WATTS a LUMEN?
ENERGY STAR & EISA

Update & Resources

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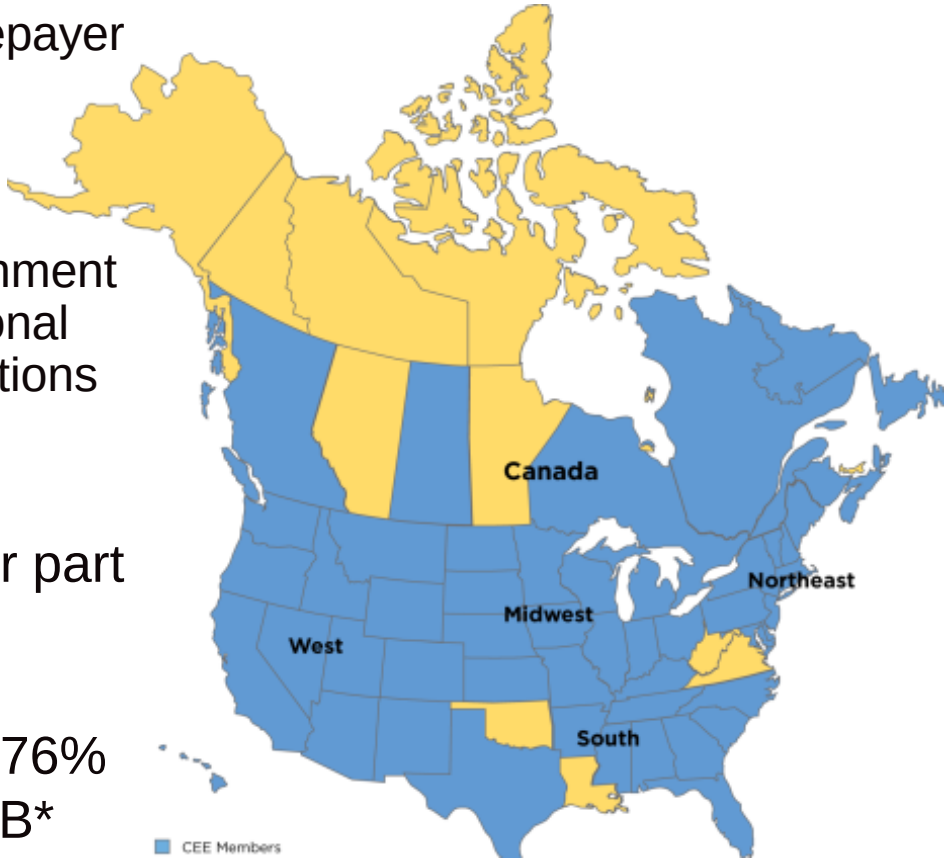
October 22, 2012
Saint Paul, MN

The Consortium for Energy Efficiency (CEE)

- **Efficiency Program Administrators**
  - Utilities and nonutilities with ratepayer funded programs
- **National Program Sponsors**
  - DOE national labs, state and provincial energy offices, government energy research agencies, national and regional efficiency organizations
- CEE brings together over 130 efficiency programs serving all or part of 45 states and 8 provinces
- CEE members manage approx. 76% of total efficiency budgets—$9.5B*



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*Source: Preliminary Results from CEE Annual Industry Report 2012.

Introduction Overview

- Significant Market Changes
  - Higher standards for general service lamps
  - New Federal Trade Commission lamp label
  - ENERGY STAR specification revisions
- Responding Efforts
  - ENERGY STAR Tools & Resources
  - CEE Comprehensive Lighting Working Group
  - Lighting Understanding for a More Efficient Nation (LUMEN) Coalition
  - Individual Manufacturer Messaging

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US Federal Standards

- Energy Independence and Security Act (EISA) of 2007
  - General Service and Modified-Spectrum Lamps

Rated Lumen Ranges	Maximum Rate Wattage	Minimum Rate Lifetime	Effective Date
1490-2600	72	1,000 hours	1/1/2012
1050-1489	53	1,000 hours	1/1/2013
750-1049	43	1,000 hours	1/1/2014
310-749	29	1,000 hours	1/1/2014

