

Home Energy Monitoring, Part 1: Knowledge Is Power

The first step in doing something about the energy consumption of your home is to know what it consumes and how it consumes

Posted on Jan 18 by [Christopher Briley](#)

For this episode, Phil and I are joined by Peter Troast of [Energy Circle](#) to discuss home energy monitoring. Most people, I think, live their lives without much thought given to the power they are consuming when they turn on a device. They're more focused on the task at hand.

The generation, transmission, and environmental impact of those electrons streaming into the home is a matter to ponder, on occasion, but what if you had a dashboard for your home that could give you real-time and historical data on how much power you are consuming, or how much power each circuit is consuming and when? That is exactly what home energy monitoring does. And with this knowledge comes the opportunity to change your behavior, and maybe a few fixtures and appliances while you're at it.

In Part One of the podcast, we discuss:

- Peter Troast and what he does for a living
- The recipe for the Pomini (remember to relax—this stuff is easy)
- Why to monitor your home
- How Peter himself reduced his own household consumption by roughly 29% just by an increased awareness of his home's energy consumption
- How much the average house would save (between 5% and 15%, but there's no precise study on which to base a claim)
- What you learn by monitoring
- Whether success is dependent on human behavior

Enjoy the show. If you have your own home energy monitoring experience, be sure to share it with us in the comments section at the end of the blog. Cheers.

TRANSCRIPT

Phil Kaplan: We have a special guest today. We're very excited to have Energy Circle's own Peter Troast. His Energy Circle website is well known in many circles, not just around here. The tagline is: Your Complete Home Energy Resource—Tested Tools, Smart Advice. That kind of says it all. His website is a wonderful wealth of information and knowledge—not just about energy tools and products but also air sealing, insulation, and the strategies we talk about all the time as architects. And he is a king tweeter extraordinaire.

Peter Troast: Chris, Phil, it's great to be here.

Phil: Welcome!

Chris Briley: It's our pleasure. We chose this topic because it's one we want to learn more about. I want to get into home energy monitoring and use it as a management system and an education tool for the client.

Phil: It is important for the client. When we talk about it from an architectural standpoint, you may think we're just talking about pretty buildings and energy performance. But it's the whole package. The idea that these things come in after the fact...people want to know "OK, how'd I screw up? How much better could I have done if I had thought about it before instead of after?" We're trying to get people's attention on energy from day one, so the idea of integrating and having these conversations as architects instead of building forensics guys or energy auditors is important.

Peter: You guys can only go so far, right? You can build a fantastic building with a great envelope that's great from a thermal standpoint, but at some point you turn that building over to the owners, and it's that plug load piece—that day in, day out electricity use—that you really don't have any control over. You can spec LED lighting or a really efficient air-conditioning system, great appliances, but it's out of your control at that point. That becomes a really big opportunity, that whole plug load selection that is in the hands of the homeowner. Part of what this whole monitoring thing is about is giving them the tools to understand what they're using and then behaviorally start to change how they use electricity on a day-to-day basis.

Chris: Cause it can be like a year before you see the client again to ask how the house is performing, how much oil did they burn...

[Before getting down to brass tacks, the guys break to talk about the Pomini.]

Phil: So, Peter, tell us about Energy Circle.

Peter: Well, we need to address energy use in the residential sector. Buildings are just taking up way too much energy and contributing way too much to global warming, and it's a big task to take on 124 million U.S. homes, all of which are very ripe for energy reductions of various kinds. Our approach is to arm the homeowner with good information—to take the complexities of what you guys know intimately about architecture and building science and building design, and try to boil that down into something digestible and understandable at the homeowner level. And push people toward that starting engagement point for taking on their energy use—and that might be an energy audit or starting to monitor what their energy use is, in real time, on a day in and day out basis. We find that when people achieve that threshold and start to think about it, there's a whole series of snowball effects that may result in a real retrofit and a reduction, or we may sell them some smart strips or programmable thermostats or address their lighting issues—all of those things that are relatively easy to do, once you get started.

Phil: One thing that impresses me about your site is that's not all you do—you're not just there to sell stuff. Other people are interested—the New York Times found Energy Circle, Boing Boing found Energy Circle, and a bunch of others.

