

INNOVATION. PERFORMANCE. SAVINGS.  
ENERGY STAR® Makes It Simple.



ENERGY STAR® QUALIFIED  
LIGHT BULBS

2006 PARTNER RESOURCE GUIDE



ENERGY STAR

## SECTION I : CONSUMER INFORMATION



ENERGY STAR is a government-backed program that helps consumers identify the most energy-efficient products.

This document is designed to help you promote ENERGY STAR qualified light bulbs.

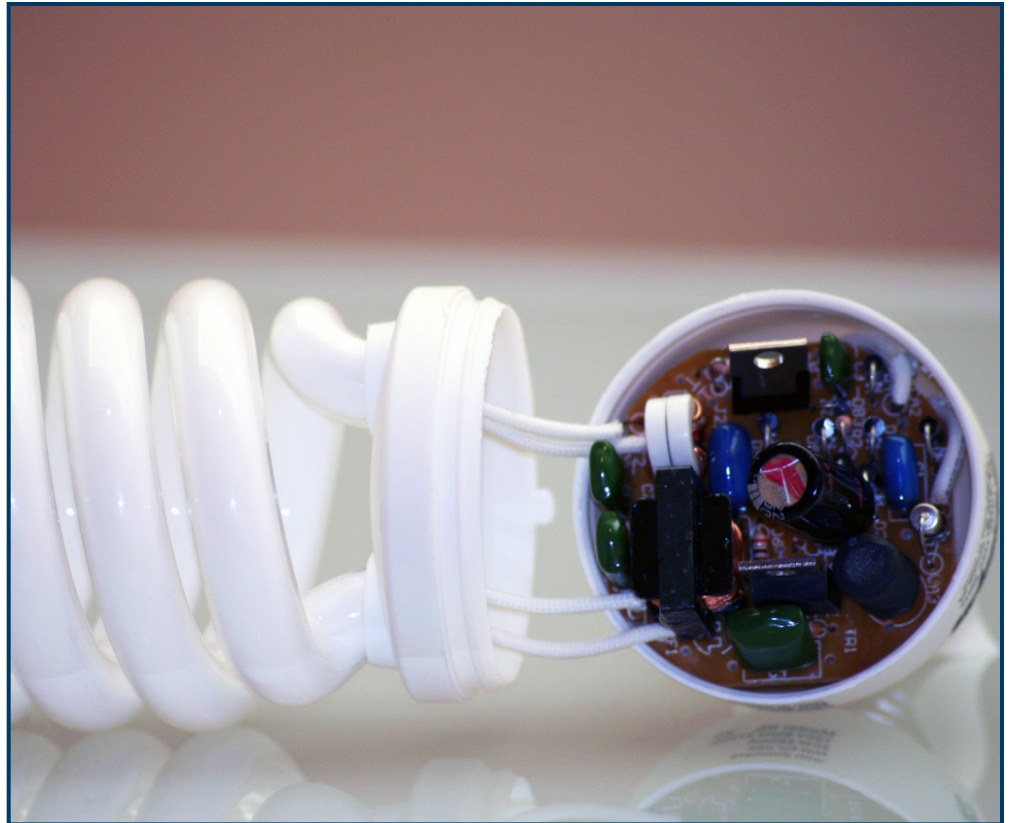
- Section I includes the latest consumer messaging on product features and benefits, as well as fun facts and usage tips.
- Section II summarizes the most recent data on ENERGY STAR market share, ENERGY STAR criteria, energy savings, and cost-effectiveness.

### ADVANCED TECHNOLOGY

ENERGY STAR qualified light bulbs use innovative technology to produce light in a very efficient way. Electricity creates a chemical reaction among gases located inside the glass tube, causing special phosphors to illuminate. This means ENERGY STAR qualified light bulbs are at least *three times* more efficient than regular bulbs.

### DID YOU KNOW?

Incandescent light bulbs were invented by Thomas Edison in 1879, and the basic design has not changed much since. These bulbs are very inefficient, converting only 10% of the electricity consumed into visible light. The remaining 90% of the electricity is actually released as heat!<sup>1</sup>



Take a look! ENERGY STAR qualified light bulbs use sophisticated electronic circuitry to generate light. All you have to do is change the bulb. ENERGY STAR makes it simple.







