



How to Get FREE Energy





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By Ted Bauman, Editor, *The Bauman Letter*

LET'S face it: We Americans love getting something for nothing. Whether it's a two-for-one sale at the grocery store, clipping coupons for 20% off, or just finding a \$1 bill lying on the sidewalk, seeking bargains is part of our consumer DNA.

So what if we said you can get access to FREE energy for your home right this very moment? Hard to believe?

Well, think about it this way. You pay an electricity bill every month, right? And depending on where you live, sometimes a bill for natural gas or heating oil too.

But if we could show you how to stretch the amount of electrical power you consume now ... or be able to use less, still live the same lifestyle you always have but pay less? That's what this report is all about: getting FREE Energy by being a smarter buying and consumer of electrical power.

In the next handful of pages, we're going to begin by talking to you about small, inexpensive ways you can start getting FREE energy in your home today. Later, we'll discuss solutions that allow you to save large amounts of energy, but carry a larger price tag to match.

Every solution in this report is effective at helping lower your monthly energy bill. Which solutions you'll want to employ depends, ultimately, on how much energy you want to save, and other factors only you know the answer, such as whether you're an owner or a renter, and how long you intend on living in your current home before moving.

We can talk more about those factors in a few minutes. First, let's get started looking at the many ways you can find FREE energy by just using what you have more efficiently.

• **Turn Off the "Energy Hogs":** According to the Energy Information Administration, most Americans spend about \$1,351 per year for electricity — that's about \$112.59 a month; household appliances account for the bulk of that cost.

For instance, that cellphone charger you have plugged in to the wall all the time? When your smartphone is connected, the charger is drawing between 2 and 6 watts of power. But when it's not connected, the charger is *still* consuming a quarter of a watt or more, all on its own.

Now, a half watt of electrical power, consumed 24 hours a day, 365 days a year, doesn't add up to much — about an extra nickel a year.

But that's just one device. Check out the table on the next page and look at how much power every other device in your home consumes on average, from computers to coffee makers, when it's "off" — but still connected to its electrical power source.

How much does all that needless energy consumption add up to? In the table above, it's a little over \$100 a

year, or about \$8 a month — roughly 7% of the average American's monthly power bill.

From a practical standpoint, of course, you can't go around unplugging devices every time you're finished using one. But leaving all of them plugged in wastes money too.

That's where energy monitoring devices can help. A number of companies make them, and they're very helpful for controlling your power use in these easy-to-overlook areas of your household. For instance, Belkin makes an entire line under the Conserve brand, and P3 International makes a line called Kill A Watt. Depending on the model, you'll spend between \$20 and \$40 for a small device that shows in real time the amount of energy consumed by your appliances. Kill A Watt even make a wireless version that monitors outlets from 300 feet away, as well as a power strip that can monitor up to 10 electronic appliances at ones.

Device	Power Consumption When "Off"	Cost Per Year*
Set-top box with DVR	36.68 watts	\$32.14
Game console (ready mode)	23.24 watts	\$20.36
Desktop PC (sleep mode)	21.13 watts	\$18.51
Printer/Scanner	5.26 watts	\$4.61
CD player	5.04 watts	\$4.42
Laptop charger	4.42 watts	\$3.87
Central Heating Furnace	4.21 watts	\$3.69
Audio receiver	2.92 watts	\$2.56
Digital scanner	2.48 watts	\$2.48
PC speakers	1.79 watts	\$1.57
DVD player	1.55 watts	\$1.55
Cordless power tool	1.74 watts	\$1.52
LCD/LED television	1.5 watts	\$1.31
PC screen (sleep mode)	1.38 watts	\$1.21
Coffee maker	1.14 watts	\$1.00
Smartphone/tablet chargers (assumes US avg. of at least 4 per household)	1.00 watts	\$0.88
Room A/C Unit	0.90 watts	\$0.79

SOURCE: Lawrence Berkeley Nat'l Laboratory & EnergyUseCalculator.com
*Assumes U.S. average \$0.10 price per kilowatt-hour

These devices measure energy use in kilowatt-hours (kWh), which is the same measurement used by electric companies. Enter the rate charged by your electric company, which can be found on your monthly bill or online account, and the device calculates your daily, weekly, monthly, and annual expenses being used by each appliance. Energy monitoring systems show you which appliances are worth unplugging.