Peter: Our notoriety started two Earth Days ago. We monitor our electricity, but we decided to put my family's house online, live, on the Energy Circle website so that anyone can see what our electricity use is in real time. We figured that was the ultimate statement—we were willing to go public with it. We had a little family meeting to make sure we were ready to take this on, because the world was looking in—and will we be able to perform? That's what got it started.

Chris: Did you find that it changed the way you and your family use electricity and energy in general?

Peter: Absolutely. Since two Aprils ago, a 29% reduction in household electricity...

Chris: Wow! Just because you're watching it?

Peter: I think so. We did not reach 29% by running out and buying a whole house full of LED lights. We're not huddled around a Bunsen burner; we're not living in squalor. We are a pretty typical household. We're gadget lovers. That was the New York Times lede: Here's a family of four, two kids, more iPods than you can shake a stick at, there are multiple computers, a home office—we are not light users of electricity. Now let me pause a second. We're gadget lovers. At the same time, we're not, by typical national standards, an electricity-intensive house. We don't have air-conditioning. We heat with oil. We bake with electricity, but our cooktop is propane. So we're not a super electric-intensive house, but I think that's what makes the 29% reduction that much more significant. When you're ready, I can talk about why that happened to us.

Phil: Well, it's an interesting question. This is your business, you're focused on it—29% is fantastic by any measure. But what about the typical homeowner? Are there statistics?

Peter: I've spoken with Michael Blasnik from Boston, who is probably the world's foremost energy statistician, and there are some studies about the impact of monitoring, but they're small and in his words are deeply flawed. The results of those studies say the typical reduction when you start monitoring is between 5% and 15%. One that got written up in Home Energy magazine had a sample size of 20. Another is a little group of people on Cape Cod. So the bottom line is we really don't have a great quantitative study to support this idea that active monitoring results in reductions. Now, we've got lots of anecdotal evidence—our story—and so forth, and our customers speak very highly about it, and we see the results constantly, but I don't think it's proven yet in a statistical way that we can say, "Absolutely, when you monitor, you'll achieve a reduction."

Chris: If I'm your customer, what can I expect to monitor, what am I going to learn?

Phil: What precisely are we measuring?

Peter: One of the things I like to point out is that we're talking primarily about electricity. Depending on where you are in the country, we know that electricity is one of the inputs. There's a lot of work being done, and some of the devices we'll talk about have a lot of promise in measuring the other forms of energy we're using, like gas and oil that are being used for heating and cooking and domestic hot water. But right now we're talking about electricity—and that's a limitation, right?

Phil: Do you think it's disingenuous to talk about energy monitoring when it's really just electricity?

Peter: That's a good point. We've done our best with the language on the Energy Circle website...

Phil: It's not just you guys. It's kind of across the board.

Peter: It is. What we try to focus on is those products that have a level of consumer acceptance, they're ubiquitous, and they're not too difficult to get up and running. Part of the game here is simplification, making it easy. You guys have seen the installations of HOBO monitors, jerry-rigged things, data monitoring—that tends to be out of reach of most homeowners. And what we're really trying to do is offer a variety of products that are really quite simple.

Phil: Really this is all about human behavior. We have a lot of talks internally in our office about how much you can control for people. Can you shut the windows automatically? Can you count on them firing up the woodstove if they need it? Well, not for generations down the line who don't know as much as you know about the house.

Things have to be dummy-proof. You're taking a risk if you're counting on people to act in a certain way. So, is it true to say the success of this is the behavior of the individual? There are personalities more suited to this, and how does one control that?

Peter: I think for our audience in the green architecture world, for homeowners who are taking the time to hire people like you guys to build a serious house from an energy standpoint—these are people who are predisposed to do something. What's missing from the electric bill that shows up every month is enough information to be able to act. One of the great lines is “There's less information in your monthly electric bill than you get from a teenager coming home at 12 o'clock at night.” You get how much you use each month and maybe 13 months of historical record, but the makeup of what happened that month isn't there. So the view of those of us who believe in the real-time monitoring concept is your behavior will change with the information. Classic management line: If you can't measure it, manage it. I think the number-one reduction we achieved when we started monitoring is basic awareness that we left something on. You've got this thing in your kitchen that says 1400 watts, and you have enough knowledge of what's going on in your house to know you shouldn't be at 1400 watts right now—who left the TV on? And that alone has really made a huge difference.

Voiceover: That's it for this part of the episode