## ENJOY ENERGY SAVINGS AND MORE!

The average U.S. household has more than 40 sockets for light bulbs, ranging from table lamps to ceiling fixtures. Larger homes can have even more. Lighting accounts for about 20% of annual household electricity bills, or approximately \$200 per year.<sup>2</sup> Replacing incandescent bulbs with ENERGY STAR qualified light bulbs provides significant benefits for consumers:

- ### ■ SAVE TIME AND EFFORT

ENERGY STAR qualified light bulbs can last more than seven years, compared to about 11 months for an incandescent bulb—that's eight times longer!<sup>3</sup>

- ### ■ SAVE ENERGY AND MONEY

Over its lifetime, one ENERGY STAR qualified light bulb eliminates the need for eight incandescent bulbs and saves you more than \$30. By changing five bulbs to ENERGY STAR, you save more than \$150!<sup>4</sup>

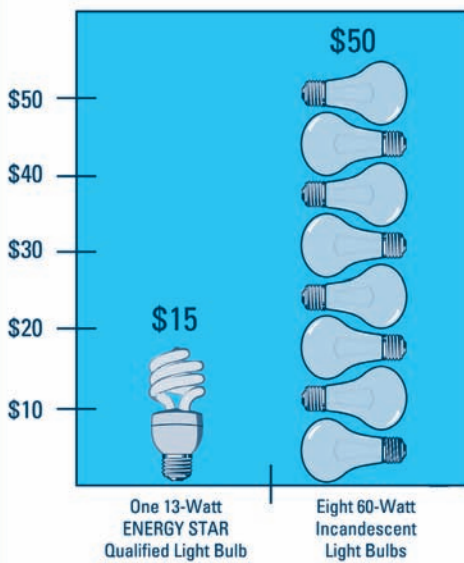
- ### ■ STAY COOL

Because ENERGY STAR qualified light bulbs run cooler, they make your home more comfortable. They are also safer to use in light fixtures that have delicate paper or fabric shades.

- ### ■ SAVE THE ENVIRONMENT

When you choose an ENERGY STAR qualified light bulb, you are making a difference for the environment by reducing air pollution and greenhouse gas emissions.

### LIFETIME COST ENERGY STAR® QUALIFIED LIGHT BULBS



Though incandescent light bulbs seem cheaper at the store, they'll actually hit your wallet harder in the long run.



ENERGY STAR qualified light bulbs are great in hard-to-reach places because they last so long.

## ARE YOU READY TO SWITCH TO ENERGY STAR?

Learn where to use and how to choose ENERGY STAR qualified light bulbs to maximize your satisfaction and savings. More choices are available now than ever before!

Common shapes include:

- Spirals and Mini-spirals
- Double, triple, and quadruple tubes
- Incandescent-shaped
- Covered globes and torpedo or bullet shaped, for decorative applications
- Reflectors



Today's ENERGY STAR qualified light bulbs come in many shapes and sizes designed to fit almost any type of fixture in your home—from the table lamp in your family room to the light on your porch.

## DID YOU KNOW?

ENERGY STAR qualified light bulbs run cool and will last longest when used in fixtures that have plenty of air flow.

## WHERE TO USE

**LET IT SHINE.** ENERGY STAR qualified light bulbs provide the greatest savings in fixtures that are on at least two hours per day. Put them where you leave the lights on the most in the evening, such as the family/living room, kitchen, dining room, and porch.