A typical family of four can save \$500 per year by shutting off the energy hogs when not in use. Free energy also means not wasting what you have. For under \$40, it's hard to get a better return on your money.

• **Insulate Your Water Heater:** When it's cold outside, you wear a jacket to stay warm. What about your water heater? Heating insulation jackets are just what the name says — a thick layer of insulation, usually pre-cut to fit the specific dimensions of the water heating in your home for easy installation. The more heat your unit retains, the less electrical energy it requires to reheat the water in its tank when you take a shower or wash dishes.

You can check your water heater's R-value, which is a measure of its insulating qualities. If your water heater has a rating of at least 16, you probably don't need an insulation jacket. If you have a new water heater, it will probably have internal insulation already. If you can't find your heater's R-value, do a simple touch test: If the tank feels warm, you'll benefit by using an insulation jacket.

• **Seal and Insulate These Areas:** You don't realize it, but your windows and doors "leak" heat to the outside when it's cold. And during the summer, if you've ever wondered why some rooms always feel just a bit too warm, no matter how low you put the thermostat, then you're probably losing a significant amount of your cooling energy too.

Take a look at the chart to see just how much energy you lose from these and other areas, simply because of tiny "air gaps" in and around these parts of your home.

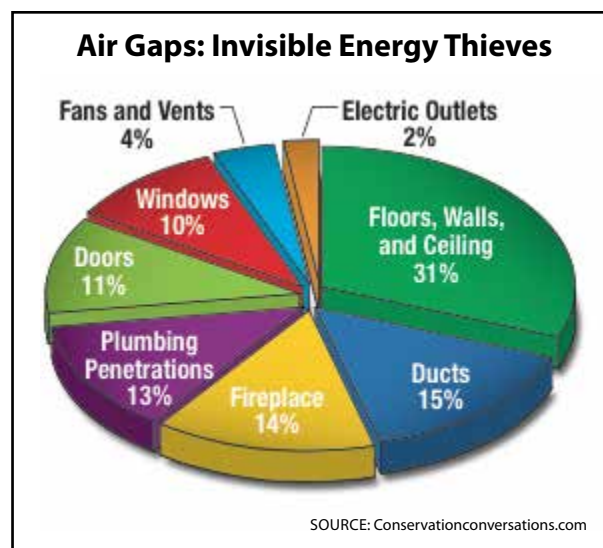
How to fix? For windows, use a product commonly called “insulation plastic” or sometimes “shrink to fit plastic wrap” made specifically for existing windows. It’s a quick, cheap way to provide insulation by keeping the cold out — and heat in.

Insulation plastic can be purchased in small kits for under \$10. Simply seal it around the window with the included double-sided tape; keep a hair blower handy, put it on its “heat” setting and aim it right at the plastic. It will literally shrink to fit, forming a nice tight seal over your windows. It’s a small change that makes a dramatic difference in your monthly bill.

What about your doors? First, examine all the doors in your home that open on to exterior areas. There should be what carpenters call “weather stripping” running around the sides and top of each door frame. Is it worn, cracked or missing? Does it look too thin?

You may want to replace it with new weather stripping, which you can purchase in a hardware store or big-box retailer in rolled-up seven-foot lengths, at a cost between \$8 and \$25 per package.

While you’re at it, don’t forget to look at the bottom of the door. You should see a door seal of some kind, usually made of ribbed rubber and plastic; it’s designed to help fill the slight gap between the floor and the door itself. They’re easy to replace, cost about the same as the weather-stripping solution above, and go that much further to keeping as much of your heating and cooling energy inside the house (instead of leaking out).



