



LED-ing the Way to a Brighter Future

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State the Problem, phenomena, or driving question

What is a simple (yet effective) change my household can make in order to reduce our carbon footprint?

Impact Statement

If I change all of the lights in my house to LED bulbs, then my house will be saving around 25% more energy. If I encourage my friends and neighbors to do the same, our houses will not only be more efficient, but will contribute to reaching the goals set in the Bellevue Environmental Stewardship Plan. Despite the larger initial investment, LED bulbs last for longer, use less energy, and can pay for themselves in 9 months, making them a simple and impactful change in any household. If I convince my school or school district to make this change, Bellevue will be quite simply changed for the better.

Provide brief background knowledge

1. Traditional incandescent bulbs release 90% of their energy as heat (NOT LIGHT)
2. Halogen incandescent lights, compact fluorescent lights (CFL's), and light-emitting diodes (LED's) initially cost more than the traditional lights, but during their lifetime they use less energy
3. They can be pushed even greener with dimmer settings, timers, and other innovations
4. Halogen incandescent lights meet the federal minimum energy efficiency standard, but there are many, many other options
5. CFL's use less electricity than traditional bulbs, and if money is a concern - they can pay for themselves in 9 months
 - a. $\frac{1}{4}$ the energy of a traditional bulb
 - b. $\frac{1}{3}$ of halogen incandescent
 - c. Lasts 10 times as long as a traditional bulb
 - d. RECYCLE ALWAYS (toxic waste... mercury)
2. LED lights
 - a. They use 20-25% of the energy of traditional bulbs
 - b. They last 15-25 times longer than traditional bulbs
 - c. Use 25-30% of the energy of halogen incandescent
 - d. Last 8-25 times longer than halogen incandescent

Show how the project supports community goals (local policies, plans or performance measures)



1. My family wants to decrease our electricity bill + be environmentally conscious
2. The City of Bellevue carbon reduction efforts are not on track to meet the goals that were set in 2012. See the Environmental Stewardship Plan
3. King County wants to increase the energy efficiency by 2050
 - i. (They're giving out LED kits to low income families)

Document current conditions

Almost all lights in our house are incandescent. I will count the number of lights and estimate their usage to estimate cost and efficiency

Identify your stakeholders

1. My PARENTS !
2. My extended family (to extend the project further)
3. My friends (see b)
4. City of Bellevue
5. Bellevue YouthLink
6. Puget Sound Energy - Energy Conservation program

Describe the project and the steps taken to implement

1. Document current conditions
2. Introduce the idea/goal of changing our household lights to LED
3. Once approval has been received, buy the LEDs!
4. Slowly change lights to LED as the old ones burn/die out
5. Monitor conditions after (but now with the energy efficiency of LED bulbs)
6. Live long and prosper

Describe the audience (stakeholders) you will present your work to

1. My parents
2. My peers
3. My school (I'm not sure what they use as light fixtures)
4. City of Bellevue
5. Bellevue YouthLink

Explain the impact your project had with evidence

1. Calculate the initial energy efficiency and cost
2. Calculate the final energy efficiency and cost
3. Factor in the cost to replace the bulbs with LED
4. Create a timeline showing when the LEDs earn their keep
5. (Yet to be done)



Reflect on your experience

This experience was pretty fulfilling. I was able to make a small change in my household that will LE(a)D to future small changes. I wasn't thinking about all of the calculations when I was in the middle of this experiment, but as a Sustainability Ambassador I will be sure to go through and document the changes to provide evidence for my work and for the difference my family is making. This impact project could be implemented literally anywhere, from a school to a workplace or, just as easily, another home. I'm glad I did it.

<https://www.scientificamerican.com/article/led-lightbulb-concerns/>

<https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money#:~:text=The%20most%20popular%20light%20bulbs,because%20they%20use%20less%20energy.>