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Green Sheet

City of Ann Arbor Environmental News

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LEDS - ANN ARBOR "LIGHTS" THE WAY TO ENERGY SAVINGS

Ann Arbor world pioneer in the use of LED streetlights

The City of Ann Arbor is lighting the way to reduce energy costs and increase street light efficiency with a new Light Emitting Diode (LED) technology program, the first full-scale LED conversion project of its kind in the world. Thanks to custom designed LED technology, the city may potentially cut its streetlight energy bill in half and significantly reduce light pollution.

In 2008, the City of Ann Arbor paid \$1.5 million, nearly 25 percent of its energy budget, on traffic signals and streetlights. This cost would have been higher had the city not begun replacing incandescent traffic signals and pedestrian crossing signals with LED fixtures back in 2000. LED streetlights have saved the city \$49,000 annually and have the potential to save the city even more money if LED technology can be utilized for street lighting, which accounts for 92 percent of that \$1.5 million annual cost. This is the result the city is hoping for with its LED pilot program for lighting public spaces and roads.

What are LEDs?

LEDs have been around since the 1960s. They are semiconductors, like computer chips, that emit light when electricity runs through them. Because the chip itself glows, there is no glass tube to break and no filament to burn out.

Although LEDs have been used as indicator lights in consumer products for years, they have just recently become practical for general lighting purposes. Their initial cost is higher, but LED lights use half the energy (or less) and last longer than conventional bulbs, resulting in big savings and short payback periods. One specific advantage of LEDs is that they produce directional light. This provides more control over lighting, and helps reduce light pollution and wasted energy.



Cobrahead fixtures

Globe LED lights

LED Streetlights

In March 2006, LED globe lights (right photo) were installed on a full block in downtown Ann Arbor. The prototype design, created by Relume Technologies of Oxford, Michigan, is the first of its kind in municipal street lighting.

After this successful pilot project, the city expanded the LED program to include the conversion of more than 1,000 downtown streetlights. The Ann Arbor Downtown Development Authority contributed \$630,000 to the LED retrofit project. Ann Arbor is also testing several different varieties of what are called "cobrahead" fixtures (photos left and center) on residential streets such as Glendale Drive. After seeing the success of the city's test of LEDs, the University of Michigan is testing LED globe fixtures on North Campus near the Art and Architecture building. These fixtures include one that is solar-powered.

"There are many benefits to LED lighting, including decreased maintenance and energy savings that reduce fossil fuel use, meaning less air pollution and less global warming impact," said Assistant Manager of Field Operations Mike Bergren. "We are proud of the fact that lighting experts from across the United States have traveled to Ann Arbor to see examples of LED lights in use."

Bright Idea Recognition

The LED pilot program has received considerable recognition including:

- Winning the International Council for Local Environmental Initiatives's first annual Climate Innovation Invitational Award;
- Being featured in a video about Ann Arbor innovations that aired at the 2007 International City Managers Assn. conference; and
- Project presentations by city staff at numerous local, national, and international conferences in cities such as Atlanta, Ga.; Chicago, Ill.; Fayetteville, Ark.; and Montreal and Toronto, Canada.



Ann Arbor to host LED City® Council Meeting

On October 20-21, 2008, officials from cities, universities, and utilities across North America will meet in Ann Arbor to learn how LED lighting applications can reduce energy and maintenance costs for municipalities. Experts from Ann Arbor; Toronto; Raleigh, N.C.; Austin, Tex.; and Welland, Ontario will present information on their LED projects for street, parking area, architectural, and interior lighting.

The LED City is a community of government and industry groups working to promote LED lighting technology for municipal applications to save energy, protect the environment, reduce maintenance costs, and provide improved visibility and safety. For more information on LED City, visit www.ledcity.org/councilmeeting.

Indoor LED Applications

A conference room in Ann Arbor City Hall is exhibiting the latest advances in LED indoor lighting technology. The conference room is the first municipal installation in the country to replace the standard fluorescent lamps, found in most offices and meeting rooms, with direct replacement LED lights. These LED "tubes" simply drop in to replace the fluorescent tubes in the fixtures and do not require new installation technology. While still in the early manufacturing stages, ilumisys, a Michigan-based, solid-state lighting developer, has donated this breakthrough technology to the City of Ann Arbor.

"The City of Ann Arbor has demonstrated clear leadership in implementing next generation lighting technology," said ilumisys President Dave Simon. "When we began looking for municipalities to partner with, it became quickly apparent that our neighbors in Ann Arbor are international leaders in adopting LED lighting. Along with the governor's alternative energy initiatives, this project helps build momentum for all of Michigan to become a world leader in solid-state lighting."

Advantages of LEDs

- **Save Energy**
 - Indoor LED tubes use 28 watts instead of the fluorescent bulb's 32 watts.
 - LED globe lights require 56 watts of power to produce the same amount of emitted light as the city's standard 120-watt metal halide bulbs.
 - Cobrahead LED fixtures require 50-80 watts instead of 250-watts for conventional fixtures.
- **Last Longer**
 - The expected life of indoor LED tubes is 60,000 – 100,000 hours, up to 10 times longer than a fluorescent tube.
 - LED globe lights have a life expectancy of 10 years, compared with the current globe light's 2-year life span.
- **Less Light Pollution** – LED light is directional and can be projected downward to the street, reducing skyward light pollution.
- **No Mercury** – LEDs contain no mercury. Annually, 500 million fluorescent tubes are discarded in the United States. One 4-foot fluorescent tube has enough mercury to contaminate 6,000 gallons of water beyond safe levels for drinking.
- **More control options** – Instant on and dimming abilities of LEDs offer additional energy savings. Motion sensors can turn LEDs on and off instantly, allowing lighting to be used only when needed. Since typical outdoor lights take several minutes to come to full brightness, they can't be used with motion sensors.



Green Sheet is an environmental newsletter for Ann Arbor citizens, coordinated by the City Communications Office. Please send your suggestions and article ideas to Nancy Stone, nstone@a2gov.org, 734.994.4176. For information on City of Ann Arbor green initiatives visit www.a2gov.org/green.

For information on the city's LED program visit www.a2gov.org/energy and click on "LED Lighting." E-mail specific questions to streetlights@a2gov.org.