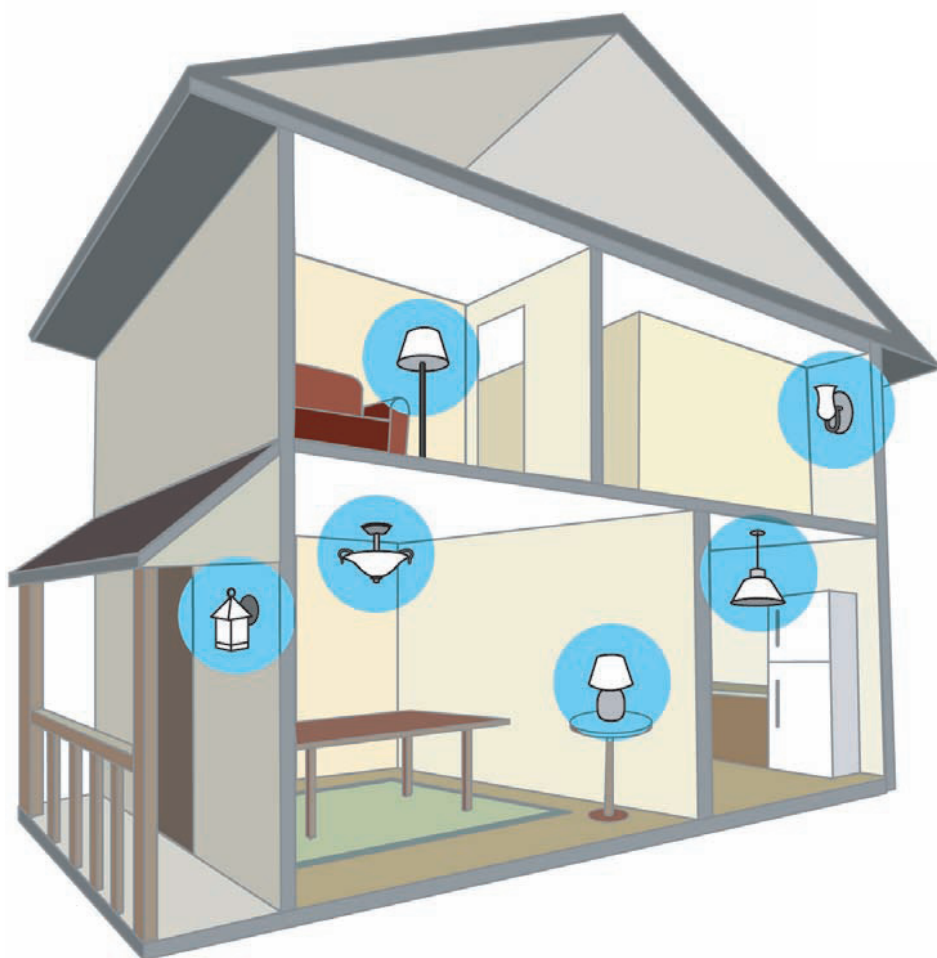
**LET IT FLOW.** ENERGY STAR qualified light bulbs perform best in open fixtures that allow airflow, such as table and floor lamps, wall sconces, pendants, and open ceiling fixtures.

**I'M SPECIAL.** If a light fixture is connected to a dimmer or three-way switch, you'll need to use a special ENERGY STAR qualified light bulb designed to work in these applications. Check the packaging for more information.



## WHERE TO USE

ENERGY STAR® QUALIFIED LIGHT BULBS



### WHICH ROOMS?

Where lights are on the most:

- Family and living room
- Kitchen
- Dining room
- Porch

### WHICH FIXTURES?

Open fixtures that allow air flow:

- Table lamps
- Floor lamps
- Wall sconces
- Pendants
- Open ceiling fixtures

If a light fixture is connected to a dimmer or three-way switch, do not place an ENERGY STAR qualified light bulb in the fixture unless it is labeled as appropriate for dimmers or three-way switches.



## DID YOU KNOW?

ENERGY STAR qualified light bulbs are available in a variety of shapes and sizes and can fit in many of the most common fixtures.


## HOW TO CHOOSE

Finding the right ENERGY STAR qualified light bulb for your home is easy! Just ask yourself:

- What shape and size of light bulb will fit the fixture?
- How much light do I need in the room?
- What color of light will look best?





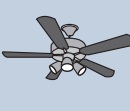


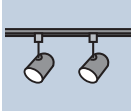




























## WHAT SHAPE AND SIZE?

Different fixtures need different types of bulbs. Using the chart below, find your fixture and then see which bulbs will work best.




# HOW TO CHOOSE

## THE RIGHT ENERGY STAR® QUALIFIED LIGHT BULB

	HARP SHADE	CLAMP SHADE	PENDANT FIXTURE	CEILING FIXTURE	CEILING FAN	WALL SCONCE	RECESSED CAN	TRACK LIGHTING	OUTDOOR COVERED	OUTDOOR EXPOSED
FOR THIS FIXTURE										
CHOOSE THIS BULB	  		   	   	   	 	  		  	

**NOTE:** If your fixture is connected to a dimmer or three-way switch, do not place an ENERGY STAR qualified light bulb in the fixture unless it is labeled as appropriate for dimmers or three-way switches.


CHANGE FOR THE BETTER WITH ENERGY STAR





## WHAT IS A LUMEN ANYWAY?

A lumen is actually the measurement of light output. Unlike watts, which measure the power consumed by the bulb, lumens indicate the amount of light you are getting.

