

ID# CU55

PUBLISHED ON
OCTOBER 21, 2011

Selling CFLs at Wal-Mart

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Introduction

In March 2009, Andy Barron, Wal-Mart's senior vice president for hardlines merchandising, had some concerns about his lighting business. Previously, he had helped Wal-Mart achieve an ambitious goal for this division: selling 100 million energy-efficient CFL (compact fluorescent light) bulbs by year end 2007 as part of the company's new sustainability program (see Exhibit 1). Through innovative merchandising, strategic pricing, and an unprecedented consumer education partnership between Wal-Mart, Yahoo!, the Department of Energy's ENERGY STAR program, and environmental non-profits, Barron had been able to reach his CFL sales goal three months early.¹ But he was concerned: revenue growth had fallen off during 2008 and the outlook for full year 2009 sales was uncertain. Given the visibility that CFL adoption had both within Wal-Mart and as part of the company's public image, Barron thought it important to meet his lighting business goals for the year. He decided to re-examine the dynamics of the CFL marketplace to determine what barriers to purchase needed to be overcome . . . and what opportunities could be seized.

CFL and Technology Use

The energy-saving compact fluorescent light bulb was first invented in the 1970s as a response to the 1973 oil crisis. CFLs were introduced for consumer use in 1980, but large-scale production was limited due to the high cost of constructing factories to accommodate the new design. When concerns about energy dependency on foreign oil and global warming mounted in the 1990s, greater attention was given to CFLs. Major companies such as GE, Philips, and Osram Sylvania ramped up CFL production. The bulbs became more widely available and were sold in the same retail outlets that offered traditional incandescent bulbs, including hardware stores, supermarkets, home improvement centers, discount retailers, and online retailers.

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Acknowledgements

Kate Permut '83 provided research and writing support for this case.

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CFLs were initially quite expensive, as much as \$25 each, but the product offered consumers great savings on their household energy bills.² On average a CFL bulb used 75% less electricity than an incandescent bulb and lasted 10 times longer, usually five to seven years.³ Because CFLs used less wattage, each bulb saved consumers, on average, \$30 a year on their electric bills and produced 450 pounds fewer greenhouse gases from power plants over its lifetime.⁴ Because the average household had 45 light bulb sockets, this could mean hundreds of dollars in savings, even if just a few of a home's incandescent bulbs were switched.⁵

Given these financials, the CFL bulb was a consumer purchase that clearly paid for itself—and industry manufacturers expected demand to skyrocket. The number of CFL models proliferated from 1999 to 2008 (see Exhibit 2). Designers developed bulbs in new shapes and sizes (see Exhibit 3) as CFL technology became well integrated into the residential lighting industry.

Barron had been offering CFLs at Wal-Mart for some time and knew that prices were declining. Where CFLs averaged \$15 per bulb in the 1990s, the consumer cost was down to single digits in the mid 2000s. By 2009, the price for one CFL bulb averaged \$3, but the unit price could range from \$1 to \$6 depending on the discount outlet, manufacturer rebate, whether the product was purchased in bulk, and whether sales promotions were offered.⁶ As the price per unit dropped, the payback period for consumers grew ever shorter (see Exhibit 4).

Utility companies also had an interest in getting consumers to switch to the new bulbs. In 2007, household lighting accounted for 14% of America's total electricity consumption.⁷ CFLs promised to reduce that number significantly. Energy companies joined with retailers to promote the product switch, offering their own coupons, trade-ins, and price promotions to entice consumers to install CFLs.

These initiatives had some success, as the CFL share of household lamps reached 24% in 2008.⁸ But an even more powerful player was active in the drive to increase the number of CFLs in American households—the US government and its nationwide ENERGY STAR program.

US Government Programs and Policies

Safety standards, utility price regulation, and government oversight had long been part of the electrical industry. In 1991, a new consumer education project was launched when the US Department of Energy and the US Environmental Protection Agency joined together to create the ENERGY STAR program. This initiative promoted energy conservation across all types of household appliances and technologies, bestowing the ENERGY STAR logo on items that used 20% to 30% less energy than required by federal standards. CFLs met this goal and the US government made a significant effort during the 2000s to increase consumer usage of the energy efficient bulbs. ENERGY STAR research and education on energy-related

household expenditures helped consumers track where their energy dollars were being spent (see Exhibit 5).

The impact of ENERGY STAR's efforts could be significant. On the program's website, consumers could see the direct benefits of using CFLs:

The smallest things can add up to a real difference. We encourage you to change out the light fixtures or bulbs at home that you use most with ENERGY STAR qualified models. If every American home replaced their five most frequently used light fixtures or the bulbs in them with ones that have earned the ENERGY STAR, we would save close to \$8 billion each year in energy costs, and together we would prevent the greenhouse gases equivalent to the emissions from nearly 10 million cars. FACT: The energy used in the average home can be responsible for more than twice the greenhouse gas emissions of the average car. When you use less energy at home, you reduce greenhouse gas emissions from power plants and help protect our environment from the risks of global climate change.⁹

Federal tax policies were also used to incentivize energy-efficient households. Barron was aware of the new the American Recovery and Reinvestment Act passed in February 2009. The Act provided homeowners with a federal tax credit of 30% of costs (up to \$1500) for undertaking home improvements to reduce energy costs. The previous maximum had been \$500 under earlier incentive programs. CFL purchases, and any related bulb installation costs, now qualified under the Act and could be deducted from a consumer's annual federal tax payment.

