

CFL Bulbs: Good or Bad for the Environment?

Q: I've heard that CFL bulbs contain mercury and that mercury is dangerous. So how can CFL bulbs be "good" for the environment?

A: This is a case of taking something that should be a positive and trying to make it into a negative. I'm not sure why all of this mis-information is directed at CFL bulbs, but here is my take on it.



First of all, CFL bulbs use about 1/4th of the electricity of a normal bulb, and they last much longer (I have seen claims of 10x longer, but my personal experience has been more like 5, but that's a detail).

That is a factor of 20-40x less electricity used over the life of the bulb. There are not many places where such an outstanding improvement in efficiency can be obtained so easily. Since most of our electricity comes from burning coal, reducing electricity usage reduces the amount of coal that needs to be burned.

Secondly, it is absolutely true that CFL bulbs contain mercury, a tiny amount primarily in vapor form. It is what makes the bulb give off light--electricity is run through the vapor, which excites the mercury gas to glow. A coating on the inside of the glass determines the color of the light that you see. The amount of mercury involved in a typical CFL bulb is 5

milligrams, which means it would take *200 bulbs worth to even amount to 1 gram of mercury*. (That's the same as saying almost 91,000 bulbs to use 1 pound of mercury!)

What the fear mongers do not mention is, there is nothing "magic" about CFL bulbs in this regard. *This is exactly how regular fluorescent light tubes work as well!* People have been using them (and breaking them, and throwing them in the landfill) for DECADES now, and no one has been screaming about it or sending in the hazmat crews!

This is not to say that releasing mercury willy-nilly into the environment is a good thing. It most certainly is not. All these decades we should have been pushing for proper disposal of regular fluorescent bulbs, and we should be certainly pushing for the same thing for properly handling CFL bulb disposal as well.

We as a society have become much more sensitive to issues like the toxicity of mercury, and statements by the EPA and other officials are certainly more strident than they were 30 years ago. But (and I'm going to insert a personal opinion here), seeing hazmat teams respond and decontaminate a school when a mercury thermometer is broken (or a CFL bulb!) is a complete over-reaction. The tiny amount of mercury involved is simply not that dangerous.

If one is concerned about mercury in the environment, one must dig a little deeper to understand the truth. For one of my public talks, I went through an exercise to put this in perspective. For my example, 2007 is the year I looked up the numbers, and here is what I found:

In 2007, there were some 300 million CFL bulbs sold. Let's assume there is 5 mg of mercury in each bulb, for a total amount of mercury (converting to pounds and then to tons) of 1.6 tons of mercury. That's a lot of mercury, no doubt about it. Now let's make what is actually a worst-case assumption, that ALL of these bulbs only last 5 years, and ALL of them simply get thrown in the landfill. Then this is **0.32 tons** of mercury per year on average (less if the bulbs last more like 10 years, as claimed), but at least it is going into a (hopefully) controlled environment, that is, a landfill.

It turns out that burning coal for electricity also releases mercury (and many other toxic substances), and coal burning releases it into the free atmosphere, where it lands---**anywhere**. That's right, on farm land, in the bay, on your house and yard, wherever. And how much is released? In 2007, **50 tons of mercury** was released by coal burning power plants in the US alone, let alone all of the other bad stuff that was released at the same time. That's 150x more mercury per year from coal burning! By reducing the need for electricity, CFL bulbs more than offset their mercury pollution even if they are thrown away! Of course, if we can get people to recycle them and/or dispose of the bulbs properly, the improvement is only magnified.

This is a good example of the kind of homework one needs to do to put issues like this in the proper light (so to speak). I hope this example is useful.

-- Dr. Bill Blair

Last updated: October 2011.