ENERGY FACTS

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Better Bulbs, Better Jobs: Case Studies in Ohio's Energy-Efficient Lighting Industry

Ohio has long been a leader in manufacturing. Located within 600 miles of 62 percent of North America's manufacturing locations,[1] its strong workforce and proximity to markets have helped to make it a global leader in producing high-quality goods. While the economic downturn shuttered some of its factories, Ohio is seeing an economic resurgence in a newer industry: energy-efficient lighting. Responding to new federal lighting efficiency standards and the state's energy efficiency resource standard, dozens of companies in Ohio, large and small, are inventing, manufacturing, and deploying better-performing, energy-efficient lighting solutions. These companies are creating much needed jobs, reducing energy bills for businesses and households, and cutting pollution that harms Ohioans' health and safety.

EFFICIENCY BENEFITS OHIO'S WORKFORCE AND CONSUMERS

Ohio's burgeoning lighting industry is closely linked to the state's rich history in manufacturing innovation. As the birthplace of inventions such as steel, the microwave oven, and rubber car tires, as well as innovative companies like the Dow Chemical Company and Proctor and Gamble, Ohio has long been a leader in developing new technologies.

Perhaps nowhere is this truer than in the Cleveland area. From lighting giant General Electric (GE)'s regional influence to the city's proximity to Thomas Edison's birthplace, Cleveland is the cradle of the efficient lighting industry. In 2010, Cleveland had nearly 1,000 workers making more efficient incandescent (halogen) light bulbs, compact fluorescent light bulbs (CFLs), and light emitting diodes (LEDs).[2] More new jobs are on the way according to bulb manufacturers GE and TCP, which have announced plans to expand manufacturing capacity in the state.

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The growth of Ohio's efficient lighting industry is part of a larger state and national trend: the country's clean, renewable and energy-efficient economy grew at an annual rate of 3.4 percent between 2003 and 2010. This sector outperformed the rest of the economy during the recession, according to the Brookings Institution. Ohio currently has more than 105,000 jobs in its clean economy, including more than 1,500 jobs manufacturing energy-efficient lighting.[3] Those numbers do not include recent job growth at companies like GE and TCP. Nor do they include the hundreds of workers employed in implementing lighting retrofits across the state.

In addition to jobs, Ohio's energy-efficient lighting industry is providing monthly savings to consumers on their utility bills. Federal energy efficiency standards for light bulbs are projected to save Ohio consumers $366 million each year, or $79 per year per household.[4] Adopting energy-efficient lighting that exceeds federal standards, such as CFLs and LEDs, made by local companies large and small, will offer even more savings.

Those savings will, in turn, provide business and consumers more control over their energy expenses and have a spillover effect into the broader economy: businesses and consumers can use the money saved on their utility bills to pay for other goods, services and expenses for their families. Because it takes more labor to make a hamburger than a kilowatt, energy savings improve the state's economy at large, employing more workers and keeping restaurants and shops open for business.

BILLS FOR BETTER BULBS

Federal and state energy efficiency standards have played an integral role in the growth of the energy-efficient lighting industry in Ohio. A recent American Council for an Energy Efficient Economy (ACEEE) study found that federal lighting and appliance efficiency standards were, in 2010, responsible for the creation of 340,000 U.S. jobs, including 12,600 in Ohio.[5]

FEDERAL POLICY

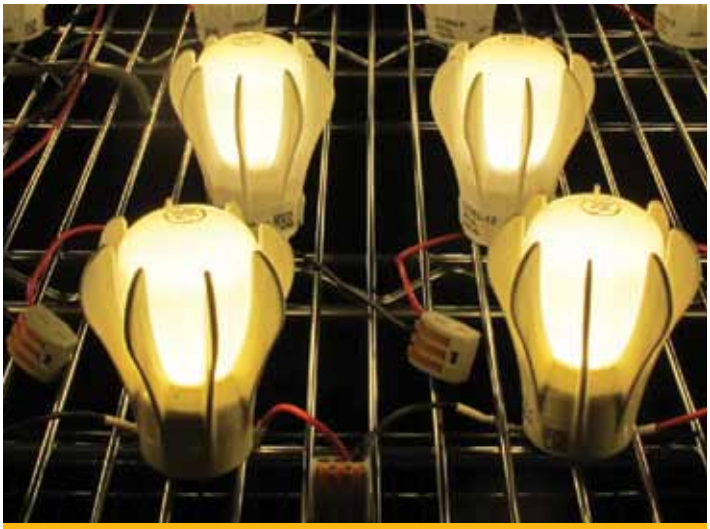
In 2007, the U.S. Congress enacted and President Bush signed into law energy efficiency standards for light bulbs. Beginning in 2012, these standards will require that all new light bulbs use 25 to 30 percent less energy. The standards are performance-based and technology neutral. They do not ban the incandescent light bulb. Several manufacturers, including GE, Philips, and Osram Sylvania, are already making new and improved energy-efficient incandescent bulbs that look and work just like the 125-year old Edison bulb, but use less energy. Consumers also have the option to buy CFLs and LEDs, which provide even greater energy and cost savings.[6]