Barron also had to keep up with the federal regulations and policies that specifically addressed the light bulb industry. The 2007 Energy Independence and Security Act required that general purpose light bulbs become 30% more energy efficient than incandescent bulbs by 2010. Contrary to some statements by politicians, the law did not ban incandescent bulbs. Instead, the legislation included an escalating energy-efficiency standard. It required that consumer-marketed general purpose bulbs (including incandescent bulbs, CFLs, LEDs, and any new lighting technologies yet to be invented) become 70% more efficient by 2020. This was particularly daunting for incandescent bulb manufacturers because, unless they came up with a significant technological breakthrough, they would be hard pressed to meet the requisite efficiency levels. The challenge was different for other manufacturers: LED screw-in bulbs consumed 80% less energy and had a very long life cycle (50,000 hours, meaning 10 to 30 years depending on use). But at \$40 to \$110 apiece, the LED bulbs were too pricey for most consumers. Industry experts predicted LED bulbs would be at half that cost within two years, but the difficulty in meeting both consumer price expectations and federal efficiency standards remained.¹⁰

Given Wal-Mart's global reach, Barron also kept track of regulations imposed on lighting products in other countries. A ban on incandescent bulbs had been passed in Australia in 2007 and was set to go into effect in 2010. In 2008 the 27 members of the European Union had

adopted the ban on incandescent bulbs too.¹¹ Japan declared a ban on traditional bulbs starting in 2012. Given these developments, several manufacturers such as Toshiba were planning to stop production of incandescent bulbs altogether.

The Consumer Experience

Barron was aware of market research that showed many consumers holding misperceptions about CFLs. When these shoppers thought of CFLs, they wrongly thought of the harsh fluorescent lighting ceiling fixtures they saw in schools and businesses. The first CFLs introduced to the consumer marketplace in the 1980s also had a variety of usage problems that would be difficult for early adopters to forget: the bulbs took a long time to warm up; they often buzzed or flickered as they wore out; they could not be used with a dimmer switch; and the promised level of household energy savings was only achieved if the bulbs experienced continuous use. Moreover, strict, inconvenient recycling procedures were required to dispose of the new bulbs due to the mercury contained inside.

Thus despite promised household savings of \$350 per year (if an entire house converted to CFL usage), adoption slowed.¹² New CFL models fixed many of the problems of the initial designs, but consumer complaints regarding unflattering white light, strange bulky shapes, and fears of mercury poisoning received a great deal of media attention.

A nationwide study in 2008 found that 26% of households accounted for 76% of all CFLs in residential use,¹³ and that 50% of US households had no CFLs at all (see Exhibit 6). What Barron found most relevant was that higher CFL usage was correlated with higher levels of income, education, and age. Non-CFL users were more likely to be on the lower end of the income, education, and age scales; more likely to rent; more likely to live in multi-family dwellings; and more likely to have occupied their residence one year or less.¹⁴ However, the impact of local utility promotional programs was clearly seen in states such as Delaware and California, where both high and low income consumers had adopted the technology. The report showed that once a consumer installed a single CFL bulb, their likelihood of purchasing CFLs again in the next year more than doubled.

Wal-Mart's Challenge

By the first quarter of 2009, the light bulb industry had undergone further changes. CFL manufacturers had redesigned the bulbs and addressed the major customer concerns. Mercury levels were greatly reduced and recycling instructions simplified. Dimmer capability, more sizes for different household fixtures, and a variety of color spectrums were now available. Many businesses, utilities, government agencies, and non-profits were educating consumers about energy costs, offering interactive tools to calculate personal savings from CFLs (see Exhibit 7).

The CFL market had huge upside potential. While the average US house used 45 light bulbs, some larger residences had up to 100 sockets. US consumers bought 5.5 million light bulbs each day, totaling two billion bulbs each year. Of the 4.7 billion lamp sockets in the country,

only one in six was filled with a CFL.¹⁵ And the impact of the CFL's long life on replacement sales had yet to be felt.¹⁶

However, the global economic downturn of 2008 was having an impact on retail. The average CFL unit cost of \$3.00 was well above the average \$.50 price of an incandescent bulb.¹⁷ The incandescent segment of household lamp sales reversed its trend of losing market share to CFLs during the fourth quarter of that year¹⁸ (see Exhibit 8).

Given the rapidly evolving marketplace, Barron considered his options. His 2007 CFL promotional programs had been a big success (see Exhibit 9). In 2008 Wal-Mart accounted for 41% of all CFL shipments in the entire United States.¹⁹ But Barron's business challenges remained the same: What could be done to accelerate the US consumer's adoption of CFLs? How could he meet his objectives for increased CFL sales at Wal-Mart stores across the United States?

