts
150 Watts	→	29 Watts

Source: GE Lighting and TechnaBright. Note: Range may vary by manufacturer.



Compact Fluorescents: See Them in a New Light

continued from page 2

the CF will last from 7,500 to 10,000 hours, compared to about 750 hours for an incandescent bulb, according to GE Lighting and TechnaBright.

Historically, CFs have not been well suited for some commercial 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 CFs can be put in any standard incandescent socket, can be used with standard wall dimmers, photo-sensors, electronic timers, and occupancy sensors, and are ideal for use in recessed downlights.

Most of the major manufacturers of CFs have introduced one-piece CFs that combine the ballast and lamp. These one-piece designs are simpler to replace, and multi-tube and radial- or spiral-tube designs help to reduce space requirements. The radial design provides 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 lamps.

The major manufacturers also have recently introduced compact fluorescent lamps in a traditional globe shape very similar in appearance to standard incandescent bulbs. These lamps 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 lamps 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 lamps suitable for use in decorative lighting applications such as chandeliers and candelabras.

In addition, most of the CFs 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 about compact fluorescents, contact your lighting supplier or contractor. ■

Alternative Fuel Vehicles: Service and Savings

continued from page 1

To encourage conversion to AFVs at New York's airports, the Port Authority of NY & NJ and Brooklyn Union Gas opened a natural gas refueling station at John F. Kennedy Airport. This station serves the airport and public around the clock. Currently, the Port Authority is meeting with tenants at JFK Airport to discuss the AFV program and how tenants

Massport, the Massachusetts Port Authority, was recently recognized by the U.S. Department of Energy for its alternative fuel infrastructure and procurement program at Boston's Logan Airport. Currently, 25 percent of Massport's bus fleet operates on CNG. Nine of the 26 new natural gas-fueled buses are in operation. When the remaining buses are delivered, 98 percent of the buses moving people around Logan

Airport will be powered by alternative fuel. Massport's AFV Program Manager, Doug Wheaton, estimates that the addition of the new buses will displace 408,000 gallons of diesel fuel each year and, at current fuel prices, save an estimated \$60,000 annually.

can participate. The Port Authority plans to increase its AFV fleet to 150 natural gas vehicles within the next several years and to open refueling stations at both LaGuardia and Newark Airports. According to Mr. Jose Reyes of the Port Authority of NY & NJ, tenants will be invited to briefings in 1999 to discuss the program and opportunities to take advantage of alternative fuels for airport and airline vehicles.

According to Doug Wheaton, AFV Project Manager at Massport in Boston, businesses often make two critical mistakes when developing an AFV program. The first involves committing to the purchase and use of only one type of alternative fuel. The second is purchasing vehicles prior to defining and addressing the infrastructure requirements necessary to support the vehicle operation, maintenance and fuel delivery.

Baggage transport vehicles often are powered by alternative fuels.



"The success of the Massport project is attributed to its establishment of procurement policies, firm objectives, organizational leadership, and use of multiple alternative fuels rather than committing to a single fuel."

— Doug Wheaton, Massport AFV Program Project Manager

To encourage airport tenants to convert to AFVs, Massport offers a 25 percent discount on its commercial vehicle ground access fee for each vehicle trip conducted by an AFV.

Hudson General operates six natural gas tugs and three electric tow tractors for baggage carts. American Airlines has 20 electric tugs at Logan. US Shuttle, which annually carries more than a quarter of a million passengers to and from Logan, recently acquired CNG vans to serve 10 percent of their customers and intends to replace its entire fleet of gasoline-fueled vehicles with CNG vehicles over the next five years.

Airline operators and airport managers

in New York City also can look to the west coast for AFV programs. In 1996, Los Angeles Airport (LAX), which serves 58 million passengers each year, converted its fleet of airport vehicles to enable them to burn LNG or CNG. Also, for a total cost of \$8 million, LAX added to its large fleet of LNG, CNG and electric vehicles, six transit buses and twelve airfield buses.

LAX also has installed ten free public-use electric vehicle-charging stations in the Central Terminal Area, to support the public's increasing interest in AFVs. In recognition of the air emission reductions achieved, the Southern California Coalition for Clean Air presented LAX with a Clean Air Award.



FOR MORE INFORMATION:

- New York State Energy Research and Development Authority (NYSERDA) offers a tax incentive program for vehicles and refueling property placed in service between January 1, 1998 and February 28, 2003.
www.nyserda.org/afv.html
- New York State Technology Enterprise Corporation's (NYSTEC) Alternative Fuel Technology Center.
www.nystec.com/aftc/about/html
- Port Authority of NY & NJ Contact: Orville A. Romney at (718) 244-3656.
- Massport Contact: Douglas Wheaton, Project Manager, Transportation at (617) 561-1621 or e-mail: dwheaton@massport.com
- Los Angeles Airport Contact: Los Angeles World Airports Public Affairs Bureau at (310) 646-5260.

Cut Costs of Exit Signs continued from page 1

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

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 adaptor. 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 AstralLite, Inc.

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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.

The Bronx Zoo is currently in the midst of a building-by-building effort to replace its exit signs with LED signs. "We've already seen a decrease in labor maintenance using LED signs over the old sign."

— Richard Luniewski, Wildlife Conservation Society.

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.

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.

For more details on use of LED exit signs in New York City airports and advice on how to convert your existing system to LED, contact Hector Orsini of the Port Authority at (212) 435-3353. ■

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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. However, 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.

The U.S. EPA Green Lights program, with more than 2,300 member businesses and organizations, has assisted businesses in performing lighting surveys of their facilities and encourages businesses to upgrade their lighting where it is profitable. The Port Authority of NY & NJ is a Green Lights partner. Through the program, the Port Authority estimates that it will save more than 11 million kWh and \$748,000 per year as a result of lighting upgrades at the World Trade Center and the Port Authority Bus Terminal.

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, 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