As there are more than 4 billion screw-based sockets in the United States, the transition to more efficient light bulbs will provide significant benefits, including:

- Electric bill savings of more than $12.5 billion per year;[7]
- Energy savings equivalent to 30 large power plants;[8] and
- Reduced pollution, including a 60 percent reduction in mercury emissions from power plants and prevention of approximately 100 million tons of carbon dioxide pollution per year.[9,10]

These energy efficiency standards have broad support. The National Electrical Manufacturing Association (NEMA), the trade association representing nearly every lighting company, supports the standards, as do the nation's leading consumer groups, such as Consumers Union and Consumer Federation of America.

People throughout America value the better bulbs that these standards bring. A *USA Today* poll found that 71 percent of those surveyed had already replaced bulbs in their homes with more efficient alternatives. The new bulbs had an 84 percent satisfaction rating. The standards themselves were supported by 61 percent of those surveyed.[11] Ohio voters also voiced strong support for energy-efficient lighting. In a recent poll released by Consumers Union and NRDC, 85 percent of Ohio voters reported that they have installed and are using energy-efficient technologies and 60 percent of voters in Ohio support the federal standards.[12]



GE's new LED light bulbs, pictured here in Cleveland area testing labs, are one of many evolving lighting technologies driving Ohio's energy efficiency economy.

OHIO STATE POLICY ENCOURAGES ENERGY SAVINGS

Ohio has policies of its own to facilitate the deployment of more efficient technologies. The state's energy efficiency resource standard (EERS), passed in 2008 as part of Senate Bill 221, requires Ohio's utilities to achieve a cumulative energy savings of 22 percent by 2025. In addition to minimizing pollution from power plants and saving consumers money, the bill also supports Ohio's energy efficiency companies, some of whom have seen their business double as the state standards take effect.

Ohio's EERS enjoys widespread public support: 60 percent of Ohio voters, in addition to federal standards, support state government standards like those in Ohio's S.B. 221, which require electric utilities like Duke Power, AEP, and Dayton Power & Light to help their customers become more energy efficient.[13]

SPOTLIGHT ON OHIO BUSINESSES: LEADING THE ENERGY EFFICIENT LIGHTING INDUSTRY

Ohio is home to lighting manufacturers large and small, from old-timer GE Lighting to relative newcomer TCP. Beyond manufacturers of energy-efficient lighting solutions, Ohio's economy includes many small businesses and individuals working as performance contractors, retrofitters, and electrical service providers to deploy and install efficient technologies in homes, businesses, and factories across the state. These companies have performed well despite Ohio's economic downturn as demand for lower energy bills surges. Following are examples of companies of all sizes that contribute to Ohio's leadership in the energy-efficient lighting industry.

LIGHTING MANUFACTURERS

GE LIGHTING

Location: East Cleveland, Ohio

Date opened: 1912

Manufacturing: CFLs, LEDs, and efficient metal halide bulbs

Number employed: 700 at East Cleveland corporate headquarters

Efficiency claim to fame: First Energy Star-certified incandescent replacement LED bulb.

About to celebrate 100 years at their corporate campus, GE is arguably the foundation on which Cleveland's burgeoning lighting industry has grown. With 700 people working at the campus, and aggressive local recruitment programs for engineers and designers, the company plays just as integral a role in the local economy today as it did a century ago.

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Gary Allen, Senior Physicist on GE Lighting's Lighting Innovation Team, led the team effort to develop omnidirectional LED lamps.

GE has especially significant influence in the LED lighting industry, with a large research and development focus on the East Cleveland campus. LEDs are an excellent directional light source, acting like a highly focused flashlight. While this trait is a strength for showcasing items in department stores or lighting small spaces like elevators, most homeowners would rather have a better-distributed glow for room lighting and reading lamps. Thanks to a GE Senior Physicist Gary Allen, LEDs are beginning to get that glow.