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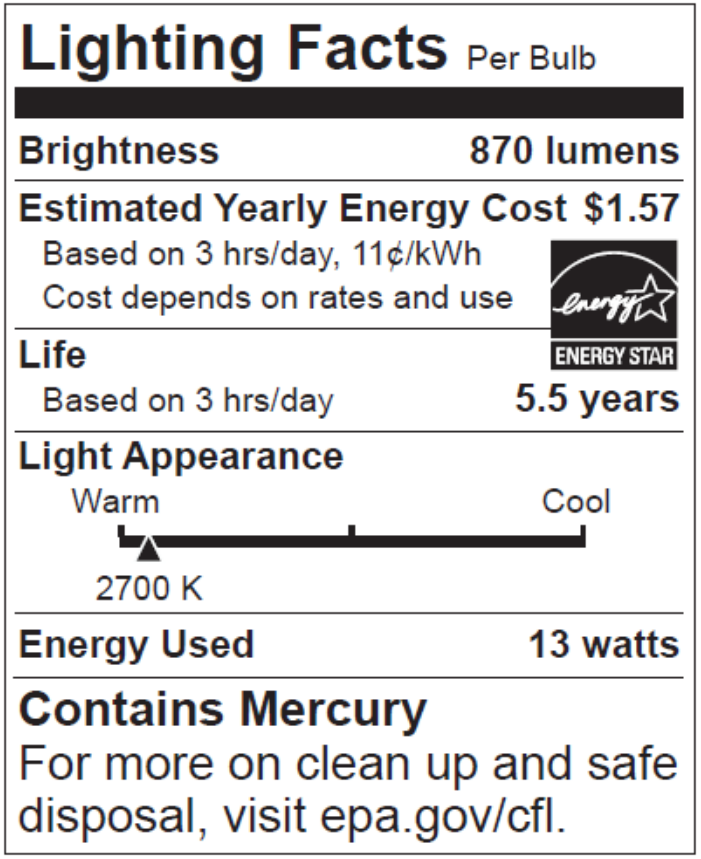
Canadian Federal Standards

- Minimum Energy Performance Standards
  - General Service Lamps: Efficacy ≥ 4.0357 * ln (Lumen output) – 7,1345
    - 1600 Lumens = 22.64 lumens/watt
    - 800 Lumens = 19.84 lumens/watt
  - Modified Spectrum Lamps: Efficacy ≥ 75% of the efficacy of the reference standard spectrum lamps

Lumen Ranges	Effective Wattage of Original Lamps	Effective Date
1050-2600	75 W to 100 W	1/1/2014
250-1049	40 W to 60 W	12/31/2014

New Federal Trade Commission Lamp Label

- Effective January 1, 2012
- The Lighting Facts label provides information about:
  - Brightness (in lumens)
  - Energy cost ($ per year)
  - The bulb's life expectancy
  - Light appearance (if the bulb provides "warm" or "cool" light)
  - Wattage (the amount of energy the bulb uses)
  - Whether the bulb contains mercury

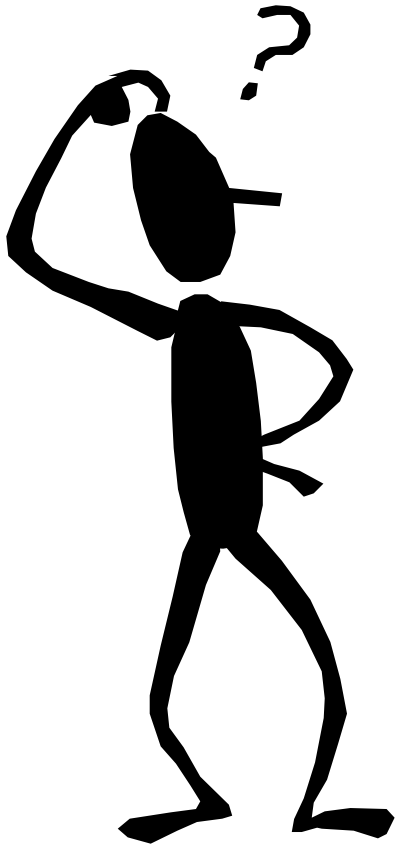


ENERGY STAR Specifications

- Both the lamp and luminaire specifications are technology neutral
- They currently include halogen, fluorescent, and LED products
- Each technology has advantages and disadvantages and is best suited for different applications

Result of These Market Changes

- Consumer confusion and potential dissatisfaction with their lighting purchase
- How can we help alleviate this confusion and enable a positive consumer experience?



