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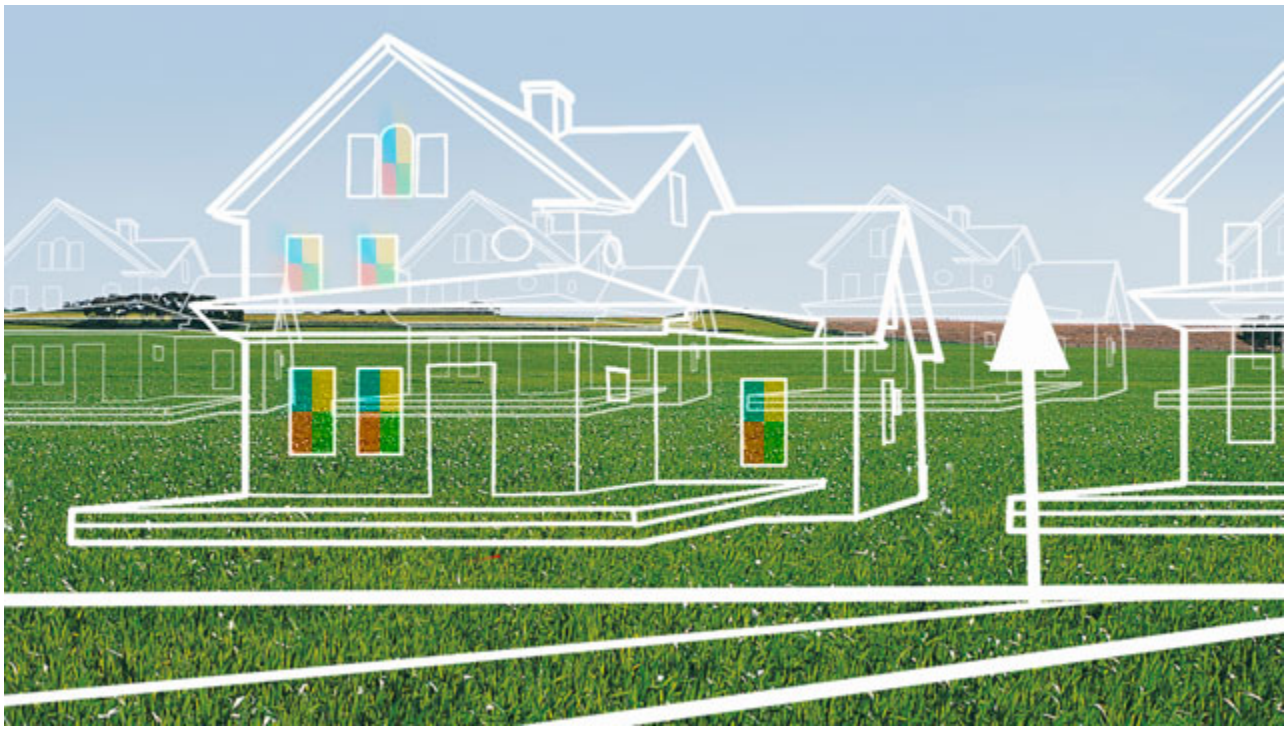
Review: Microsoft Hohm and a whole-house power monitor

By Nate Anderson



Microsoft's Hohm energy efficiency and tracking service, still in beta, has a unique sense of style. Who expects a discussion about insulation R-values to involve pirate jokes?

"What do pirates look for in attic insulation?" Hohm asks. "The arrrr value! Insulation R-value measures how well a material stops heat flow, the higher the better."

This can be a bit jarring at first—are the sorts of people who write about "arrrr value!" really the ones you go to for home improvement questions?—but if you're going to use Hohm, you'd better get used to it.

"Read and follow the instructions that came with your new refrigerator. (This will not harm your street cred)," says a tip on buying more efficient iceboxes. You'll also want to keep the new fridge away "from anything hot like an oven, direct sunlight, or visiting supermodels."