Taken by a ping pong ball's uniform shape, Allen brought one into work one day cut a small hole in it, and slipped it over a tiny LED light source. The result was an evenly distributed glow, and the inspiration for GE's new "omnidirectional" LED bulb. As the first Energy Star LED incandescent replacement, the 40-watt replacement bulb uses only 9 watts, a small fraction of the energy used by its inefficient incandescent counterparts. The LED bulb lasts a lot longer, too.

TCP

Location: Aurora, Ohio

Date opened: 1993

Manufacturing: CFLs, LEDs, and energy-efficient halogen bulbs

Number employed: 200 in Ohio, of whom about 25 manufacture coiled bulbs

Efficiency claim to fame: Among the first to commercialize automated CFL lamp manufacturing technology that has expedited the bulb's manufacturing process.

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A TCP testing room, where CFLs undergo hours of rigorous testing before being released to market.

Contributing to the region's lighting efficiency and job creation is Cleveland neighbor TCP Inc., one of Ohio's biggest energy-saving light bulb companies. TCP was among the first to develop an automated CFL-twisting technology that increases production efficiency. As a result, the company is moving some production back from China to the U.S. and is poised to increase local hiring.

TCP's production methods are not their only efficiency innovations. From fully dimmable CFL bulbs to bulbs with a wide color-temperature spectrum and CFLs that quickly get to full brightness, TCP's technologies are solving problems that have often been associated with earlier CFLs.

TCP also has a solution for those attached to the classic incandescent bulb's shape. The company manufactures bulbs that have old-fashioned shapes but new technologies, including LED, CFL, and incandescent bulbs that hark back to their classically-shaped cousins. There is tremendous demand for these "retro"-looking bulbs with advanced technology. TCP supplies big box retailers, including Home Depot, Lowes, Walmart, Sears, and many more.

ADVANCED LIGHTING TECHNOLOGIES (ADLT)

Location: Solon, Ohio

Date opened: 1995

Manufacturing: Energy-efficient lamps and materials specializing in metal halide and 2X more efficient incandescent lighting

Number employed: 120 in NE Ohio, 300 nationwide

Efficiency claim to fame: ADLT uses nano-technology in its coated capsule at the core of a bulb twice as efficient as, and nearly identical to, a conventional incandescent.

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Steve Stockdale of Advanced Lighting Technologies with ADLT's 2X incandescent bulb. Visible inside is the capsule responsible for the bulb's 100% efficiency increase.

Advanced Lighting Technologies, another Cleveland neighbor, is a technology innovator and manufacturer of energy-efficient lighting, with US operations in Ohio, California and Illinois. Through its subsidiary Venture Lighting, ADLT has developed a halogen bulb that is twice as efficient as conventional incandescent bulbs. The company is achieving higher efficiencies than many of its competitors, while keeping production costs low so the bulbs can be affordable.

The technological breakthrough for ADLT's super-efficient halogen bulb is in the interior capsule. Coated in 63 layers of nanofilm, the capsule recycles light heat that would otherwise be wasted back into the filament, converting it into light energy. Developed in Ohio, the capsule is expanding efficient lighting options for customers who want the instant-on glow of an incandescent, without all that energy waste.

LSI LED

Location: Cincinnati, Ohio

Date opened: 1976

Number employed: 800 in Ohio, 1200 in North America

Manufacturing: Lighting fixtures for high efficiency LED and fluorescent light sources

Efficiency claim to fame: Produces workhorses of efficient lighting fixtures used in landmarks such as New York City's George Washington Bridge.

LSI Industries' LED lighting, featured here on New York's George Washington Bridge, creates good jobs in Ohio while saving money for municipalities and businesses.

Bob Ready started LSI in partial response to the Arab oil embargo of the mid-1970s, developing a lighting fixture to house a more efficient light under the canopies that shelter gas dispensers from inclement weather. Thirty-five years later, the company has grown dramatically, while maintaining its manufacturing operations in the United States. One of the few lighting companies that has always kept its design and manufacturing operations in the U.S., LSI Industries proudly uses the slogan "American innovation, American made."

The company credits its focus on energy-efficient lighting solutions for its success. Commercial and industrial customers seeking lighting solutions that lower their carbon footprint and maximize energy cost savings caused LSI's lighting sales to grow more than 23 percent in 2010 despite a difficult economy. LSI's manufacturing operations in Ohio alone employ more than 800 people.

