

Reduce Your Carbon Footprint (and save money) with LED lights

In a world where the disastrous effects of climate change are being increasingly showcased and the urgent need for action has become apparent, have you ever wondered how you and your family can help to reduce global carbon emissions from your own home? By switching your lighting to LEDs you can help the environment (and your wallet) in a way that has a surprisingly large impact.

This article was written by GaTech students as part of the Carbon Reduction Challenge. See the end of the article for information on how you can get involved.



Reasons to switch to LED lighting

- **Energy efficiency:**

Incandescent bulbs release up to 90% of their energy as heat. The electricity you pay for to light up your house may be going towards heating it instead, something none of us want in hot Georgia summers! Because LEDs release less heat, they use up to 85% less energy than an incandescent bulb of the same brightness. This means that if you replaced just ten 60W incandescent bulbs with LEDs of the same brightness, you would **save around \$110 a year** on electricity¹.

- **Carbon savings:**

In Georgia, 64% of our electricity production comes from coal and natural gas, both of which release carbon dioxide into the atmosphere when they are burned (GaPower). Until our electricity production shifts to renewable energy, the best way to reduce our dependence on carbon emissions is through energy efficiency. Simply put, if we use less electricity, we use less fossil fuel! Because LEDs are so much more efficient than incandescent bulbs, switching just ten 60W lights in your house to LED bulbs saves around **1000 lbs of CO2 each year**².

- **Long lifetime:**

Not only are LEDs more energy efficient, but they also last longer than incandescent bulbs. An LED bulb has a lifespan of around 25,000 hours, 25 times longer than incandescent bulbs! (energy.gov) This translates to around a **11.5-year lifespan**³. In this time, you would have to replace an incandescent bulb 24 times, adding up to around \$50. This is about 20 times the price of one LED bulb!

How to switch to LEDs

You might have noticed that the wattage of LED bulbs is much lower than incandescent bulbs. Wattage is based on how much energy a bulb uses, not how bright it is. If you're looking to replace your lighting with LEDs of the same brightness, look for the lumen number on the packaging instead of the wattage. This useful chart from Viribright lists the incandescent, CFL, and LED wattage equivalents for common lumen numbers:

Lumens	Incandescent Watts	CFL Watts	LED Watts
400-500	40	8-12	6-7
650-850	60	13-18	7-10
1000-1400	75	18-22	12-13
1450-1700	100	23-30	14-20
2700	150	30-55	25-28

Harsh Light?

When you think of LED lighting, you might think of the harsh white light of an office building. As these lights have become more popular in households, both warmer colors and dimmable brightness have become widely available.



What about CFLs?

While CFL bulbs are more efficient than incandescent, LEDs are still about two times more efficient than CFLs. Replacing ten 14W CFLs with LEDs of the same brightness saves you around \$17 a year on electricity⁴ and saves around 150 lbs of CO₂ each year⁵. CFLs also have a shorter lifespan than LEDs at around 8000 hours as opposed to 25,000⁶. This makes the replacement costs about twice as much as LEDs. In the long term, these money and carbon savings are certainly worth it!

Join the Carbon Reduction Challenge!

This article was written by GaTech students as part of the Carbon Reduction Challenge. Our group of five students, guided by Dr Kim Cobb, have set a goal of reducing Georgia's carbon emissions by 10,000 lbs CO₂.

If you are interested in making the carbon reducing changes described in this article, please sign up for our email list and/or take a survey on your actions. This will support our project by allowing us to track its impact on carbon emissions. Scan the QR code below or visit <https://tinyurl.com/CRC-Survey-LED> to sign up!



To learn more about our project, follow us on social media:

<https://www.instagram.com/crcptc/>

<https://www.facebook.com/crcptc/>

For more information on past Carbon Reduction Challenges:

<https://globalchange.gatech.edu/news/carbon-reduction-challenge-winners-implement-climate-solutions-at-georgia-tech/>

Sources:

<https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/led-lighting>
[https://www.energy.gov/articles/top-8-things-you-didn't-know-about-leds](https://www.energy.gov/articles/top-8-things-you-didn-t-know-about-leds)
<https://www.georgiapower.com/>
<https://www.viribright.com/lumen-output-comparing-led-vs-cfl-vs-incandescent-wattage/>
<https://www.led-lights.com/>

Footnotes:

- 1: assuming a cost of \$0.11 per kWh, 6 hours of use per day, and 60W incandescent = 7W LED
- 2: assuming 1kWh produces 1 lb CO2 in Georgia, 6 hours of use per day, and 60W incandescent = 7W LED
- 3: assuming 6 hours of use per day
- 4: assuming a cost of \$0.11 per kWh, 6 hours of use per day, and 14W incandescent = 7W LED
- 5: assuming 1kWh produces 1 lb CO2 in Georgia, 6 hours of use per day, and 14W incandescent = 7W LED
- 6: assuming 6 hours of use per day