Use “Mastic Mud” for Big Savings

While you’re looking for air leaks in your home, don’t forget to check your ventilation ducts! These rectangular metal channels wind through your walls, floors and attics, and transmit cold air (if you have central air conditioning) and warm air from the heating unit to your home’s living spaces.

It’s not uncommon for these ventilation tubes (which are usually constructed from sections of sheet metal) to develop leaks, which makes your system less efficient and more costly.

It takes a little time to identify the leaks, but it’s well worth the effort. Turn on your system, and follow the main duct that carries hot air to the rest of the house. Often, you’ll find leaks in the areas where the main duct branches off into smaller tubes (which carry hot air to individual rooms of your home). Perhaps the original installers of your home’s ventilation system were in a hurry (and never properly sealed the ducts to begin with). Or the ducts might have sagged a little over time, creating small gaps.

Either way, these small leaks are easy to fix with a gallon bucket of “mastic duct sealant.” It’s nontoxic, and you can buy it at nearly any home improvement store. And you can apply it easily with a paint brush to the outside parts of any of your ventilation ducts. Once you’re done, you’ll have a more efficient HVAC (heating, ventilating, and air conditioning) system, and a smaller energy bill at the end of each month.

“Optimize” Your Stove and Cooktop for Savings

Before I started working on this report, I thought a stove was a stove. You turn it on, make sure the heating element or burner is working, put on a pot or skillet, and that’s that.

And you know what? I couldn't have been more wrong.

For instance, if you own a newer gas or electric range, check out the control knobs. It may have a setting that allows you to use convection-style cooking. What's the big deal about that? It saves a lot of energy because it uses an internal fan inside the oven to recirculate already-heated air (instead of burning more gas or using more electricity to generate additional heat).

The U.S. Department of Energy says you can use up to 20% less energy simply by using a convection oven instead of a standard oven. You can save even more if you already own other types of cooking appliances, such as a microwave, or a toaster oven, that you could use instead, in order to cook the same meal (see the accompanying chart for a cost comparison).

And believe it or not, the type of cookware you use can also make a big difference in your energy bills! For instance, flat-bottomed pans and pots heat up to optimal temperature faster than scullery with a slightly pushed-in "concave" bottom. The U.S. Department of Energy says it takes 50% less energy to bring water to its boiling point (212 degrees Fahrenheit) with a flat-bottomed pot compared to its concave-bottomed cousin.

The material your pots and pans are constructed from also makes a difference in your energy consumption. Copper-bottomed cookware is often a little more expensive to buy, but it heats up faster, using less gas or electricity to bring your food up to optimal cooking temperature.

Finally, *size* matters. When you use a particular pot or skillet, match it to the appropriately sized burner on your range. In other words, if your pan has a 6-inch bottom to it, and you're cooking with it over an 8-inch sized burner on your stove, then up to 40% of the burner's heat is completely wasted. Likewise, if you're heating up a large pot of water, but you have it on a small burner, it will take an excess of energy to bring the water to boil. Just keep saying to yourself: Use the right pot on the right-sized burner.

Same Meal, Different Appliances, Different Costs

Appliance	Temperature	Time	Energy	Cost
Electric oven	350F	1 hr.	2.0 kWh	24 cents
Convection oven	325F	45 min.	1.39 kWh	17 cents
Cooktop fryer	420F	1 hr.	0.9 kWh	12 cents
Toaster oven	425F	50 min.	0.95 kWh	11 cents
Crockpot	200F	7 hrs.	0.7 kWh	8 cents
Microwave oven	"High"	15 min.	0.36 kWh	4 cents

SOURCE: ACEEE (*Assumes national average of 12 cents/kWh)

Buy or Borrow a Thermal Detection Device

Here's the thing about finding cooling and heating "leaks" in your home — sometimes it's hard to really tell where they're at. And if it's not something obvious — like a draft, or a visible gap or hole in a door frame, window seal, or wall — well, you're taking a "best guess" at fixing these problems.