In particular, LSI's line of LED lighting fixtures, the kind now housing lights illuminating the bridge, has raised the company's profile. The lights within the fixtures allow customers such as the city of New York to save 40 to 80 percent on their lighting energy costs, while also reducing carbon pollution.

LSI supports manufacturing plants in Cincinnati and Columbus in addition to its corporate headquarters. In Erlanger, Kentucky, just across the Ohio River from Cincinnati, its manufacturing plant employs 100 workers.

GRAFTECH

Location: Parma, Ohio corporate headquarters and R&D, and Lakewood, Ohio manufacturing.

Date opened: 1886

Manufacturing: Flexible graphite sheet to distribute heat inside of LEDs

Number employed: 250 at Parma location, 144 at Lakewood location, 3200 worldwide

Efficiency claim to fame: Technology to help lighting and other industries achieve energy efficiency goals by managing heat.

GrafTech's thermal management materials help dissipate heat inside LED lights.

Located at the site where the world's first street light was developed, this 125-year-old company manipulates the unique thermal insulation and dissipation properties of flexible graphite to manage heat generated inside LED lights.

While lighting is only one of its specialties—GrafTech's innovators also work on materials that enable technologies like smartphones and polysilicon manufacturing, and won a technical achievement Academy Award in 1956 for developing a flame yellow carbon process used in color photography—the company is one more manufacturer in Ohio that is spurring growth in the local clean energy economy. GrafTech has nearly doubled its workforce in Ohio over the past five years.

J&M ELECTRICAL SUPPLY

Location: Cambridge, Ohio

Providing efficient lighting upgrade service since: 1973

Number employed: 7

Efficiency claim to fame: J&M says all of its clients make money off of their lighting investment, some in as little as a year.

J&M Electrical Supply, a family-owned company with 35 years of electrical distribution experience, helps its clientele save money by investing in energy-efficient lighting upgrades, some of which include products from Cleveland's own TCP. J&M's projects upgrading area businesses with more efficient lighting have doubled over the past two years, driven by a combination of improved technologies, utility incentives, and energy efficiency standards.

Utilities' lighting retrofit incentives—nearly all spurred by Ohio S.B. 221's energy efficiency standards— have encouraged many customers to invest in an efficiency upgrade. Even without energy-efficiency incentives, payback time can be as little as one to two years, especially in commercial and industrial facilities that operate around the clock. With rebates from utilities such as American Electric Power, the lighting investments are a "no brainer" for companies, says Bill Jarvis, J&M's sales manager.

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Bill Jarvis of J&M next to an outdoor LED lamp. J&M frequently utilizes similar lamps in their efficient lighting upgrades.

No matter the payback time, projects save money on the electric bill from the moment of installation, strengthening both the company and the regional economy. Local businesses with lower lighting bills can spend money on employees and new investment, rather than on energy to power inefficient incandescents.

J'S SERVICE LIGHTING

Location: Cambridge, Ohio

Providing efficient lighting upgrade service since: 1988

Number employed: 3

Efficiency claim to fame: Helped a local factory cut its lighting bill in half through T-8 flourescents and other efficient lighting solutions.

Even the smallest businesses contribute to Ohio's increasing energy efficiency. Another Cambridge, Ohio entrepreneur working to cut electricity costs is Jay Patterson of J's Service Lighting, providing energy savings for his customers since the 1980s. Jay says he limits himself to customers within a 45-mile radius of Cambridge, Ohio's 11,000 person municipality, because his daily schedule is overbooked as it is. His ability to cut customers' energy bills—and, more recently, S.B. 221—have both driven a strong demand for his services.

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Jay Patterson of J's Service Lighting. The T-8 fluorescent lights in the background were installed as part of a larger project he completed to shave off more than half of a local factory's lighting bill.

Patterson has completed lighting retrofits in many local factories, including a plastic plant on the outskirts of Cambridge. By switching over the factory to T-8 fluorescent lighting and making other modifications, he helped cut the factory's facility's lighting bill in half. Given that lighting comprises close to 35 percent of a factory's overall energy bill, these savings have significant monetary impact.

HOW TO TAKE ADVANTAGE OF NEW ENERGY-EFFICIENT LIGHTING

Ohio's burgeoning energy-efficient lighting industry is good not only for the people it employs, but also for the consumers it serves. By taking advantage of efficient lighting products, consumers can help keep jobs in the state while also keeping more money in their own pockets through lower energy bills. Here are some tips on how to best take advantage of these new lighting technologies and support Ohio's lighting industry.