## HOW MUCH LIGHT?

To choose the ENERGY STAR qualified light bulb with the right amount of light, find a bulb that is labeled as equivalent to the incandescent bulb you are replacing. Light bulb manufacturers include this information right on the product packaging to make it easy for consumers to choose the equivalent bulb. Common terms include “Soft White 60” or “60 Watt Replacement.”

You can also check the lumen rating to find the right bulb. The higher the lumen rating, the greater the light output.

To determine which ENERGY STAR qualified light bulbs will provide the same amount of light as your current incandescent bulbs, consult the following chart:



Not too dark, not too bright—just right! Be sure to read the packaging to choose the right light.

## LIGHT OUTPUT EQUIVALENCY

INCANDESCENT BULBS (WATTS)	MINIMUM LIGHT OUTPUT (LUMENS)	COMMON ENERGY STAR QUALIFIED LIGHT BULBS (WATTS)
40	450	9 TO 13
60	800	13 TO 15
75	1,100	18 TO 25
100	1,600	23 TO 30
150	2,600	30 TO 52

## WHAT IS A KELVIN ANYWAY?

The color of light is often described using a term called color temperature, which is measured in degrees Kelvin or kelvin (K). Lower Kelvin numbers mean the light has a warmer color, while higher Kelvin numbers mean the light has a cooler color.

## COLOR MY ROOM

ENERGY STAR qualified light bulbs are available in many of the same colors as regular bulbs. Choose the color that works best in your room and provides the look you desire.

- Warm White
- Soft White
- Cool White
- Daylight

### WARM LIGHT

#### FOR WARM INVITING LIGHT:

choose an ENERGY STAR qualified light bulb that states "warm white" or "soft white" on the package, with a color temperature of 2700 to 3000K.



