Fact Sheet: Responsible Lighting Use

Introduction
Although lighting represents one of the most significant single sources of energy use (typically 20%), many businesses overlook it as an area for potential cost savings. In addition, the lack of proper lighting in a business can also impact employee productivity, safety and security, and the overall aesthetics of a business.

By incorporating more energy-efficient technologies and adapting some simple conservation techniques, small businesses can reduce their impact on the environment while also saving money. Additional benefits to adapting these “green” business practices include, improving public image and leveraging new marketing opportunities.

The following information on responsible lighting use includes advice on retrofitting and replacements; an overview of different lighting types and options; maintenance of lighting systems; proper disposal of lighting-related waste; and tips for utilizing day light.

This fact sheet was prepared by the Business Resource Center (BRC) – the community outreach component of Eastern Washington University’s College of Business and Public Administration. The BRC provides technical assistance, education, and research to individual businesses and community groups in the Spokane area. It is funded by Eastern Washington University, the Herbert B. Jones Foundation, and contracts with participating partners. The mission of the BRC is to generate, exchange, and apply knowledge to improve the economic vitality and sustainability of businesses and communities in the region.

What are Green Business Practices?
Green business practices center around improvements in energy conservation; waste reduction and recycling; water conservation; pollution prevention; and transportation related impacts. Increasingly, numbers of Fortune 500 firms are scrutinizing their businesses in reference to these green business practices. Some are motivated by societal responsibility, but all recognize the direct economic benefits.

Small businesses can achieve the same benefits as larger Fortune 500 firms, but often lack the necessary resources to do so. Time, expertise, or knowledge of where to turn for technical assistance is often a challenge. Even though small businesses may be constrained in the current economic climate, this “disruption” creates a more receptive attitude toward new ideas, particularly those with measurable dividends. Small businesses that engage in green business practices often experience 10% to 20% reductions in operating costs. Realizing these benefits, however, requires increased awareness and technical knowledge of green business practices.

Green business practices lead firms to a better work environment; a healthier workforce; more customers; and an increase in the bottom line.

- City of Spokane SMART Recognition Program

Retrofits and Replacements
There are numerous lighting options, including bulbs and systems, suitable for a variety of applications in businesses. The questions below are aimed at helping businesses determine whether or not a partial or full lighting upgrade/retrofit would be beneficial.

- What is the type of space, and what jobs are being performed in the space (i.e. high-use or low-use areas; commercial, retail, industrial or warehouse space; indoor vs. exterior lighting)?
- Is the color of the light an issue?
- Are there maintenance issues? Are fixtures difficult to reach and bulbs difficult to replace?
- What's the temperature of the space?
- Are automatic lighting controls appropriate?
- Are there disposal considerations for the bulbs and ballasts?
- What are the possible energy savings and paybacks?

Avista Utilities offers Lighting Audits as a part of its free Energy Audit services to small businesses. Contact Program Manager Catherine Bryan for more information (509) 495-8011.

Lighting Types

Incandescent lights are some of the most inexpensive to purchase but have relatively short life spans and often cost the most to operate. They are inefficient compared with other lighting types, with greater than 90% of their energy wasted as heat.

Halogen, tungsten halogen or quartz halogen, are a type of incandescent light commonly used for display
lighting, floor lamps, and track lighting, as well as outdoor security and flood lighting. They typically are more energy efficient than standard incandescent lights, but still have relatively short life spans. Halogens also operate at high temperatures.

**Fluorescent** tube lighting is the standard indoor lighting source for both general and task lighting in many commercial and industrial settings. In regards to type, the two most commonly used fluorescent tube lighting is T-8 (1" in diameter) or T-12 (1.5" in diameter). T-12 tubes are the more conventional form of fluorescent lighting for businesses. They are 3 to 4 times more energy efficient than incandescent lighting and last 10 to 20 times longer. T-8 tubes, however, are growing in popularity because they save 15% to 20% more energy than T-12 tubes and generate a higher quality of light.

Retrofitting from T-12 tubes to T-8 tubes typically requires the replacement of the lighting fixture ballast. Ballasts regulate the voltage and current of electricity that passes through the fluorescent lamp. Older ballasts are typically magnetic in nature, while more modern ballasts are electronic. Electronic ballasts, which many new T-8 lamps require, are more energy efficient than the older magnetic versions. In addition, electronic ballasts do not hum or flicker like magnetic ballasts do and have a life span of up to 25 years.

<table>
<thead>
<tr>
<th>T-8 fluorescent lamps operating on an electronic ballast system use 35% to 40% less energy than a T-12 fluorescent lamp operating on a magnetic ballast system.</th>
</tr>
</thead>
</table>

**Compact Fluorescent (CFL)** bulbs are much smaller than fluorescent lamps and are available in many different shapes and sizes for a number of different applications. They typically use electronic ballasts, which eliminate flickering and allow for dimming.

<table>
<thead>
<tr>
<th>CFL bulbs are typically 75% more energy efficient than standard incandescent lights and last 10 times longer.</th>
</tr>
</thead>
</table>

**High-Intensity Discharge (HID)** lights are an energy efficient option for indoor industrial settings, security and exterior lighting. There are several types of HID, but Metal Halide and High and Low Pressure Sodium are the most efficient and commonly used. Metal Halide lights typically last 10 to 15 times longer than standard incandescent lights. They have quick start ups and an array of color options for use in a variety of applications. High and Low Pressure Sodium lights have slow start ups and limited color options, making them best suited for exterior lighting. They typically last 20 times longer than standard incandescent lights.