When it comes to lighting your room, consider task lighting; it can save money because, the site informs us, "you won't need to turn on the overhead light for your ironic cross-stitch." Advice from Bob Vila this is not.

Supermodels! Pirates! Ironic cross-stich! Is Hohm staffed by twenty-something males? (Videos on the site suggest that yes, it is.)

But beneath the tone, Hohm is a serious and interesting service. On its own, it looks a lot like other sites offering energy efficiency tips, but its real power comes from its ability to tap into your actual home energy use. The "smart grid" might not be a reality for most of us yet, but a clever combination of sensors, WiFi, and Web data provides unique feedback on your energy use. We tested the Hohm service with one of these devices, the ingenious PowerCost Monitor from Canada's Blue Line Innovations, to find out just how much you can learn from watching your home's energy use in real-time—and if that knowledge is worth the cost.

I want feedback

For his birthday last year, a friend of mine received a tiny display unit that hooked into his SUV and showed his mileage per gallon in real-time. The device was inexpensive, but the effect was remarkable. Within weeks, my friend was coasting down hills and accelerating slowly from a stop—anything to keep his numbers up. He had even invented a number of his own "techniques," some of rather dubious scientific validity, all in an attempt to "win" the game he was now locked into with the tiny LCD display stuck to his dashboard.

After installing the PowerCost Monitor, I knew how he felt. The monitor is a gadget that attaches to your home's electric meter, reads the whole-house electricity use rate in real-time, and beams it to an indoor display unit that shows how many kilowatts are being consumed along with the estimated price of that consumption.

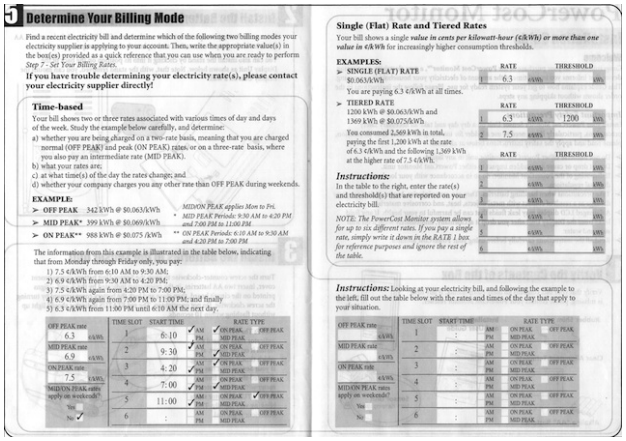
I called it "ingenious" above because the device has the daunting job of conforming to a huge array of electricity meters: everything from electromechanical meters with dials and a spinning disk to electronic meters with an infrared data ports on the top or edge or center. Meters may use different "power factors," and costs may differ based on region of the country, time of day, or season of the year.

Handling all these variables might seem like a challenge, and I was initially skeptical that this would work at all. My own electric meter is an electromechanical unit old enough to have a clouded plastic housing over the top. The PowerCost sensor unit, which is made of plastic, clamps to the outside of this housing and a thin adjustable arm extends over the face of the unit; this contraption must be perfectly aligned with the spinning metal disk inside the meter, and it reads the disk speed by noting how quickly a black mark on the disk's edge spins past the sensor's eye. What could possibly go wrong?


The sensor unit embracing my power meter

Yet, improbably, the sensor appears to work. Installation wasn't difficult, but when you see warnings like "it could take an hour or more of your time to set up the device," you know that this isn't for the faint of heart. While grandma might enjoy the system once installed, dealing with batteries, sensor alignment, device syncing, and rate-setting makes the process non-trivial; and if you need to configure the separate WiFi unit that pumps all of this real-time data out to the Internet, things get even trickier.

Even the interior wireless display unit requires a healthy helping of setup. If filling in the electricity rate chart below gives you the heebie-jeebies, this may not be the unit for you.



Your homework

The good news is that, once the installation nightmare is over, the system provides a real-time look at your home electricity use—something hard to do with other approaches, like the popular Kill-A-Watt outlet meters. If displayed in a prominent location, the effect becomes almost gamelike: how can I keep my current household electrical use to a minimum?