ENERGY STAR ABC's

- A = Appearance (color)
- B = Brightness (lumens vs. watts)
- C = Cost

HOW MUCH LIGHT DO I NEED?		
INCANDESCENT BULBS (WATTS)	MINIMUM LIGHT OUTPUT (LUMENS)	COMMON ENERGY STAR QUALIFIED BULBS (WATTS)
25	250	4 to 9
40	450	9 to 13
60	800	13 to 15
75	1,100	18 to 25
100	1,600	23 to 30
125	2,000	22 to 40
150	2,600	40 to 45

See the typical lumens from traditional bulbs so you can find the lumens you need in a more efficient ENERGY STAR model . Remember, to save energy costs, find the bulb with the lumens you need, then choose the ENERGY STAR qualified one with the lowest watts.

How to Choose: The ABCs of Efficient Lighting

Appearance | **Brightness** | Cost

How to Choose – Look for the Lumens (not watts)

About lumens and the lighting facts label: From www.ftc.gov

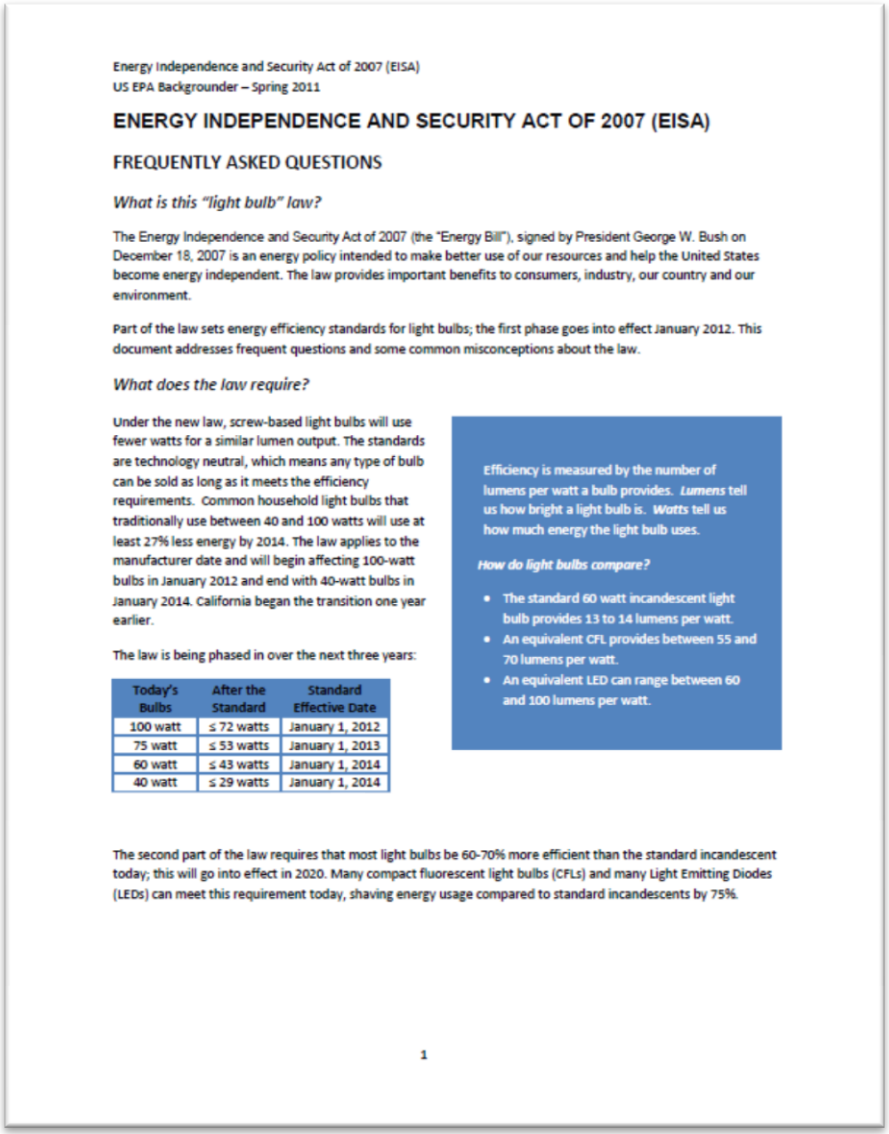
You can find the brightness in lumens right on the front of the package.

