



PW-15

**LEDs in traffic signals**

The city of Portland, Oregon (529,000), has replaced almost all of the red and green incandescent light bulbs in its traffic signals with light-emitting diodes (LEDs). LEDs last three to five times longer than incandescent bulbs and use 80–90 percent less electricity, although they are more expensive to purchase. Moreover, while incandescent bulbs burn out immediately, LEDs just become fainter over time; this gives maintenance workers time to replace LEDs before public safety is jeopardized. The city is leasing the LEDs for five years and has the option of keeping them after that period. The initial cost of the LEDs was \$2 million (the price of LEDs has dropped since Portland purchased them), but the city received \$700,000 in incentive payments from the electric utility. With the saving of \$350,000 a year in electricity costs and an additional \$50,000 worth of reduced maintenance, the LEDs are expected to pay for themselves within three years.

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**ENERGY EFFICIENCY SUCCESS STORY**  
**LED Traffic Signals = Energy Savings**  
for the City of Portland, Oregon

In 2001, the City of Portland replaced nearly all its red and green incandescent traffic signal lights with new signal lights featuring highly efficient light-emitting diodes (LEDs).

The right timing and carefully arranged financing resulted in a successful energy-efficiency project, with annual energy and maintenance savings totalling \$400,000 and net payback in less than three years.

**A Project Whose Time Had Come**

In 1995, when the City of Portland first looked at the LED option, green LEDs were not available and red LEDs were quite expensive. In 2001, they found that prices had dropped dramatically.

*“When we investigated last year, I thought the sales rep was pulling my leg. The new LED prices were less than half of what they had been...The cost of technology had come down while power prices were going up and utilities were offering aggressive rebates for energy efficiency.*

*It was—and still is—an ideal time to act.”*

—Curt Nichols, Senior Energy Manager for the City of Portland.

Portland seized the opportunity and met the project's budgeting and timing challenges. By the end of the year, 6,900 red and 6,400 green incandescent signal lamps had been replaced with LED lamps, and the savings had begun.

**The City**  
Portland, Oregon

**The Project**  
Retrofit traffic signals with LED lamps

**The Utilities**  
PGE and Pacific Power

**The Cost**  
\$2.2 Million (Total)  
\$800,000 (net)

**The Challenge**  
Fund the project with no capital budget

**The Achievement**  
In three months more than 13,300 signals retrofitted to LED

**The Benefits**  
Annual Energy Savings of \$335,000  
Annual Maintenance Savings of \$45,000  
Net Return on Investment: 37% (energy only) 44% (Total)