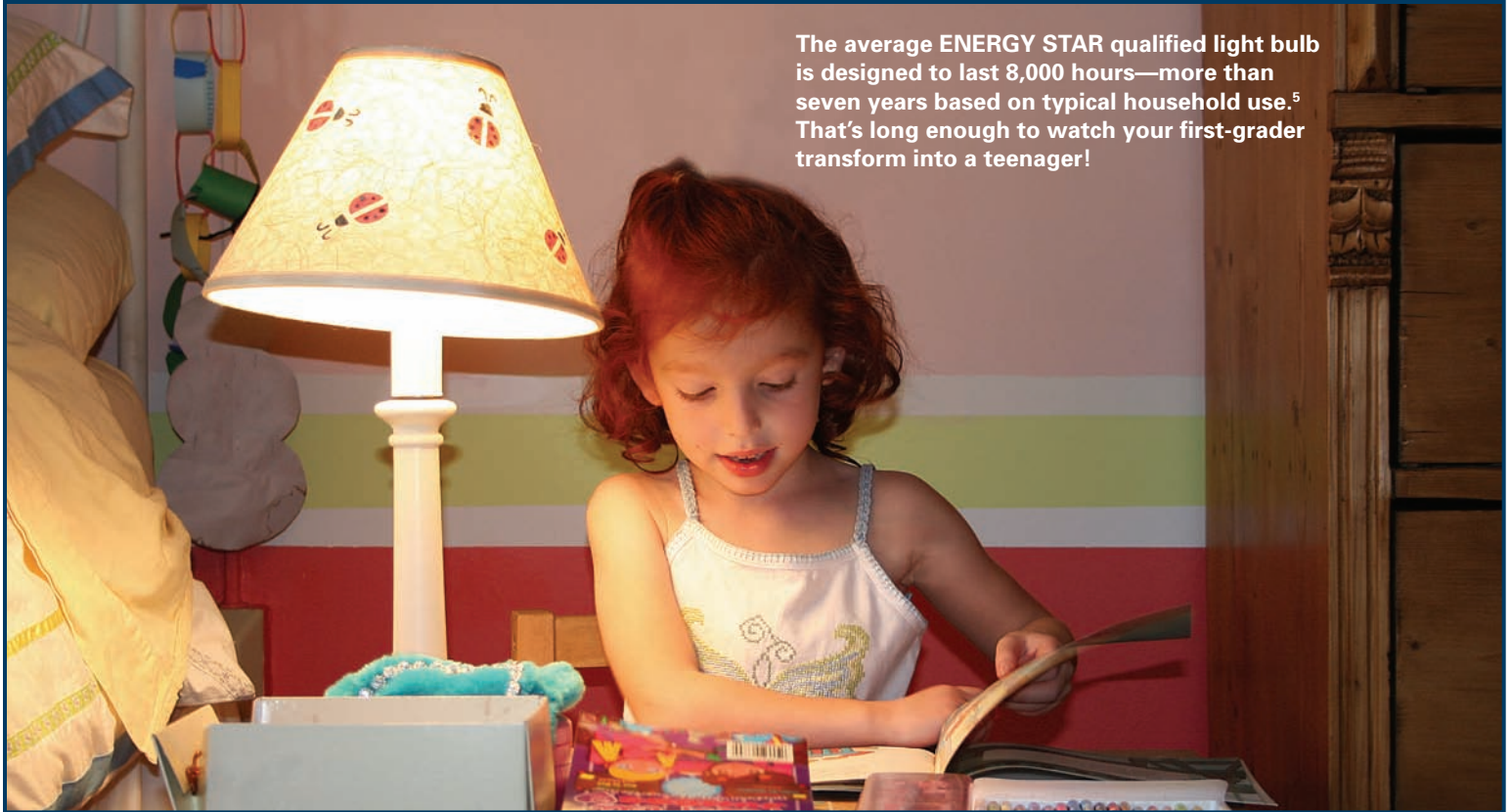
### COOL LIGHT

#### FOR COOL WHITE LIGHT:

choose an ENERGY STAR qualified light bulb that states "cool white" or "daylight" on the package, with a color temperature of 3500 to 6500K.







The average ENERGY STAR qualified light bulb is designed to last 8,000 hours—more than seven years based on typical household use.<sup>5</sup> That's long enough to watch your first-grader transform into a teenager!

## FUN FACTS

If you replace five regular light bulbs with ENERGY STAR qualified light bulbs, you'll save an average of 1,880 kWh over the lifetime of the bulbs. That's enough energy to:

- Run your ENERGY STAR qualified refrigerator for more than four years<sup>6</sup>
- Light your whole house for nearly 11 months<sup>7</sup>
- Light up more than 260 strings of holiday lights during the winter holiday season<sup>8</sup>

Five ENERGY STAR qualified light bulbs will save about \$190 in electricity costs over their lifetime. That's enough money to:

- Purchase at least one new ENERGY STAR qualified light fixture
- Buy more than 90 soft-serve ice cream cones<sup>9</sup>
- Buy enough candles for more than 60 romantic dinners<sup>10</sup>

An ENERGY STAR qualified light bulb will last eight times longer on average than an equivalent incandescent bulb. The long life will save you:

- Seven trips up a ladder to change out bulbs in hard-to-reach fixtures
- Seven bad jokes about "How many dads does it take to change a light bulb?"
- Seven renditions of "Honey, the light bulb's out again!"



## SECTION II : MARKET DATA



### DRIVING CONSUMER DEMAND

National market share of ENERGY STAR qualified light bulbs remains relatively small - less than five percent of total light bulb sales in 2005.<sup>11</sup> Tremendous opportunities exist to increase consumer awareness and transform the light bulb market.

Increasing the sales of ENERGY STAR qualified light bulbs will require effective consumer education. Educating consumers is a multi-step process, generally categorized into the following stages:

- 1. AWARENESS:** Consumers discover ENERGY STAR qualified light bulbs as an alternative to incandescent bulbs.
- 2. BENEFITS:** Consumers understand why ENERGY STAR qualified light bulbs are better for them.
- 3. WHERE TO USE:** Consumers learn that ENERGY STAR qualified light bulbs work best in fixtures that allow air flow and are on for at least two hours.
- 4. HOW TO CHOOSE:** Consumers know which bulbs to purchase for their lamps and fixtures.