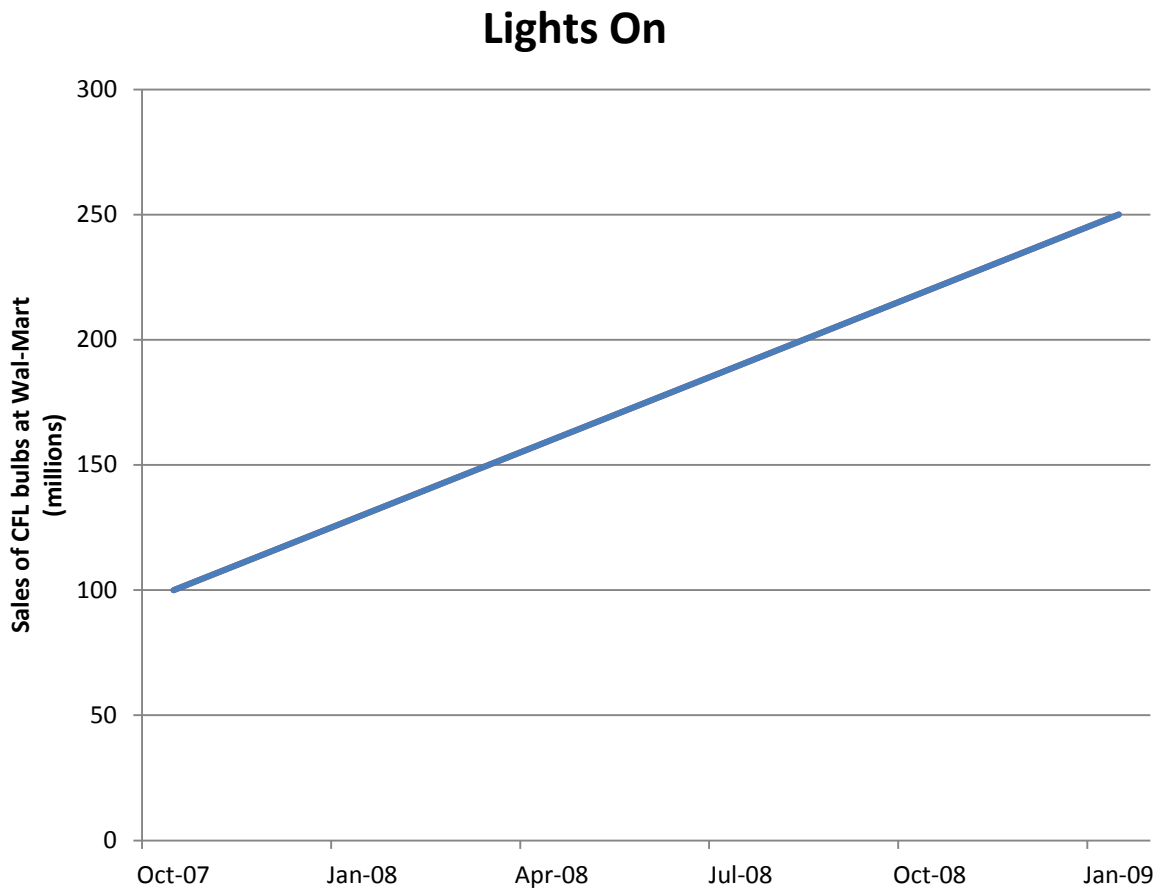
Questions for Discussion

1. What are the advantages and disadvantages of CFLs to the US consumer? How do you characterize these factors?
2. What are some of the sources of resistance to CFL adoption from the consumer's perspective?
3. If you were managing the lighting product category for Wal-Mart, how might you increase sales, particularly in light of 1 and 2 above?
4. How might an interested third party such as electric utilities be more involved in the adoption of CFL bulbs? What is their specific interest? How might they participate in the issues surrounding CFL adoption?
5. What role can government regulation play in driving greater consumer adoption? What are the options that local, state, and federal regulators have to help create CFL demand?

Exhibits

Exhibit 1

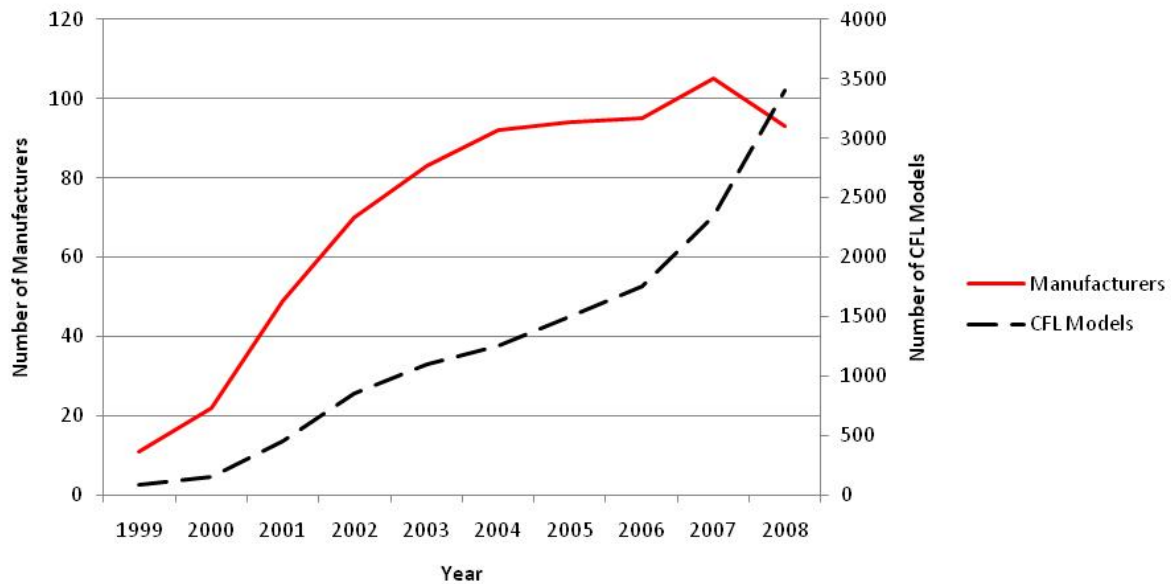
Wal-Mart Cumulative Fluorescent Light Bulb Sales October 2007–January 2009