Today's technology makes it easy to find out with a device called a "thermal detection device" (they're also sometimes called "noncontact infrared thermal leak detectors."

They look a little like a policeman's radar gun, with a pistol handle, a big screen on the back and the infrared temperature sensor projecting from the other end. In the past, these devices cost several hundred dollars or more. But lately, a few companies now make these high-tech energy leak detectors for less than \$50; you can usually find one or two brands at your local hardware or big-box home improvement store.

Here's how they work: Simply set the current room temperature as the reference point. Then you literally point the device at doors, windows, walls, ceilings — anywhere you suspect energy may be escaping. Within a

second or two, the infrared thermometer can “see” the differences in temperatures of the materials it’s aimed at; some devices even change screen colors to show you when it’s pointed at extremes of hot or cold. Presto! You’ve just discovered the leaks or cooled or heated air that are robbing you of lower energy bills.

Room Occupancy Sensors

Do you forget to turn lights off? It’s easy to do, and one of the biggest drains on energy. Technology can now take care of that too. Lutron Maestro makes an occupancy sensor, which looks like a dimmer switch and must be hard wired to an existing light switch. The unit has a sensor on the faceplate that detects when someone has entered the room. It turns the lights on upon entering and off when leaving. You can even adjust the “time out” delay so that lights stay on from one minute to thirty minutes after exiting. Room occupancy sensors are also handy when you typically have your hands full such as when entering and exiting the laundry room. Let the technology save you money by remembering to do the work for you.

Smart Power Adapters

Remember at the beginning of this report, and our discussion about “energy hogs” in the form of cellphone chargers and the like?

Several companies make so-called “smart” power adapters (sometimes called “smart charging stations”) to help you manage these little devices more efficiently. One popular brand is Green Plug; its adapter detects how much energy the receiving device will need, using technology the company calls a “digital handshake.”

Once your device is charged up to 100%, the Green Plug automatically shuts off. Each time it’s used, it’s saving just a little more money for you — compared to a “dumb” adapter (like the one that probably came in the packaging with your device) that doesn’t know when to stop. Other models shut off after a fixed amount of time, say four hours, which is usually enough to charge a cell phone or laptop.

Whole House Monitoring

If you have a lot of electronic devices, it may not be easy to find which devices are leaking energy. You may want to explore “whole house” energy monitoring systems, such as one called The Energy Detective (or TED, for short). TED’s devices clamp right on to your circuit breaker system, and by doing so, can “see” all the energy your home is using.

The TED device relays this information to your home computer or device. Armed with that kind of data, you can see how much energy each of your appliances — coffee makers, refrigerators, microwaves, televisions, computers, the works — uses, so you can figure out if it’s excessive or not.

A TED device isn’t cheap — it costs between \$200 and \$450. So you’ll want to think carefully about how much energy you’ll save over the course of several years or more before deciding whether it’s worth the investment to buy one. On the other hand, it’s easy to underestimate how much energy our myriad of electricity-consuming devices actually use month-by-month, year-by-year. They’re well worth the price if you’re serious about saving energy but have too many electronic devices to monitor.

Let Smart Hubs do the Work

So maybe you’ve identified a number of appliances in your home that consume more energy than they should, and could be shut off and turned on (and make your home a more efficient user of energy)? Several

companies including Samsung, Wink, Swann and Insteon now make digital interfaces (also called ‘smart hubs’) to help you do just that.

A smart hub is a small, flat device that plugs into the wall and syncs to the Wi-Fi system in your home. It allows you to communicate with many of your digital devices by way of an app that you can download and control from your smartphone or tablet. Depending on features, plan to spend between \$50 and \$200.

Once connected, the hub allows you to operate many different devices — even if they’re different brands. You can control just about everything you can think of including lights, thermostats, appliances, door locks, and surveillance cameras.

Smart hubs are great solutions, because they automate the job of unplugging or switching off your energy-draining appliances. As long as you have an Internet connection, you can control your home’s electrical appliances from anywhere in the world.

