

The refrigerator

Eric Blair

20 September 2006

Your refrigerator works just like an air conditioner, except it is running all the time, year 'round. So it's worth getting one that isn't too very consumptive. And you know what that means—math!

In October '04, when I first moved in but wasn't all here, my house was consuming 3.2 kWh per day. That gives me an upper limit on how much my fridge is consuming every day. If you don't have a reference point like that, the EPA makes it e-z for you to measure the cost of your fridge by model number.

The usual shopping site lists a decent fridge (freezer in a sensible location, water dispenser to minimize extraneous door opening, stainless steel cover, which, as you will recall from a previous episode, adds \$5,000 to the value of a house) at \$1275 minimum. Down at the bottom of the page, the fridge self-reports that it consumes 494 kWh per year, which is 1.35 kWh per day. [A kWh is a kiloWatt hour. A Watt is a measure of how much power your appliance is consuming in an instant, and a kiloWatt is a thousand of those. If you let a 1kW appliance run for an hour, it has used 1kWh. For example, a 100 Watt bulb, run for ten hours, would use 1kWh.]

Through the magic of subtraction, that means that buying a new refrigerator will save me at most $3.2 - 1.35 = 1.85$ kWh per day, or 675 kWh per year.

Adding up all the haphazard service fees, I'm paying 14.4 cents per kWh, which is up from 6.94 two months ago, due to the debacle that is Maryland's electricity supply.

Multiplying out, that's a savings of at most \$97/year, which means that buying the new refrigerator doesn't make sense cash-wise.

But what about environment-wise? BGE's energy sourcing page tells me this about how much waste my usage spews into the world:

Emission Type	Lbs. per MWh
Nitrogen Oxides (NOx)	2.59 100.0 %
Sulfur Dioxide (SO2)	8.49 100.0 %
Carbon Dioxide (CO2)	1292.03 100.0 %

That max. savings of 675 kWh = 0.675MWh means that keeping an older fridge means 872 pounds (395kg) of extra CO₂ in the world.

Now that I've calculated that number, I'm not sure what to make of it. Should my environmental conscience be shocked? Wikipedia, citing a now-defunct link to the USDA, tells me that the average person exhales 0.9kg of CO₂ per day, or 328.5kg per year. Thus, my upper limit for the savings on a

new fridge is that it would be equivalent to one fewer adult floating around, breathing. But, again, is this an actionable savings?

Bonus appliance Thermodynamics is easy: energy in=heat spewed out. After all, when we talk about an appliance being inefficient, we say something like ‘all the energy is getting lost in heat,’ so if the appliance’s purpose is to heat up, it doesn’t have many ways left to be inefficient. But if the intent of the appliance is to heat up your water, and the heat is drifting out into the room at large, it isn’t quite doing its job. In the winter, you won’t mind, but in the typical age-of-global-warming summer, the extra energy is more than a loss.

So I recently picked up a nice, electric teakettle and have nothing but praise for it.

I suppose the USA just doesn’t have the culture of tea that the rest of the world has. The typical convenience store in Taiwan (and I’m told the rest of Asia) includes a huge array of add-hot-water options, like tea, coffee, ramen, soup, et cetera, plus cups and a big hot water dispenser. There’s iced tea in the refrigerated section if it’s too warm for the hot stuff. 7-Eleven is getting there, with a decent ramen rack and coffee, but still has a ways to go in the sheer variety of things one can do with hot water. But there is just oh-so-much that hot water does for us.

To put it simply, the electric kettle brings me joy and efficient warmth. The kitchen doesn’t warm up from lost heat in the least, the way it would if I were running the stove. It warms up faster as a result. There’s a water gauge on the side, and I know my favorite mug takes two cups and pasta needs five, so I don’t boil excess and then pour heat down the sink. Since it turns itself off when the water boils, there’s no energy loss as it hits me that the water’s boiling and I walk back from the other side of the house to the stove, and therefore my time spent at the other side of the house is not nearly as stressful. If I put on water for pasta, and then forget for half an hour, that’s OK, since the insulation is decent and it all comes right back to boiling in about ten seconds. Of course, the seven minutes of pasta-boiling is as normal. Maybe I’ll switch to capellini, which cooks in three.