Source: Stephanie Rosenbloom and Michael Barbaro, “Green Light Specials, Now at Wal-Mart,” *New York Times*, January 24, 2009.

Exhibit 2

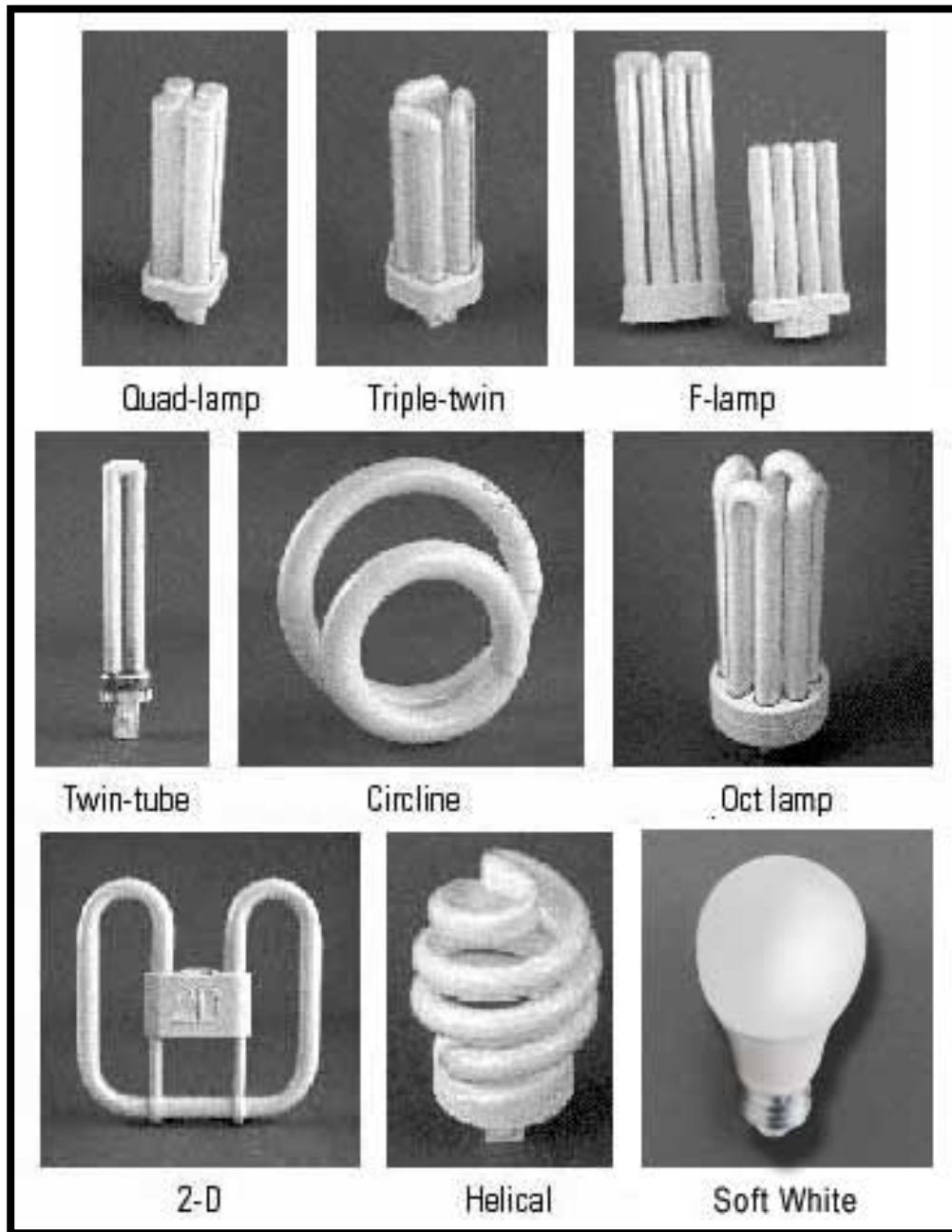
CFL Manufacturers and Models by Year



Source: US Department of Energy, "Big Results, Bigger Potential," ENERGY STAR CFL Market Profile, March 2009, page 4,
http://www.energystar.gov/ia/products/downloads/CFL_Market_Profile.pdf.