- Watts are simply a measure of power – the amount of electricity a bulb needs to operate, while the light output or brightness of the bulb is actually measured in LUMENS.
- As light bulbs get more efficient they use less watts to produce the same amount of light as traditional bulbs. As familiar wattages disappear because of new federal standards their replacements will save money and resources – about $150 a year per household. With this change we need to learn something new – lumens – the measurement of light a bulb puts out. Luckily this information is right on the front of light bulb packaging and will be printed on bulbs by 2012.
- As part of an effort to save energy and reduce United States dependence on foreign energy, Federal legislation is requiring the most common light bulbs (regardless of technology) to produce familiar light levels using less watts. The good news is that light bulb manufacturers support the new standard because it is already possible using today's technology and it fosters innovation!

- Light bulbs of a variety of technologies, including incandescent, compact fluorescent and LED can already meet the new standard.
- Below is a handy reference for those familiar wattage ratings. Learn more about brightness.

ENERGY STAR EISA Background

- Explains the law
  - Purpose
  - Timeline
  - Benefits
- Shows support for the law
  - Manufacturers
  - Innovation



Energy Independence and Security Act of 2007 (EISA)
US EPA Backgrounder – Spring 2011

ENERGY INDEPENDENCE AND SECURITY ACT OF 2007 (EISA)

FREQUENTLY ASKED QUESTIONS

What is this "light bulb" law?

The Energy Independence and Security Act of 2007 (the "Energy Bill"), signed by President George W. Bush on December 18, 2007 is an energy policy intended to make better use of our resources and help the United States become energy independent. The law provides important benefits to consumers, industry, our country and our environment.

Part of the law sets energy efficiency standards for light bulbs; the first phase goes into effect January 2012. This document addresses frequent questions and some common misconceptions about the law.

What does the law require?

Under the new law, screw-based light bulbs will use fewer watts for a similar lumen output. The standards are technology neutral, which means any type of bulb can be sold as long as it meets the efficiency requirements. Common household light bulbs that traditionally use between 40 and 100 watts will use at least 27% less energy by 2014. The law applies to the manufacturer date and will begin affecting 100-watt bulbs in January 2012 and end with 40-watt bulbs in January 2014. California began the transition one year earlier.

The law is being phased in over the next three years:

Today's Bulbs	After the Standard	Standard Effective Date
100 watt	≤ 72 watts	January 1, 2012
75 watt	≤ 53 watts	January 1, 2013
60 watt	≤ 43 watts	January 1, 2014
40 watt	≤ 29 watts	January 1, 2014

Efficiency is measured by the number of lumens per watt a bulb provides. ***Lumens*** tell us how bright a light bulb is. ***Watts*** tell us how much energy the light bulb uses.

How do light bulbs compare?

- The standard 60 watt incandescent light bulb provides 13 to 14 lumens per watt.
- An equivalent CFL provides between 55 and 70 lumens per watt.
- An equivalent LED can range between 60 and 100 lumens per watt.

The second part of the law requires that most light bulbs be 60-70% more efficient than the standard incandescent today; this will go into effect in 2020. Many compact fluorescent light bulbs (CFLs) and many Light Emitting Diodes (LEDs) can meet this requirement today, shaving energy usage compared to standard incandescents by 75%.