<table>
<thead>
<tr>
<th>High and Low Pressure Sodium lights typically last 10 to 15 times longer than standard incandescent lights. They have quick start ups and an array of color options for use in a variety of applications. High and Low Pressure Sodium lights have slow start ups and limited color options, making them best suited for exterior lighting. They typically last 20 times longer than standard incandescent lights.</th>
</tr>
</thead>
</table>

**Exit Signs** Standard incandescent exit signs have a high operating cost and a short life. Newer LED (Light-Emitting Diodes) exit signs use less than 2 watts and are essentially maintenance free since they last for decades. Most exit signs can be easily upgraded with LED conversion kits.

<table>
<thead>
<tr>
<th>LEDs are typically 75% to 95% more energy efficient than standard incandescent lights and last up to 300 times longer.</th>
</tr>
</thead>
</table>

**Automatic Lighting Controls** Automatic lighting controls help to ensure that energy used for lighting is not unnecessarily consumed. Many automatic controls are simple to install and relatively low in cost. There are numerous types for different room sizes, applications, and needs.

**Occupancy/Motion Sensors** detect the presence or absence of people in an area and prevent the overuse of energy to light spaces. Several types exist and range in price from less than $100 to several $1000s. They are often good options for sporadically used areas, such as restrooms.

**Photocells** sense the ambient light conditions and switch off lights in spaces that have adequate natural lighting. They are compatible with most types of lamps (but not all ballasts) and are used for both indoor and outdoor applications.

**Timers** switch lighting on and off according to preset schedules. Many are easy and inexpensive to purchase and install. Timers are appropriate for incandescent and most fluorescent lights.

<table>
<thead>
<tr>
<th>It is estimated that installing automatic lighting controls can typically save 10% to 45% of lighting costs in a business.</th>
</tr>
</thead>
</table>

**Maintenance of Lighting Systems** Cleaning and inspecting lamps and fixtures regularly can greatly improve their efficiency. In addition, dents, scratches, and burns in fixtures can result in rusting, which reduces reflectance and life span.

Be sure to use manufacturer-recommended compounds for cleaning. Improper or over-used cleaning compounds can deteriorate fixture surfaces. Below are some general guidelines for various lamps and fixtures.

**Aluminum Fixtures** Apply mild soaps and cleansers followed by a thorough rinse with clean water. Never use strong alkaline cleaners.

**Glass** For lenses, use detergents or nonabrasive cleaners and rinse after. Glass reflectors may be wiped dry.

**Plastics** Use anti-static compounds rather than ordinary detergents. Do not wipe plastics dry after application of a rinse solution. Vacuuming is the most effective method for drying plastics.

<table>
<thead>
<tr>
<th>Dirt and dust accumulation may reduce light output by as much as 30%.</th>
</tr>
</thead>
</table>
Lighting Waste Disposal
Both lighting upgrades and routine maintenance entail the removal of lamps and ballasts, which result in waste. The U.S. Environmental Protection Agency estimates that approximately 600 million fluorescent lamps are discarded each year in the U.S. When fluorescent or HID lamps are broken they release mercury that may be damaging to the environment and human health. In 1995, the mercury from discarded fluorescent and HID lamps accounted for over 13% of the mercury found in municipal landfills in the U.S.

Another potentially dangerous pollutant, Polychlorinated biphenyls (PCBs), is often found in ballasts manufactured and distributed in the U.S. and Canada prior to 1979. Since these ballasts often have a service life of 25 years or longer, many are still in existence in buildings throughout the U.S. and Canada. Ballasts free of PCBs usually contain the label “NO PCBs.”

Below are some tips for the proper disposal of old lights and fixtures:

- Do not break or crush lamps. Store unbroken used lamps in a protected area in a box or drum. Label appropriately.
- If a lamp is accidentally broken, store all of the debris in a sealed, airtight container and label “Broken Fluorescent Lamps – Contains Mercury.” Mop the area. Do not vacuum to avoid vaporizing the mercury.
- Contact local hazardous waste haulers for information on collection, disposal, and fees associated with pickup of old lights and fixtures.

T-12 tubes contain significantly more mercury than T-8 tubes.

Using Day-light to Save $$$
Modern buildings designed to better utilize day light typically use 40% to 60% less energy for lighting than conventional buildings. Utilizing day light can also help reduce energy use associated with heating and cooling.

Below are some tips for better utilizing day light:

- Install skylights where possible.
- Situate desks/work areas near windows and skylights.
- Open window treatments during the day.
- Keep windows clean.
- Remove objects obstructing windows.
- Reduce window glare by installing louvers, reflective blinds, or reflective window coverings.
- Turn off or reduce the use of unnecessary artificial lights.

National Energy Conservation Partners and Resources

Local Energy Conservation Partners and Resources
- Avista Utilities – www.avistautilities.com
- SMART Business Recognition Program - www.developingspokane.org/incentives/green_incentive
- Spokane Neighborhood Economic Development Alliance SNEDA – www.sneda.org
- Spokane Neighborhood Action Programs (SNAP) – www.snapwa.org
- Spokane Transit Authority – www.spokanetransit.com
- Sustainable Local Investment Partnership (SLIP) – Jim Wavada (509) 358-7894
- Waste Reduction Assistance Program (WRAP) – www.solidwaste.org

For more information, contact:
The Business Resource Center (BRC)
Eastern Washington University
668 N. Riverpoint Blvd.
Spokane, WA 99202-1660
Phone: (509) 358-2255
Fax: (509) 358-2267
Email: Web site:

Last updated April 15, 2009