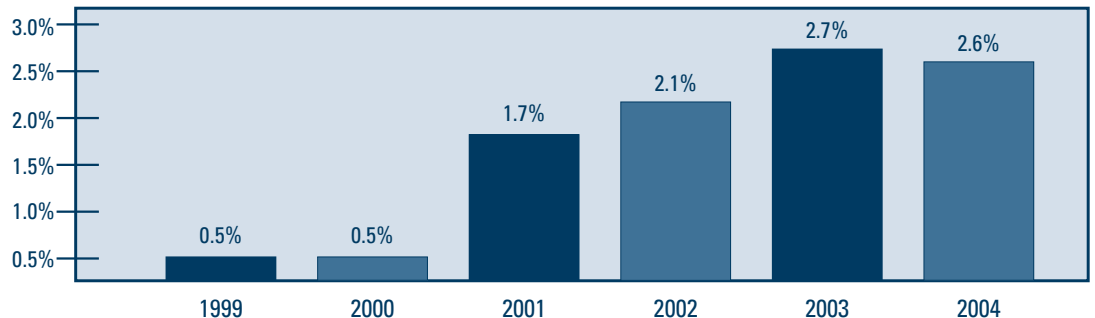
### ENERGY STAR MARKET SHARE

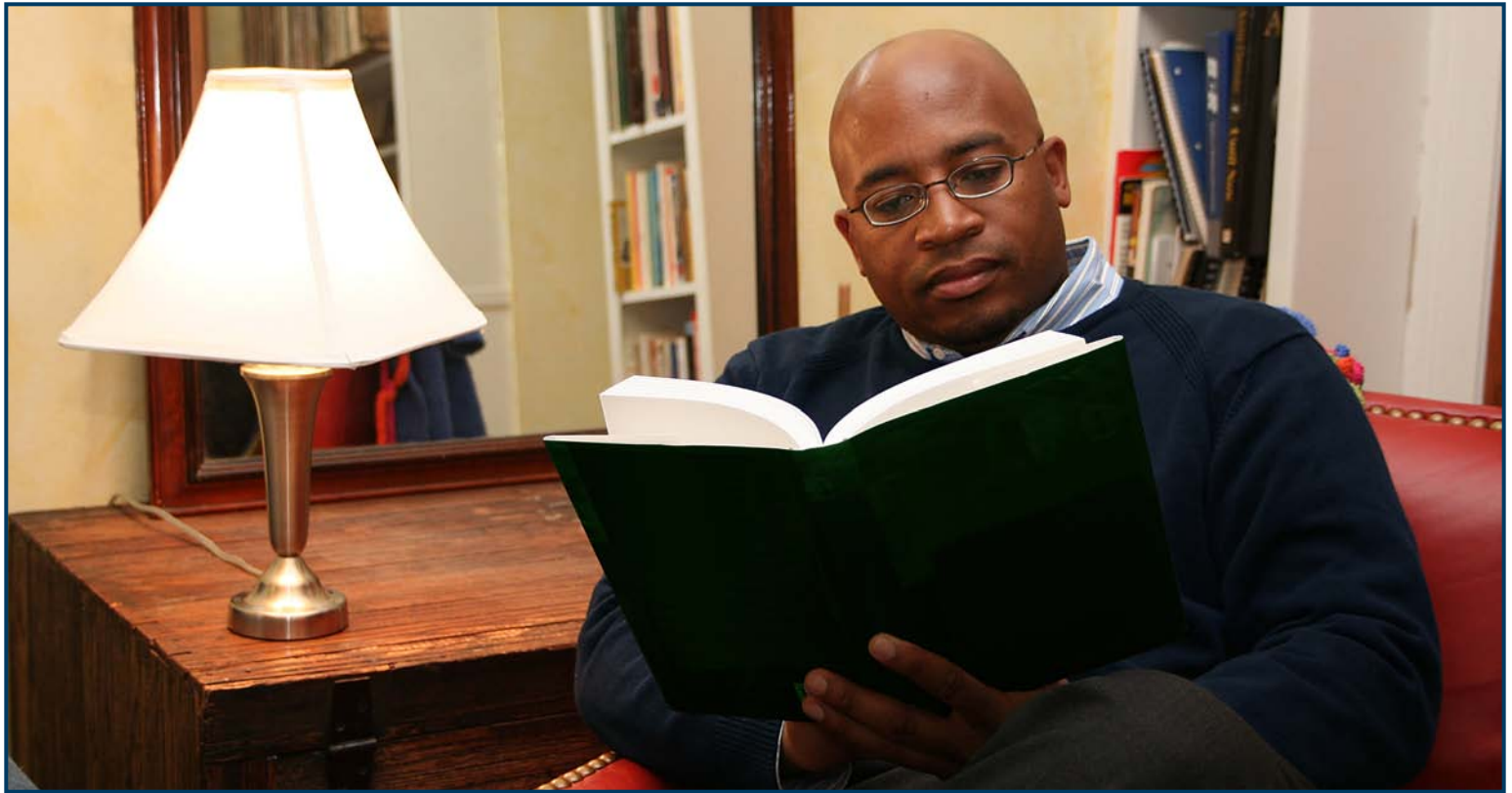
The U.S. Department of Energy is attempting to collect comprehensive market information about ENERGY STAR qualified light bulbs. In the meantime, limited market information is available through research done by energy efficiency program sponsors (EEPS). One notable study, prepared by Itron, Inc. as part of a multi-year program evaluation effort for Southern California Edison, has attempted to estimate market share on a national level. Though the data set does not contain sales information from all types of retailers, the report provides some indication of relative changes in market share since 1999. (See chart below.)