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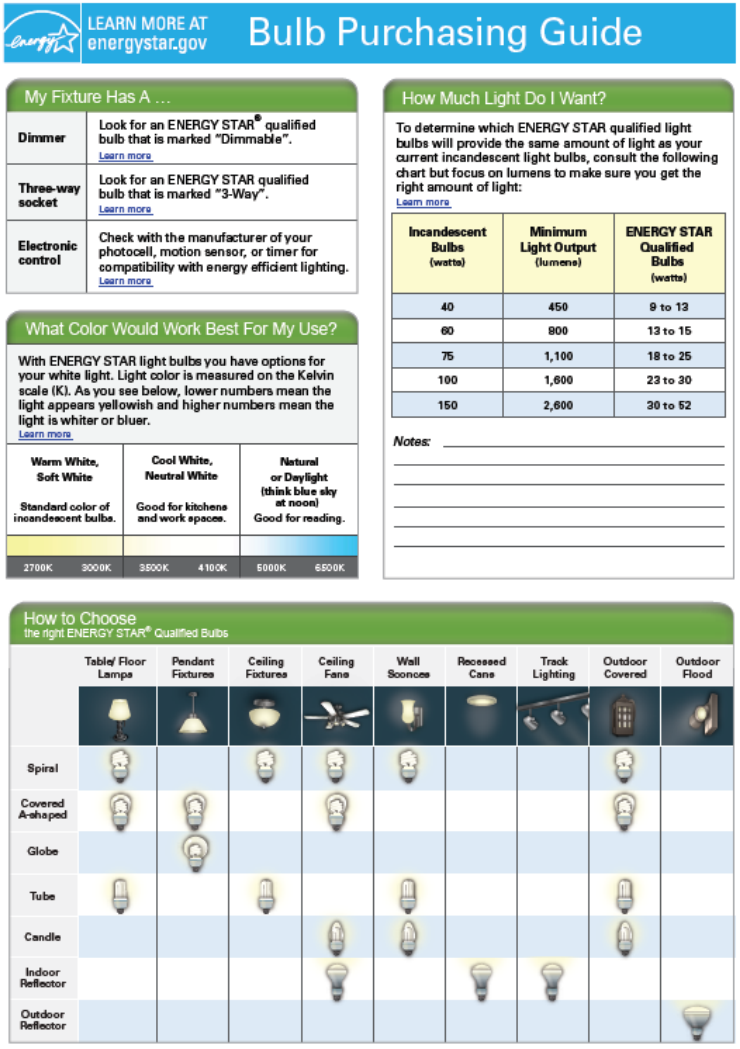
ENERGY STAR Purchasing Check List



LEARN MORE AT energystar.gov

Bulb Purchasing Guide

My Fixture Has A ...

Dimmer	Look for an ENERGY STAR® qualified bulb that is marked "Dimmable". Learn more
Three-way socket	Look for an ENERGY STAR qualified bulb that is marked "3-Way". Learn more
Electronic control	Check with the manufacturer of your photocell, motion sensor, or timer for compatibility with energy efficient lighting. Learn more

What Color Would Work Best For My Use?

With ENERGY STAR light bulbs you have options for your white light. Light color is measured on the Kelvin scale (K). As you see below, lower numbers mean the light appears yellowish and higher numbers mean the light is whiter or bluer. Learn more

Warm White, Soft White		Cool White, Neutral White		Natural or Daylight (think blue sky at noon)
Standard color of incandescent bulbs.		Good for kitchens and work spaces.		Good for reading.
2700K	3000K	3500K	4100K	5000K	6500K

How Much Light Do I Want?

To determine which ENERGY STAR qualified light bulbs will provide the same amount of light as your current incandescent light bulbs, consult the following chart but focus on lumens to make sure you get the right amount of light: Learn more

Incandescent Bulbs (watts)	Minimum Light Output (lumens)	ENERGY STAR Qualified 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

Notes: _____

How to Choose

the right ENERGY STAR® Qualified Bulbs

	Table/ Floor Lamps	Pendant Fixtures	Ceiling Fixtures	Ceiling Fans	Wall Sconces	Recessed Cans	Track Lighting	Outdoor Covered	Outdoor Flood
Spiral	✓		✓	✓	✓			✓	
Covered A-shaped	✓	✓		✓				✓	
Globe		✓							
Tube	✓		✓		✓			✓	
Candle				✓	✓			✓	
Indoor Reflector				✓		✓	✓		
Outdoor Reflector									✓

= ??

- It's not so simple
- Consumers need to know more
  - How much light?
  - What color of light?
  - Dimming?
  - Type of fixture?

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ENERGY STAR Interactive Tool

- Three light color choices
- Dimmability function
- Includes important tips
- Shows where to use CFLs in common fixtures
- It's fun

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CEE's Comprehensive Lighting Working Group

- A Comprehensive Lighting Working Group was formed at CEE's 2009 Industry Partner Meeting
- Participants include:
  - CEE members
  - Government representatives
  - Trade associations
  - Manufacturers
  - Retailers

- Reconvene on a monthly basis, in-person meetings once a year

CEE Messaging Resources

- DRAFT Consumer Talking Points Document
  - Intended to support CEE members and partners in their efforts to develop their own educational / marketing materials and provide increased consistency in the market.
  - Purpose is to answer these types of questions:
    - Why are traditional incandescent light bulbs being “phased out”?
    - What are my options when purchasing a light bulb?
    - How do I choose the right light bulb?
    - What is the best light bulb for my application?
    - Is mercury used in light bulbs?