Exhibit 3

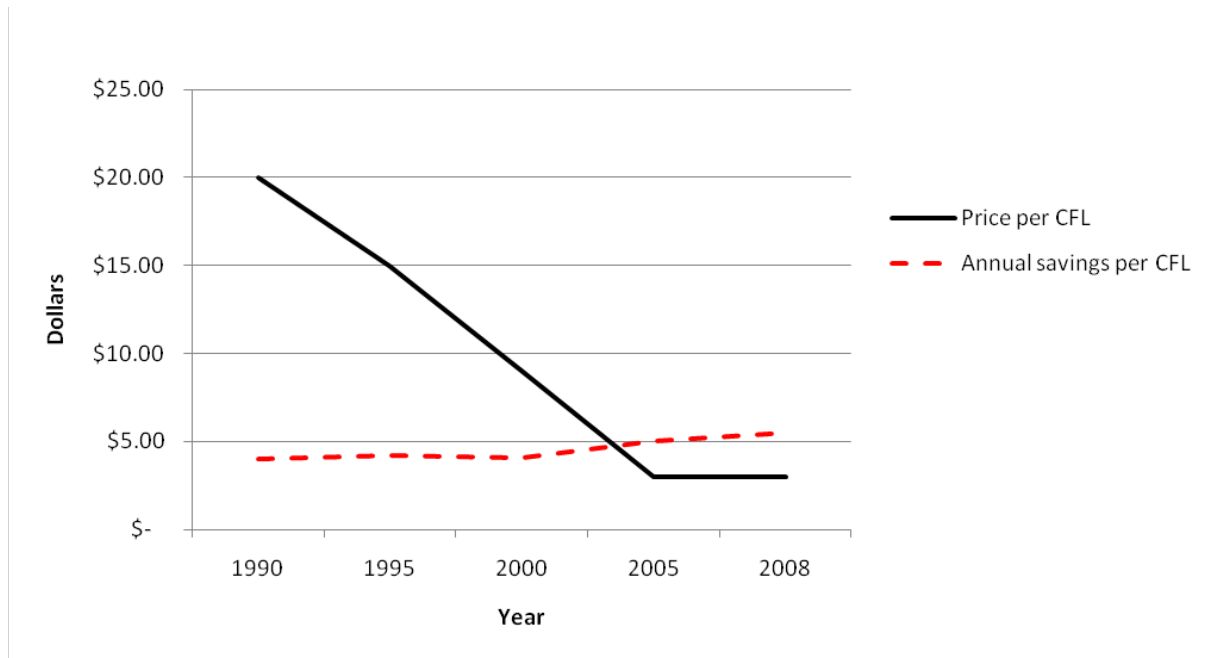
CFL Models



Source: "Compact Fluorescent Lamps," Madison Gas & Electric, photo courtesy of Philips, http://www.mge.com/business/saving/madison/pa_2.html.

Exhibit 4

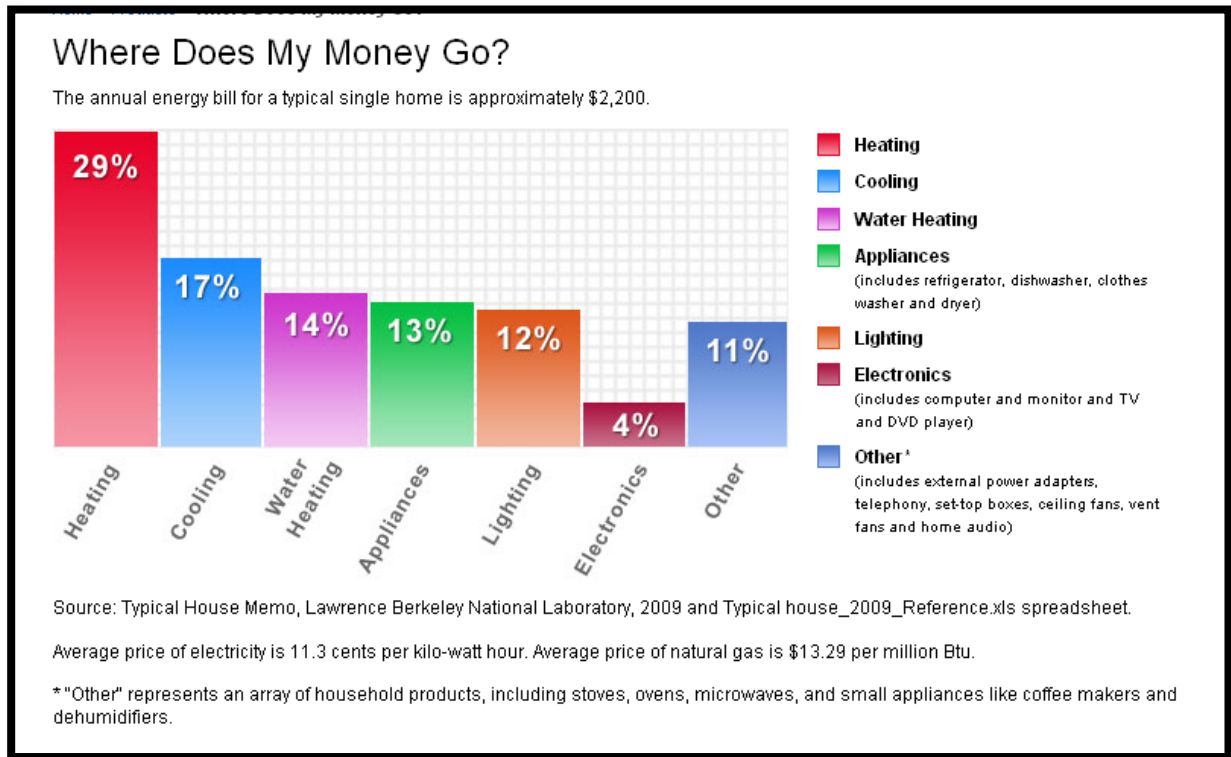
Trend in CFL Prices and Annual Energy Cost Savings