It is important to note that ENERGY STAR qualified light bulbs last about eight times longer than incandescent bulbs and thus lead to reduced sales of incandescent bulbs in future years. As a result, the full impact of past ENERGY STAR qualified light bulb sales will continue to be seen in market share figures for future years.

#### ESTIMATED NATIONAL MARKET SHARE FOR ENERGY EFFICIENT LIGHT BULBS<sup>12</sup>

SOURCE: Itron, Inc.





## REGIONAL ACTIVITIES LEAD TO REGIONAL SPIKES IN MARKET SHARE—SOME SUCCESSES

- During the west coast energy crisis of 2000-2001, high utility prices and threats of blackouts motivated consumers to pay more attention to their energy consumption. Many Californians responded by purchasing energy efficient light bulbs. As a result of this surge in consumer interest, market share in California rose from one percent of unit sales to more than eight percent within six months.<sup>13</sup>
- In the Pacific Northwest, regional sales increased more than eight fold between the end of 2000 and 2001, when program sponsors offered instant rebates and increased promotional activities in response to the west coast energy crisis.<sup>14</sup>
- In 2002, Wisconsin Focus on Energy offered instant rebates in 375 retail outlets throughout the state and offered mail-in rebates statewide. Market share in Wisconsin increased from three percent to eleven percent.<sup>15</sup>
- Beginning in 2002, New England states re-focused their promotional efforts on a buy-down program with manufacturers to reduce prices at the wholesale level. In Massachusetts alone, sales increased from less than 500,000 in 2002 to more than 3 million in 2004.<sup>16</sup>





## ENERGY STAR CRITERIA

The efficiency of light bulbs is measured by efficacy—the comparison of light output to power consumption—and is expressed in lumens per watt (lm/W). To earn the ENERGY STAR, light bulbs must provide at least three times more lumens per watt than standard incandescent bulbs. See the table below for the specific efficacy criteria.

In addition, ENERGY STAR qualified light bulbs must meet a number of other criteria to ensure quality. The criteria include:

- A minimum rated lifetime of at least 6,000 hours (many qualified bulbs exceed this level significantly—products range from 6,000 to 15,000 hours with an average of 8,000 hours)<sup>17</sup>
- A minimum 2-year manufacturer warranty for residential applications and a minimum 1-year warranty for commercial applications
- Start time of less than one second
- Warm-up or “run up” time of less than 3 minutes
- Color rendering index (CRI) of 80 or higher<sup>18</sup>

## COST EFFECTIVENESS

1. Average rated life of all ENERGY STAR qualified light bulbs = 8,000 hours
2. Average lifetime if used 3 hours per day: 7.3 years<sup>19</sup>
3. ENERGY STAR price premium = about \$5.00
4. Time to recover initial investment = less than 1 year
5. ENERGY STAR qualified light bulb price range = \$1.00 to \$20.00<sup>20</sup>
6. Incandescent light bulb price range = \$0.25 to \$5.00<sup>21</sup>

## ENERGY STAR QUALIFIED LIGHT BULB EFFICACY CRITERIA

BULB TYPE	LAMP POWER	MINIMUM EFFICACY REQUIREMENT
Bare Lamp (spiral, triple tube, etc.)	< 15 W	45 lm/W
Bare Lamp	≥ 15 W	60 lm/W
Covered Lamp (A-line, globe, etc.)	<15 W	40 lm/W
Covered Lamp	15 W ≤ Lamp Power < 19 W	48 lm/W
Covered Lamp	19 W ≤ Lamp Power < 25 W	50 lm/W
Covered Lamp	≥ 25 W	55 lm/W
Reflector Lamp (R30, R40, PAR)	< 20 W	33 lm/W
Reflector Lamp	≥ 20 W	40 lm/W



## ENERGY STAR SAVINGS

INCANDESCENT LIGHT BULB	ENERGY STAR QUALIFIED LIGHT BULB	ANNUAL SAVINGS <sup>22</sup>		SAVINGS OVER UNIT LIFE			
				6,000 HOUR	8,000 HOUR*	10,000 HOUR	15,000 HOUR
40 WATT	11 WATT	32 kWh	\$3	\$17	\$23	\$29	\$44
60 WATT	13 WATT	51 kWh	\$5	\$28	\$38	\$47	\$71
75 WATT	20 WATT	60 kWh	\$6	\$33	\$44	\$55	\$83
100 WATT	25 WATT	82 kWh	\$8	\$45	\$60	\$75	\$113

\* ENERGY STAR's preferred assumptions.