How to find Ohio manufacturers' light bulbs and other lighting solutions:

Ohio lighting manufacturers supply many big box retailers, like Lowe's, Target, Home Depot, and Walmart. Energystar.gov can help you find a retailer selling Energy Star-approved bulbs: http://www.energystar.gov/index.cfm?fuseaction=store.store_locator.

How to get the best bang for your buck:

Largely due to S.B. 221, Ohio utilities offer incentives on top of lower energy bills to help customers finance energy efficiency upgrades, including lighting. Visit the web pages below to find out how to take advantage of the incentives your utility offers for energy efficiency upgrades. Depending on your utility, incentives might include discounted energy-efficient bulbs, appliance rebates, money for your old, inefficient appliances, and others.

AEP customers:
https://aepohio.com/save/programs/In-homeEnergySavings/default.aspx

Duke customers:
http://www.duke-energy.com/ohio/savings/smart-saver.asp

Dayton Power & Light customers:
http://www.dpandl.com/save-money/residential/

FirstEnergy customers:
http://energysaveoh-business.com/slighting.html

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Can you tell the difference? New energy-efficient incandescent bulbs being manufactured by Ohio companies like GE and ADLT look just like traditional incandescents and emit the same quality of light—just more efficiently. Top image: high-efficiency bulb on right; old-fashioned incandescent bulb on left. Lower image: The light qualities of ADLT's high-efficiency incandescent bulb, shown in right lamp, are nearly identical to those of a conventional incandescent (left).

Endnotes

1 Business and Industry | Global Markets, Ohio Department of Development (accessed December 7, 2011).

2 Brookings Institution & Battelle's Technology Partnership, Sizing the Clean Economy: A National and Regional Green Jobs Assessment, July 2011, via http://www.brookings.edu/~/media/Files/Programs/Metro/clean_economy/0713_clean_economy.pdf, p. 4, (accessed December 20, 2011).

3 Ibid.

4 NRDC, Energy Facts: Better Light Bulbs Equal Consumer Savings in Every State, July 2011, via http://www.nrdc.org/energy/files/betterbulbs.pdf, (accessed December 20, 2011).

5 Gold, Rachel & Nadel, Steven (ACEEE). Appliance and Equipment Standards Jobs: A Moneymaker and Job Creator in all 50 States, p. 2, May 2011.

6 NRDC, Legislative Facts: Oppose Efforts to Roll Back Light Bulb Efficiency Standards, March 2011, via http://www.nrdc.org/legislation/files/LightBulbEfficenencyRepeal.pdf, (accessed December 20, 2011).

7 NRDC, Energy Facts: Better Light Bulbs Equal Consumer Savings in Every State, July 2011.

8 NRDC, Legislative Facts: Oppose Efforts to Roll Back Light Bulb Efficiency Standards, March 2011.

9 NRDC, The Facts about Light Bulbs and Mercury, via http://www.nrdc.org/legislation/files/lightbulbmercury.pdf, (accessed December 20, 2011).

10 NRDC, Legislative Facts: Oppose Efforts to Roll Back Light Bulb Efficiency Standards, March 2011.

11 Wendy Koch, "Poll: Americans OK with newer light bulbs," *USA Today*, February 17, 2011, via http://content.usatoday.com/communities/greenhouse/post/2011/02/poll-americans-ok-newer-light-bulbs/1, (accessed December 20, 2011).

12 NRDC, "New Poll Reveals Nearly 75% of Ohio Voters Support the Use and Expansion of Energy Efficiency Technologies," September 15, 2011, available via http://www.nrdc.org/media/2011/110915a.asp (accessed December 16, 2011).Poll: Americans OK with newer light bulbs

13 Ibid.

14 GE Lighting, The GE energy smart LED, via http://www.gelighting.com/na/energysmartLED/home.html, (accessed December 20, 2011).

15 Energy Star Building Manual, Chapter 6: Lighting, via http://www.energystar.gov/ia/business/EPA_BUM_CH6_Lighting.pdf, p. 3, (accessed December 7, 2011).

For more information, including NRDC's reports, fact sheets and materials, on new energy-efficient light bulbs available to consumers and businesses, please visit http://www.nrdc.org/energy/lightbulbs/.

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