Source: US Department of Energy, "Big Results, Bigger Potential," ENERGY STAR CFL Market Profile, March 2009, http://www.energystar.gov/ia/products/downloads/CFL_Market_Profile.pdf.

Exhibit 5

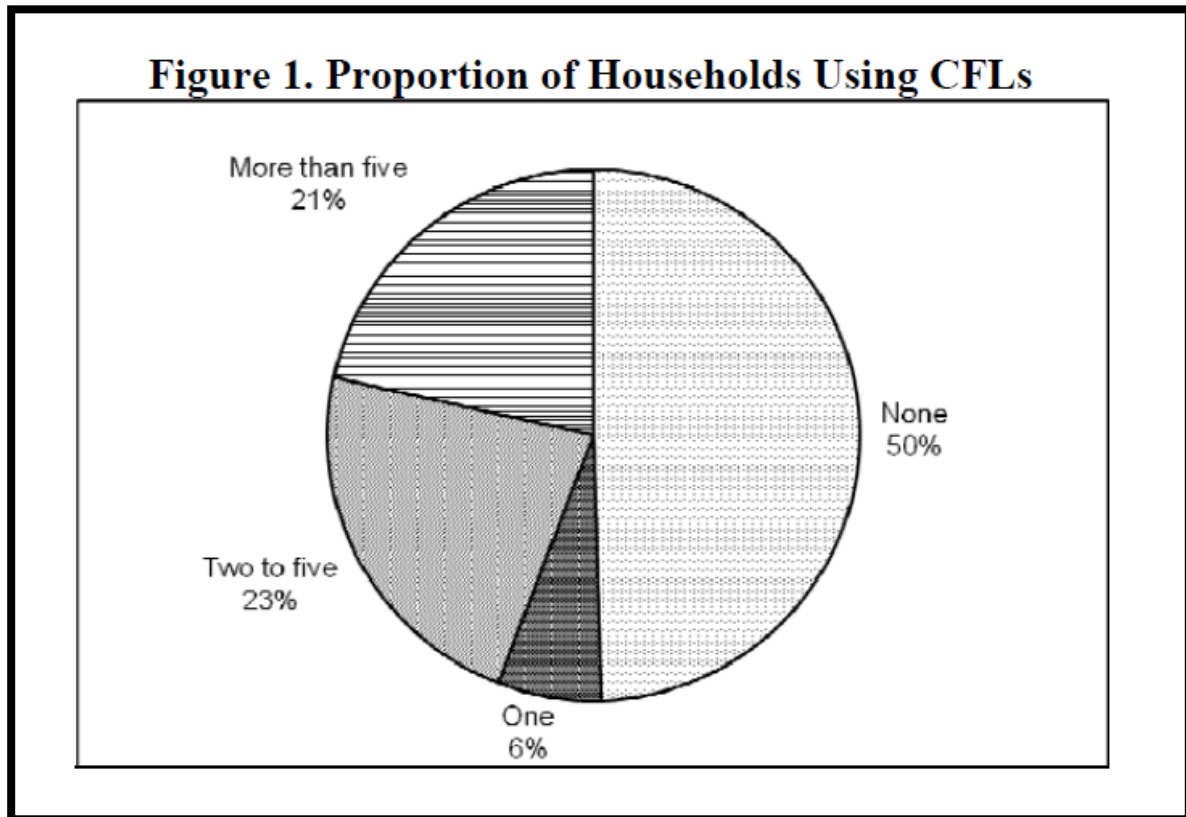
Prototypical Consumer Energy Costs



Source: "Where Does My Money Go?" ENERGY STAR website, August 4, 2011, http://www.energystar.gov/index.cfm?c=products.pr_where_money.

Exhibit 6

Proportion of US Households Using CFLs in 2008



Source: Michael Reid, "Who's Buying CFLs? Who's Not Buying Them? Findings from a Large-Scale, Nationwide Survey," (paper, Association of Computer Electronics and Electrical Engineers Summer Study on Energy Efficiency in Buildings, Summer, 2008) p. 2-260, http://www.eceee.org/conference_proceedings/ACEEE_buildings/2008/Panel_2/2_263.

Exhibit 7

Payback Calculator

Products that earn the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
www.energystar.gov

CHANGE FOR THE BETTER WITH ENERGY STAR

Life Cycle Cost Estimate for 1 ENERGY STAR Qualified Compact Fluorescent Lamp(s)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors. CFLs are available in a variety of shapes and sizes, but pricing in this calculator is based on the most common spiral or globe with standard screw-in base.

Enter your own values in the gray boxes or use our default values.