Smart hub apps also allow you to set automated rules to turn lights on and off at particular times, or according to sunrise and sunset hours. The app will also show energy usage, so you’ll see the dollars you’re saving. Set it once, and you’ve got free energy — and instant cash.

Solar Panels for Big Savings

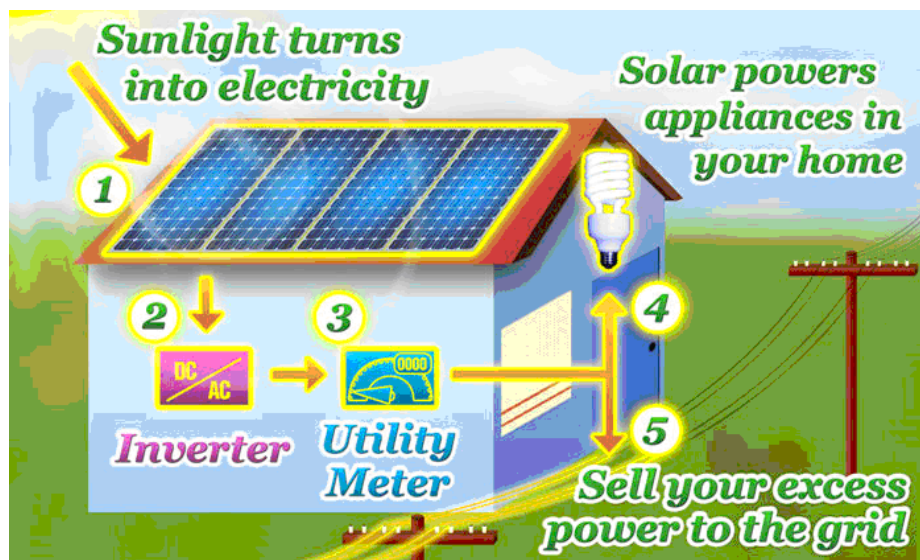
A decade ago, roughly 30,000 homes in the United States had solar panel installations; today that number has skyrocketed to more than 1.7 million solar installations within the U.S.

Even so, that’s just 1.3% of the energy generated. The Solar Energy Industries Association predicts more than 14 gigawatts of solar will be installed annually by 2023.

The wide adoption of solar tech comes from advances in efficiency that allow each panel’s array of “photo cells” to gather far more energy than previous generations of panels. A few decades ago, solar panels were more of a novelty, and a public display of “going green,” more than anything else. Today, solar panels have real benefits; depending on where you live and the size of your solar panel system, they can potentially generate 100% of your home’s energy needs.

A bank of solar panels, on average, costs upward of \$20,000 to install. That’s a lot of money, but before you cringe at the cost, consider the benefits:

- A typical panel will produce about 200 watts of electricity during daylight hours. So, with 10 panels on your roof, you’d create 2,000 watts of power for your home (the output of solar panels is expressed in a measurement called “kilowatt hours” or “kWh” for short). So 2,000 watts would be the same as 2 kWh.



- For the average U.S. home consumed about 909 kilowatt hours (kWh) of electricity each month.

- Solar panels have a “maximum power rating,” which shows you how much power each panel will produce under ideal sunlight conditions. The more sun you get, the more money you save.

Where They Work Best: Sunny, cloudless regions, such as California, Arizona and New Mexico, typically receive more than five full hours of sunlight each day. In parts of the country where there are many partly cloudy or cloudy days, peak sun conditions may only last for a few hours each day. Even so, solar panels still produce electricity under less than ideal conditions; they’ll just produce less than their peak capacity.

Sell Your Excess Power: For practical purposes though, most solar-powered homes stay connected to the main utility power grid in their respective areas. However, electric companies can set up your home with a special device that allows what experts call “net metering.”

All that means is that when your solar-powered home is generating more power than it’s using — the special meter “sells” the excess power back to the utility company. When your home is consuming more electricity than it’s generating (such as when you have the air conditioning on), the meter allows sufficient power from the main grid to flow back into your home.