The display unit

It's one thing to know that your 20-year old air conditioning unit is an energy-sucking behemoth that appears to transform unholy amounts of power into noise, with a bit of cool air as a side effect. It's another to look over at a digital display next to your dining room table and see that home power usage has just jumped from 800 watts to more than 4,500 watts. Alternately, the display can show cost per hour and the estimated bill so far for that month, if money hits you more powerfully than watt-hours.

This kind of feedback allows for easy experimentation. Does opening the windows and running four fans at full blast use less power than running the AC? And if so, how much lower is it?

To read the power usage from a particular appliance, the display unit has an "APPL" button that zeroes the unit at the current level of electricity use. With that done, turn on the appliance in question and the display unit will show how much power it uses (just be careful to avoid any other changes in household electricity use, such as refrigerator cycling).

Blue Line Innovations claims that the device really will change behavior (and save money). It claims that 65 percent of people in trial deployments to date have made "long term behavior changes," and more than half check the display unit at least once a day. A 30,000 customer pilot project with Hydro One in Canada showed a 6.5 percent average electrical cost reduction over 18 months.

Going Hohm

Monitoring realtime power use is great, but if you want to chart your numbers over time, you'll need the separate WiFi gateway. Unfortunately, the gateway looks—and this is a completely subjective aesthetic opinion—kind of ugly. Not quite as ugly as the German beer stein on my office bookshelf, a stein that I once incorrectly believed was God's gift to the world of art, but still... Picture a white plastic donut with a colored light and a black power tether and you get the basic idea. (The real-time display unit is quite attractive, fortunately.)