Number of units	1
Electricity Rate (\$/kWh)	\$ 0.113
Hours used per day	3

	ENERGY STAR Qualified Unit	Conventional Unit
Initial cost per unit (estimated retail price)	\$3.40	\$0.60
Wattage (watts)	15	60
Lifetime (hours)	10,000	1,000

*ENERGY STAR wattage is calculated based on the wattage selected for the incandescent unit, user can enter an alternative value if desired.

Annual and Life Cycle Costs and Savings for 1 CFLs

	1 ENERGY STAR Qualified Units	1 Conventional Units	Savings with ENERGY STAR
Annual Operating Costs*			
Energy cost	\$2	\$7	\$6
Maintenance cost	\$0	\$4	\$4
Total	\$2	\$11	\$9

EnergySavers.coop > Products > CFL Selector > Resources and FAQs > Payback Calculator

Payback Calculator

Compact Fluorescents: They don't cost, They PAY!

Enter values in yellow form fields:

Cost of electricity: 8.4 cents per kWh

Hours used per day: 3 hours

Regular (incandescent) bulb:	New CFL:
Power consumed: 60 watts	Power consumed: 14 watts
Cost of bulb: \$0.50	Cost of bulb: \$2.20
Lamp life: 750 hours	Lamp life: 10,000 hours
Lamp life: 8 months	Lamp life: 9.1 years
Annual energy cost: \$5.52	Annual energy cost: \$1.29
Total bulbs required: 13 bulbs	Total bulbs required: 1 bulb

Total cost of bulbs and energy: \$56.90 minus \$13.96= a \$42.94 payback on \$1.70 invested!

The difference in the cost between the two bulbs is \$1.70. If you invest that now, it will put \$4.23 back in your pocket every year, for a total of \$42.94 during the 9.1 year life of your investment.

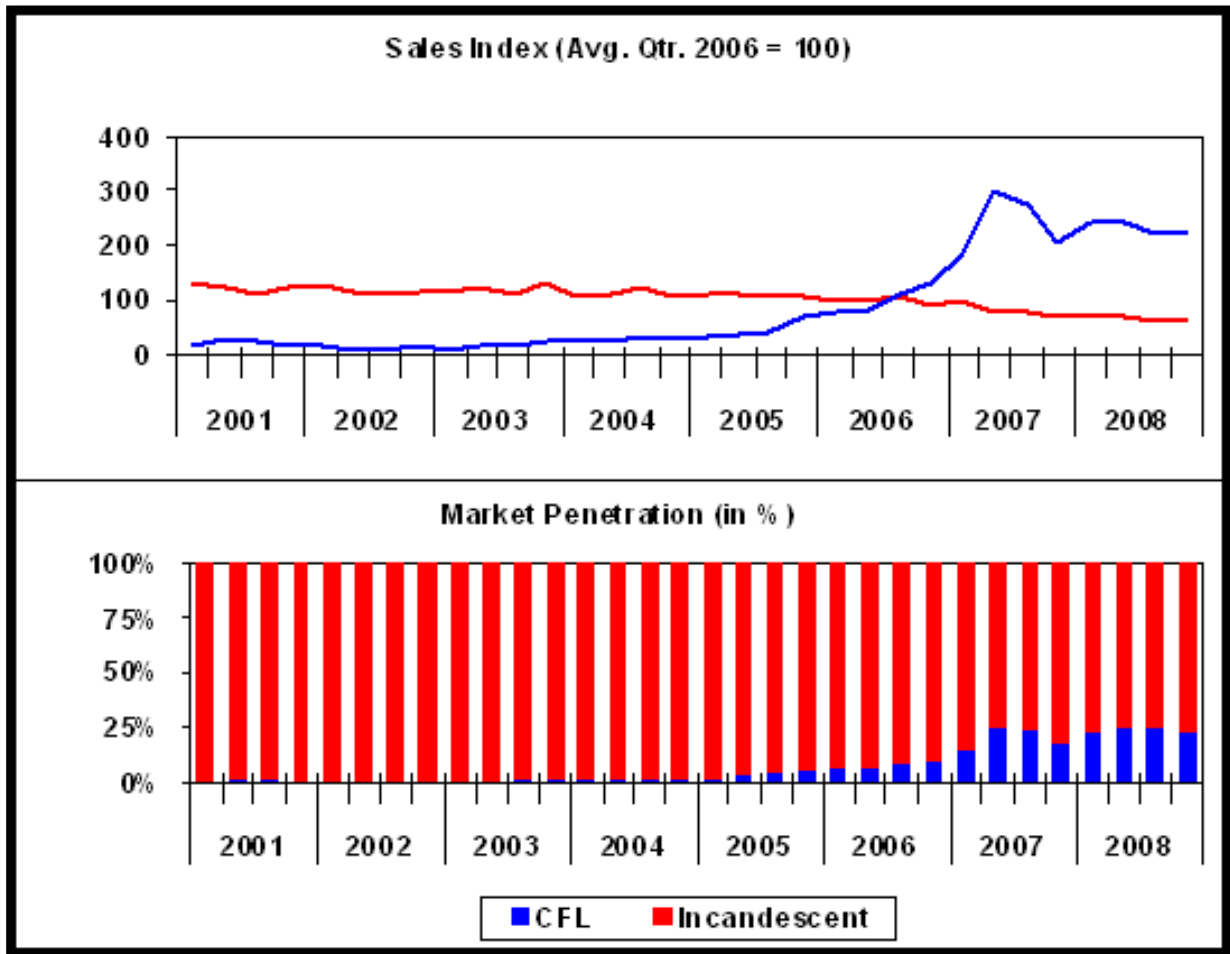
That is equal to earning a 277% annual return on your \$1.70 investment!