	13 WATT ENERGY STAR QUALIFIED LIGHT BULB	60 WATT INCANDESCENT LIGHT BULB
PURCHASE PRICE	\$5.00	\$0.25
LIFETIME	8000 HOURS	1000 HOURS
# OF REPLACEMENTS IN 7 YEARS	0	7
COST OF REPLACEMENT LIGHT BULBS	\$0.00	\$1.75
OPERATION COST (ELECTRICITY COST) <sup>23</sup>	\$10.40	\$48.00
<b>TOTAL COST</b>	<b>\$15.40</b>	<b>\$50.00</b>

<sup>1</sup>U.S. Department of Energy. 2006. *Building Toolbox: Incandescent Lamps*. Retrieved May 19, 2006 from <http://www.eere.energy.gov/buildings/info/components/lighting/lamps/incandescentlamps.html>

<sup>2</sup>An average household consumes 10,660 kWh per year in electricity total, including 2100 kWh for lighting. Cost assumes an average electric rate of \$0.10 per kWh.

<sup>3</sup>Assumes three hours of use per day. The average lifetime of an ENERGY STAR qualified light bulb is 8,000 hours, while the average lifetime of an incandescent light bulb is 1,000 hours.

<sup>4</sup>Assumes the replacement of a 60-watt incandescent bulb with a 13-watt ENERGY STAR qualified bulb, qualified bulb purchase price of \$5.00 and lifetime of 8,000 hours, incandescent purchase price of \$0.25 and lifetime of 1,000 hours, and an electric rate of \$0.10 per kWh.

<sup>5</sup>Based on an average use of three hours per day.

<sup>6</sup>An average ENERGY STAR qualified refrigerator consumes 457 kWh per year.

<sup>7</sup>An average household consumes 2,100 kWh per year for lighting.

<sup>8</sup>An average string of 100 mini incandescent holiday lights consumes 40 watts. Based on five hours of use per day for 30 days.

<sup>9</sup>Based on an average cost of \$2 per cone.

<sup>10</sup>Based on an average cost of \$1.50 for a single 10-inch tapered candle.

<sup>11</sup>Based on a market penetration forecast provided by National Electrical Manufacturers Association and presented by the U.S. Department of Energy at the 2006 ENERGY STAR Lighting Partner Meeting.

<sup>12</sup>Itron, Inc. *California Lamp Trends, 2001-2004*.

<sup>13</sup>Itron, Inc. 2002. *California Lamp Trends, Volume 2*. San Diego: page 1 (Figure 1). Prepared for Southern California Edison.

<sup>14</sup>ECONorthwest. 2002. *Market Progress Evaluation Report: ENERGY STAR Residential Lighting Program, No. 1*. Portland, OR: Report #E02-101, pages 1-2 and 3-6 (Table 6). Prepared for the Northwest Energy Efficiency Alliance.

<sup>15</sup>Itron, Inc. 2004. *California Lamp Trends*. San Diego: page 4 (Figure 7). Prepared for Southern California Edison.

<sup>16</sup>Kates, Brad and Steve Bonanno. 2005. *Energy Efficiency Lighting in the Residential Market*. Las Vegas: presentation to the 2005 ENERGY STAR Lighting Partner Meeting.

<sup>17</sup>Based on product information in D&R International CFL database.

<sup>18</sup>CRI measures how well color appears in the light from the source being measured. An incandescent bulb has a CRI of 100 and is the standard against which other sources are compared. Requiring a CRI of 80 or more ensures ENERGY STAR qualified light bulbs produce pleasant, high-quality light.

<sup>19</sup>Based on a bulb with 8,000 hours of life used 3 hours per day.

<sup>20</sup>Based on data from national retailer Web sites.

<sup>21</sup>Ibid.

<sup>22</sup>Based on bulb use of 3 hours per day and the 2006 national average utility rate of \$0.10 per kWh.

<sup>23</sup>Based on average utility rate of \$0.10 per kWh.





United States  
Department of Energy

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