CEE Messaging Resources

- Summary of Educational/Marketing Resources
  - CEE compiled all the other resources we are aware of on this topic for folks to learn from:
    - LUMEN Coalition
    - Natural Resources Defense Council
    - Government Agencies (EPA, DOE, FTC)
    - Manufacturers
    - Retailers

CEE Resource Availability

- These resources are not publicly available since they aren't consumer facing
- Can join CEE's Comprehensive Lighting Working Group to work on these documents:

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Examples of CEE Member Messaging

Fixture Compatibility for CFLs

There are many different types of CFLs available to suit the most common household fixtures. Review the chart below for CFL compatibility guidelines.

Fixture Compatibility Chart

Fixture Type	CFL Compatibility
Standard screw-in fixtures	Most existing standard incandescent fixtures accept screw-based CFLs.
Fixtures with dimmers	Only certain ENERGY STAR® qualified screw-in CFLs are compatible and available. Dimmable CFLs are constantly being improved and introduced. Check packaging to ensure the CFL is dimmer compatible. Using a CFL that is not designed for dimmers can shorten its life significantly and create problems such as flickering or noise.
CFL-specific fixtures	All ENERGY STAR® qualified fixtures require pin-based CFLs.
CFL lamps	Always read product packaging for specific performance and compatibility requirements.
Occupancy sensors	Always read product packaging for specific compatibility with CFLs.
Thermal considerations	Using screw-in CFLs in a fixture designed for incandescent bulbs may not reduce the heat adequately and can affect the CFLs light output and shorten its lifespan.

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How to choose the right ENERGY STAR® qualified light bulb

AVOID EARLY BURNOUT:

Many sizes and styles

CFLs come in a variety of shapes and sizes to fit almost every need. Today, you can find CFLs for dimmer switches, three-way lamps, recessed cans and outdoor applications.

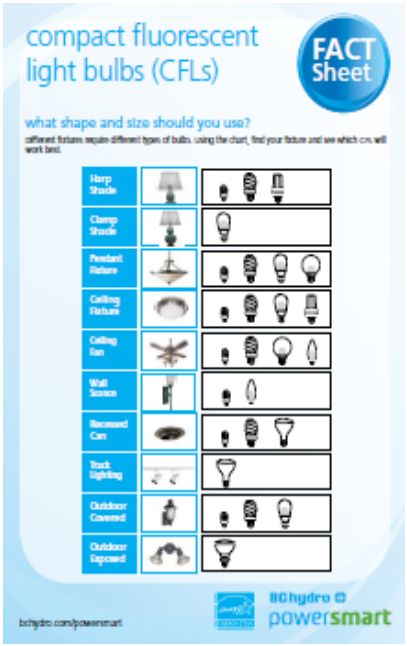
Different fixtures require different types of bulbs. Use the chart above to find your fixture and determine which bulb will work best.

Color temperature

Different bulbs emit different colors of light, from warm tones to cool. This is known as color temperature, and is measured in degrees Kelvin (K). In general, the lower the Kelvin temperature, the warmer (more yellow) the light; the higher the Kelvin temperature, the cooler (blue) the light. ENERGY STAR qualified bulbs offer a range of color-temperature choices:

Warm (2700°K to 3000°K): Warm color temperatures are preferred by people who like the color of light from incandescent bulbs. Lighting with warm color temperatures creates a welcoming atmosphere in living rooms, dining rooms and bedrooms. Choose a bulb that states "warm white" or "soft white" on the package.

Cool (4100°K and up): Cooler color temperatures are sometimes preferred for clean, clear light in kitchens and in bathrooms. Choose a bulb that states "cool white" or "daylight" on the package.



compact fluorescent light bulbs (CFLs)

FACT Sheet

what shape and size should you use?

Lamp Shade
Clamp Shade
Pendant Fixture
Ceiling Fixture
Ceiling Fan
Wall Sconce
Recessed Can
Track Lighting
Outdoor Covered
Outdoor Exposed

bchydro.com/powersmart

BCHydro powersmart

BC Hydro

compact fluorescent light bulbs

savings and convenience

where to install

read the manufacturer's label

CFL recycling

bchydro.com/powersmart

BCHydro powersmart

Wisconsin Focus on Energy

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Panelists to Discuss Other Efforts

- LUMEN Coalition
  - Monique O'Grady, Alliance to Save Energy
- Annual Socket Survey and a Manufacturer Perspective
  - Jennifer Dolin, OSRAM SYLVANIA