[Recalculate](#)

Source: "Payback Calculator," EnergySavers.coop, <http://www.energysavers.coop/products/cfl-selector/resources-and-faqs/payback-calculator/?AFFID=11453>.

Exhibit 8

Consumer Use of CFLs 2001–2008



Source: National Association of Electrical and Medical Equipment Manufacturers, "More Consumers Shifting to Incandescent Lamps as Economy Weakens," press release, February 4, 2009, <http://www.nema.org/media/pr/20090204a.cfm>.

Exhibit 9

Wal-Mart 2007 CFL Promotion Programs

- Introduce a private label CFL at Wal-Mart under the Great Value brand that retails at four bulbs for the cost of three regularly priced brand name CFLs;
- Offer online orders at both www.walmart.com and www.samsclub.com, and put an online savings calculator on the Sam's Club Web site;
- Increase shelf space, offer more selection and move bulbs to eye level for easiest access;
- Install interactive displays in select Wal-Mart stores to allow customers to compare qualities and styles, and demonstrate the potential savings associated with each type of CFL;
- Work with manufacturers to lower the mercury content of the CFLs sold at Wal-Mart stores and Sam's Clubs, making them safer and more efficient;
- Partner with Yahoo!, Lawrence Bender, the Department of Energy's ENERGY STAR program, Environmental Defense and hundreds of others on the 18Seconds movement to promote energy efficiency.

Source: Wal-Mart, "Wal-Mart Surpasses Goal to Sell 100 Million Compact Fluorescent Light Bulbs Three Months Early," press release, October 2, 2007, <http://walmartstores.com/pressroom/news/6756.aspx>.

Endnotes

¹ Wal-Mart, “Wal-Mart Surpasses Goal to Sell 100 Million Compact Fluorescent Light Bulbs Three Months Early,” press release, October 2, 2007, <http://walmartstores.com/pressroom/news/6756.aspx>.

² Blaine Harden, “Fluorescent Bulbs Are Known to Zap Domestic Tranquility,” *Washington Post*, April 30, 2007.

³ Michael Barbaro, “Wal-Mart Puts Some Muscle Behind Power-Sipping Bulbs,” *New York Times*, January 2, 2007.

⁴ Barbaro, “Wal-Mart Puts Some Muscle Behind Power-Sipping Bulbs.”

⁵ Emily Masamitsu, “The Best Compact Fluorescent Light Bulbs: PM Lab Test,” *Popular Mechanics*, May 1, 2007, <http://www.popularmechanics.com/home/reviews/news/4215199>.

⁶ US Department of Energy, “Big Results, Bigger Potential,” ENERGY STAR CFL Market Profile, March 2009, page 4, http://www.energystar.gov/ia/products/downloads/CFL_Market_Profile.pdf.

⁷ “FAQs: Electricity,” US Energy Information Administration, <http://www.eia.gov/tools/faqs/index.cfm#electricity>.

⁸ “More Consumers Shifting to Incandescent Lamps as Economy Weakens,” *National Electrical Manufacturers Association News*, February 4, 2009, <http://www.nema.org/media/pr/20090204a.cfm>.

⁹ www.energystar.gov

¹⁰ Carl-Gustav Linden, “LED Light Bulbs: Are You Ready to Make the Switch?” in Green Tech, *CNET News*, April 22, 2008, http://news.cnet.com/8301-11128_3-9923048-54.html.

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¹² 18seconds.org, as of August 2011, <http://green.yahoo.com/18seconds/>.

¹³ Michael Reid, “Who’s Buying CFLs? Who’s Not Buying Them? Findings from a Large-Scale, Nationwide Survey,” (paper, Association of Computer Electronics and Electrical Engineers Summer Study on Energy Efficiency in Buildings, Summer, 2008) p. 2-258, http://www.eceee.org/conference_proceedings/ACEEE_buildings/2008/Panel_2/2_263.

¹⁴ Reid, “Who’s Buying CFLs?” page 2-263.

¹⁵ US Department of Energy, “Big Results, Bigger Potential,” page 5.

¹⁶ Charles Fishman, “How Many Light Bulbs Does It Take to Change the World? One. And You’re Looking at It,” *Fast Company*, December 19, 2007, http://www.fastcompany.com/magazine/108/open_lightbulbs.html.

¹⁷ Fishman, “How Many Light Bulbs Does It Take?”

¹⁸ National Association of Electrical and Medical Equipment Manufacturers, “More Consumers Shifting to Incandescent Lamps as Economy Weakens,” press release, February 4, 2009, <http://www.nema.org/media/pr/20090204a.cfm>.

¹⁹ US Department of Energy, “Big Results, Bigger Potential,” page 3.