

Lightbulbs: The more efficient they get, the more light we use

September 14 2010, By Sandy Bauers

This is a cautionary tale about a few porch lights. Once upon a time, porch lights had incandescent bulbs. Eventually, many residents subbed them out with those swirly compact fluorescent bulbs, which use a quarter of the energy.

The funny thing -- and yes, they laughed about this -- was that once they made the switch, some residents were so delighted with the [energy savings](#) that they dispensed with the hassle of turning the lights off at dawn, then back on at dusk.

They left the porch lights lit round the clock.

This is one of the beautiful things about technological advances: They often make life simpler and easier.

But the obvious rub is that electric usage didn't decline as much as it could have.

That may well be the case going forward, even as the use of [light-emitting diodes](#), or LEDs, which use even less energy than CFLs, becomes more widespread.

LED researchers from the Sandia National Laboratories in Albuquerque, N.M., have studied historical patterns of lighting use, and they have reached some disquieting conclusions.

Consistently over the last 300 years, as humans have progressed from candles to oil lamps to gas lamps to electricity, we've responded by simply opting for more [light](#).

Even if it got cheaper, even if it was more efficient, we never said, "Let's conserve." We just used more.

The researchers looked at potential contributing factors and found an interesting correlation with overall wealth, expressed as per capita [gross domestic product](#), or GDP. It turns out, fairly consistently, humans have spent 0.72 percent of GDP on lighting. Their findings were published last month in the [Journal of Physics D](#).

As wealth and the GDP have risen, so has light use.

What they don't know is whether the past will predict the future, says lead researcher Jeff Tsao.

As the technology gets more efficient, will we simply bathe ourselves in more light?

Consider the example of TVs. Companies keep making more efficient ones, and we just get bigger ones. Then we add TiVo. Set-top boxes are one of a household's major energy-guzzling electronic devices.

We make refrigerators more efficient, and then add water dispensers and automatic ice makers.

Maybe we're just a greedy species.

So perhaps the advent of LEDs will mean that city streets and other public places that are dim or dark now will be flooded with light.

Maybe we'll decide our highways need to be better lit, too.

This isn't all bad, of course. In the past, more lighting has led to increased productivity and a better quality of life. Certainly, this would be welcome in developing nations, which might also see a rise in literacy if children didn't have to study by oil [lamps](#).

Another upside is that public safety might improve, as well as an overall sense of community. Think Times Square, only brighter.

Tsao also points out that with an aging world population that has declining eyesight, we might need more light to compensate.

We may find amazing new uses for light, says coauthor Mike Coltrin, another Sandia LED researcher.

One concern, other than energy use, is light pollution, which can blind drivers and astronomers alike. But the researchers point out that LED lighting can be more finely tuned and focused.

Fortunately, dimming technologies also are improving, which might blunt the energy-sucking effects of more lighting. Some parking garages, for instance, are lit, but at a low level. Motion detectors sense when a person walks through, and they make that section brighter.

Tsao says no one really knows how much light is enough.

Regulations might have an effect. In the U.S., an energy bill passed by Congress in 2007 will phase out the incandescent bulb by 2014.

Since I'm greedy, too, my hope is that we can do both: Have a brighter, better world, and still use less electricity.

After all, as in the case of the porch lights -- where the efficiency of fluorescents more than made up for the doubled usage -- that's precisely what happened.

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