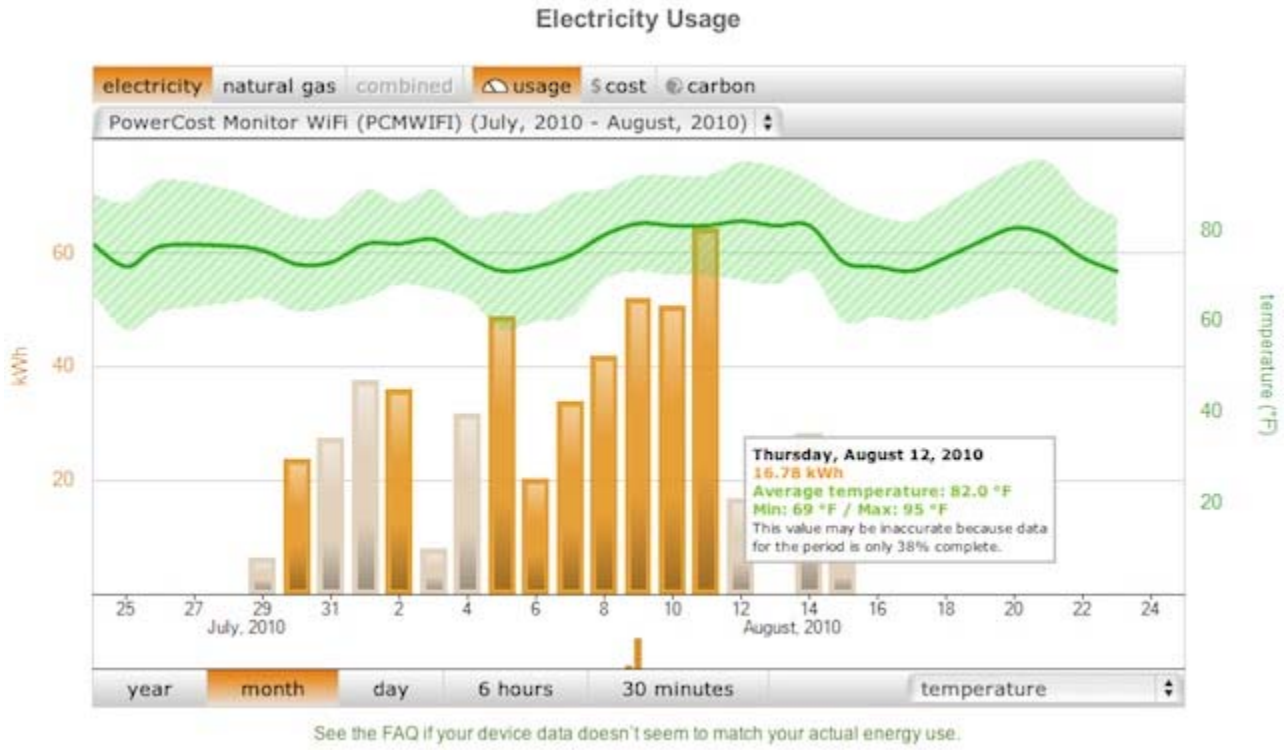
The gateway in all its donut-ness

The gateway connects wirelessly to the data sensor strapped across your electric meter and beams that information through the tubes to your account at Microsoft's Hohm site. Setting up this connection (and a Hohm account, if necessary) requires a Windows PC—something that seems doubly odd when the gateway already contains and makes use of an internal Web server. Couldn't configuration have been handled in more universal fashion?

After setup, the gateway connects to a home WiFi network (802.11b only) and sends electricity usage data to Hohm every 30 seconds. That's it.

But what this enables is pretty cool. Hohm takes this data and creates remarkably detailed graphs of electricity usage. You can drill down into these to see how power usage spikes throughout the day, or zoom out to see how power use in a given month corresponds to outdoor average temperatures.

Be aware that the gateway needs to be fairly close to both the sensor and your router. Upon checking Hohm after running the gateway for two weeks, I noticed that the last week of information was largely missing. Apparently, the gateway had been too far from the router to maintain a reliable connection; a move solved the problem.



Don't put your gateway too far from your router, or this happens

If you have a participating natural gas provider, Hohm can also grab your monthly usage data directly from the company in order to provide a better view of overall energy use. The site also asks an insanely detailed set of questions about your house, then combines all this information into a "Hohm Score"—a simple way to gauge overall efficiency.

The system "combines its own sophisticated algorithms with public record information and advanced analytics licensed from Lawrence Berkeley National Laboratory and the Department of Energy," and it can be especially useful for weighing the worthiness of home improvement projects. For instance, my own Hohm Score went from 68 out of 100 to 81 just by upgrading my old AC and furnace—and Hohm's estimate of how much I will save each year by making the change was right in line with government calculations I've done elsewhere.

Hohm offers suggestions for improving your energy efficiency, along with rough estimates of how much the work might cost and how much it might save per year.

Worth the cost?

The basic sensor and display unit sell for around $100 (an earlier Black & Decker-branded variant can be had for around $65). If you want to connect the device to Hohm and to see usage trends, the WiFi gateway adds another $150.

Personally, I found the most value from the basic real-time display. Stick it in some well-trafficked spot and you're sure to see it numerous times per day, getting a decent sense of

how your home's power load varies through the day and throughout the year. As for Hohm, it's a nice site and well worth using, but it can also accept manual electric bill input at the end of each month. Unless you really need to chart your power usage throughout the day and to see detailed graphs throughout the month, the WiFi feature will probably be superfluous for many users, given its cost.

Gadgets like the PowerCost Monitor and sites like Hohm remain in the early stages of development, though they point to an exciting future in which exposing people to better information allows them to make better choices.

As for me, a few weeks with the monitor have turned my already-advanced efficiency instincts into a full-blown case of "Hey, kids, please turn that light off when you leave the room," and I raised the air conditioning from 77 to 79, the point at which upstairs bedrooms are simply too sweltering to sleep in. Will I save my 6.5 percent? It's too early to say—but I'm saving *something*. And it feels more like playing a game with real money at stake than being "guilted" into going green—a perfect approach for those whose environmental instincts benefit most from seeing what they save.