Residential Lighting: How to Determine the Most Energy Efficient Technology for Your Needs

OSU Green Home Workshop 5-16-17

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Who has bought an efficient bulb they hated?

Incandescent  Halogen  CFL  LED  Fluorescent
Who likes choosing an efficient light bulb?

- Incandescent
- Halogen
- CFL
- LED
- Fluorescent
Who likes changing light bulbs?
Who thinks bulbs burn out at convenient times?
Who likes getting on a ladder to change bulbs?

Incandescent  Halogen  CFL  LED  Flourescent
Efficiency Last.
Good light and long life are first.

Incandescent  Halogen  CFL  LED  Fluorescent
Let’s Talk Turkey

Total Lifetime Cost for 25,000 hours in dollars

<table>
<thead>
<tr>
<th></th>
<th>Incandescent</th>
<th>CFL</th>
<th>LED</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0</td>
<td>45</td>
<td>90</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>180</td>
<td>225</td>
<td>270</td>
</tr>
<tr>
<td></td>
<td>315</td>
<td>360</td>
<td></td>
</tr>
</tbody>
</table>
Let’s Talk Turkey

LEDs win.
Let’s Talk Turkey

The cost spectrums don’t even cross!

LEDs win again.
Conclusion:
It’s actually kind of dumb to keep using incandescents.

Math behind the 25,000 hour charts

<table>
<thead>
<tr>
<th></th>
<th>Watts</th>
<th>Bulb Cost</th>
<th>Bulbs Needed</th>
<th>Total Bulb Cost</th>
<th>KWh</th>
<th>KWh Cost</th>
<th>TOTAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incandescent</td>
<td>60</td>
<td>$1-5</td>
<td>25</td>
<td>$25-125</td>
<td>1075</td>
<td>$86-215</td>
<td>$111-340</td>
</tr>
<tr>
<td>CFL</td>
<td>13</td>
<td>$2-10</td>
<td>2.5</td>
<td>$5-25</td>
<td>325</td>
<td>$26-65</td>
<td>$31-83</td>
</tr>
<tr>
<td>LED</td>
<td>7</td>
<td>$3-20</td>
<td>1</td>
<td>$3-20</td>
<td>175</td>
<td>$14-35</td>
<td>$17-55</td>
</tr>
</tbody>
</table>

LEDs win.
LEDs are **still** getting cheaper.

$0.66/bulb on clearance
Objection:
You can’t get LEDs for weird fixtures.

Track lighting

Halogen fixtures
You *can* get them for weird fixtures.

Track lighting
You *can* get them for weird fixtures.

Halogen fixtures
Understanding Efficient Bulbs
How Bright?

Lumens and Brightness

You don’t need to know this.
(Most boxes tell you what they are equivalent to.)
Efficiency

LED bulbs consistently win this one.
How long do they last?

Bulb Life in 1,000s of hours

- Incandescent
- Halogen
- Fluorescent
- CFL
- LED

- 0
- 1
- 2
- 3
- 10
- 15
- 50
How long do they last?

LEDs win again.
Failure = 70% brightness
Two Numbers: Buying a Bulb You Actually Like

2700K

90+ CRI
2700K

Color Temperature
in degrees Kelvin

- 2200: Candle
- 2700: Incandescent
- 5000: Work Light
- 6500: Outdoors
2700K

Color Temperature
in degrees Kelvin

- 2200: Candle
- 2700: Incandescent
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90+ CRI

Color Rendering Index
Percentage

0 0-79 Not Pretty 80 Pretty Good 90 Very Good 100

Poor CRI = Sickly Skin Tones
90+ CRI

No CRI on the package? It’s probably lousy.
Really Nice Label
Two Numbers

2700K

90+ CRI

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