

Many Americans love to decorate during the holidays with strings of lights, and most people currently use standard incandescent C7 lights or mini-lights. Two energy-efficient alternatives to consider are LED lights and fiber optic trees.

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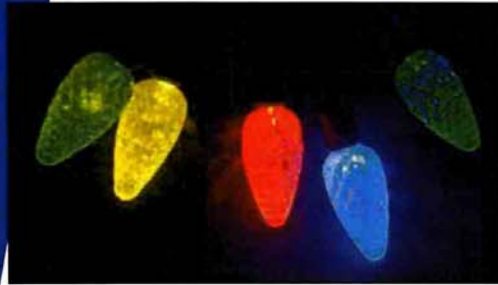
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Energy Efficiency FACTSHEET

Holiday Lights: LED and Fiber Optics

Decorating with "holiday lights" is becoming more of a year-round activity. As more lighting is used and as energy rates climb, consumers find that decorating with lights is costing more. Most people currently use standard incandescent C7 lights or mini-lights.



There **are** better ways! LED lights and fiber optic trees are two energy-efficient technologies that can reduce your energy costs, particularly when the lights are used for long periods of time, such as in commercial applications.

LED Lights

Light Emitting Diode (LED) holiday lights are a new application for a mature technology. Each year

manufacturers have improved the choices, producing bigger and brighter bulbs and new color options. LED lights have a number of benefits over conventional lighting:

- Energy-efficient – 0.08 watts per LED C7 multicolor bulb (compared with 0.48 watts for an incandescent mini-light and 6.0 watts for a standard incandescent C7 bulb).
- Long life span – up to 100,000 hours or more used indoors, half that outdoors, and some manufacturers provide a limited lifetime warranty.
- Safety – no chance of combustion since the bulbs are cool to the touch, regardless of how long they are left on.
- Sturdy bulbs – the epoxy lenses are virtually indestructible.

LED lights are currently available in strings from 25 to 150 bulbs with red, green, blue, white, yellow and multi-colored bulbs. There are many styles available including mini-ice, ball-shaped, and C7 and C9 (candle-shaped) bulbs (*see photo on page 2*). Amber or orange Halloween lights and patriotic red, white and blue sets are also available. Costs can vary substantially by color because, rather than painted bulbs, the color is produced by the chemical make-up of the bulb. White and blue are the most costly.

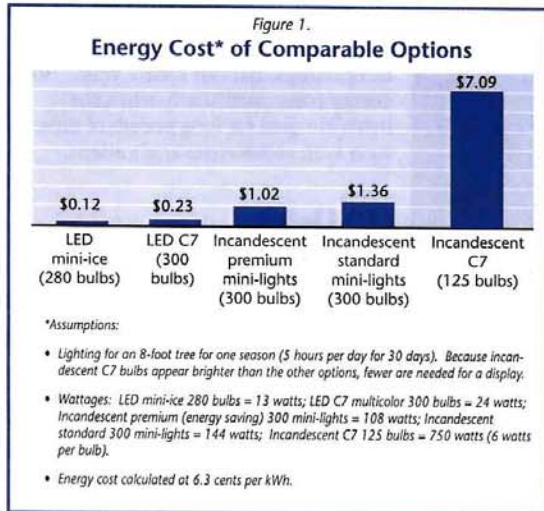
New products in 2005 include icicle-style lamps, strings that change from one color to another, strings with commercial-quality plugs that allow more than 100 strings to be connected, rope lights, and additional holiday ornaments. At least one company is offering screw-in LED bulbs for converting your incandescent strings to LED.



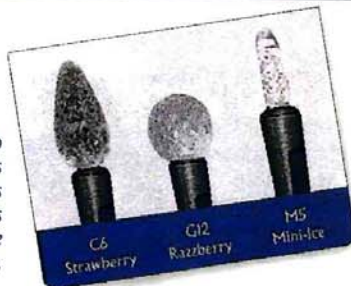
Photo courtesy of Kellogg Plastics

LED lights have a different appearance from the familiar incandescent models. They may appear to shimmer with movement as the light passes through the faceted bulbs. Side-by-side with an incandescent bulb they do not emit equal light, although some LED bulbs on the market this year are closer to the brightness of incandescent. In spite of the differences, LED lights can be used for beautiful and affordable holiday decorating.

As illustrated in *Figure 1*, keep in mind that over time the cost to operate energy-consuming devices overcomes the initial purchase price. Despite a higher initial cost, LEDs are a clear winner over incandescent C7 lights when you compare the cost to purchase *and operate* a system for five years (and beyond).



Using timers to reliably turn off lights during daylight hours and other times can further reduce energy costs.



The EnergyIdeas Clearinghouse provides information on a broad range of energy technologies for commercial and industrial customers of Pacific Northwest utilities. The EnergyIdeas Clearinghouse provides a searchable website and has a team of energy specialists ready to respond to technical information requests by phone or email. Sponsored by the Northwest Energy Efficiency Alliance.

Web: www.EnergyIdeas.org
 Regional Hotline: 1-800-872-3568
 Email: info@energyideas.org

Fiber Optic Artificial Trees

Another relatively energy efficient tree lighting strategy is the fiber optic artificial tree. These trees use a single incandescent bulb ranging from 5 to 50 watts, depending on the size of the tree.

Light is transmitted from the single bulb (so there's only one bulb to replace) through hundreds of very small fibers and emitted along each branch of the tree. Some trees come equipped with a rotating color wheel that changes the color emitted from the fibers.

Fiber optic lights are cool to the touch, as only light is transmitted from the fiber and not heat. The incandescent light source is located in the base of the tree with ventilating holes that must not be covered.

The cost for such trees ranges from \$20 for a 2-3-foot tree to over \$200 for the largest trees. Fiber optics are also now used in many other decorations such as Santa or Angel figures and wreaths.



A Note About Wiring

The wiring is a weak link in any system. Improperly attaching light sets with staples, winding wires around nails, and other practices can damage wiring, as can prolonged exposure to sunlight. Treating the wiring with care will extend the life of any light set and increase safety as well.

Before putting up your lights, test the system and inspect the wires for defects. Many shoppers now note a warning on light set packaging regarding lead in the wire coatings. The coatings are the same on all wiring, and washing hands after handling is recommended, but the wires of today are no different in this respect than the unlabeled ones of the past.

More Holiday Lighting Information

For current news, purchasing sources, and safety considerations: www.energyideas.org/holiday

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WSUEEP02_122 December 2002, Updated October 2005