That’s why they call it “net metering” — your home isn’t just consuming power; it’s generating its own electricity. When its sold by the kilowatt hour back to the power company, the money is credited to your monthly power bill, lowering it by the specified amount.

Net metering is a great solution since you’re not completely disconnected from the grid, and will always have reliable electricity regardless of the conditions. However, make sure you check carefully with your local power provider. In some areas of the country, net metering is increasingly widespread, and so popular that some local utilities are trying to cut back on the credits to homeowners for their solar-generated contributions to the power grid.

Is It Worth the Cost? Recently, Google created a service it calls “Project Sunroof” — a system that calculates your home’s potential for generating solar power. It creates a 3-D model of your roof, and — using Google’s satellite imagery, mapping systems and Internet weather data — estimates how much sunlight will reach your solar roof panels (along with how much money you could save over 20 years).

Not everyone has access to Project Sunroof; in early 2016, Google said its offering the service to selected areas within nine states. Type “Project Sunroof” into your browser to check on availability in your home’s area and to receive updates from the company.

You can also check out Weather Underground’s solar calculator. Just enter your address, and you’ll see the average amount of sunlight that hits your home. Access the calculator by typing “wunderground.com/calculators/solar” into your computer’s browser.

Resale Value: If you’re planning to sell your home soon, buying solar panels can help to increase your home’s value.

Leasing: You can also lease solar panels, instead of buying them outright. To do this, you sign a document called a “power purchase agreement (or PPA)” with a company such as Solar City, Sunrun, SunPower, and Real Goods Solar. The leasing firm pays for the installation on your roof; they also own the panels. In return, you pay a fixed monthly rate that would be much lower than you’d pay from your local electric company.

Solar panel leasing is a popular option for some homeowners. But it’s not for everyone, especially if you are thinking about selling your home in the near future. Occasionally, a potential home buyer may be “scared off,” demand a lower price or ask that the seller buy out the remainder of the leasing contract, once it’s learned that the solar panels on the roof aren’t owned by the homeseller. So, like anything else, make sure you consider all the costs, and future possibilities, when it comes to making such an arrangement.

By leasing your solar power system, you simply pay by the month. You can start with \$0 down and start

saving right away. A solar lease can be a better and more affordable investment than purchasing a solar panel system with cash because you don't have a big upfront payment. Depending on energy rates and the amount of sunlight, the savings can be \$20,000 to \$65,000 over a 20-year period. Regardless of the savings, leasing allows you to start saving as soon as you turn on the power with no out-of-pocket expense.

Smart Thermostats for Instant Savings

Smart thermostats are a new breed of thermostat that will instantly save you money. Once installed, use them like you would any thermostat. While you're making daily adjustments, an internal computer program monitors and learns your habits. It may recognize that you turn the air down to 75 degrees at 10 p.m., but up to 78 degrees at 9 a.m.. It may find you're usually gone during the day on weekdays, but home on the weekends. After about a week of observations, it knows when you're home, and which temperatures you set to optimize your cost savings. It's even programmed to account for seasonal changes.

You can also connect your smart thermostat to your phone, tablet or laptop. You can adjust your thermostat right from your couch without missing a single play of your football game, but more importantly, you can make changes if you're away. You can even download reports from the mobile app to see exactly how much the thermostat is saving you.



Two of the most popular are the Nest Learning Thermostat and Honeywell Wi-Fi Smart Thermostat. Allure Energy makes a nifty device called EverSense Thermostat that also includes GPS tracking via an Apple or Android phone app. It can sense how far you are from home and make adjustments so that you arrive to a comfortable home — without wasting energy to do so. All devices can be purchased at your local big-box home improvement center or any number of online retailers.

Smart thermostats are one the best dollar-stretching devices on the market. Most smart thermostats cost between \$100 and \$300, and independent tests show you'll save about 10% to 15% on energy bills. These savings alone will cover the cost of the thermostat in under two years.

Before you buy a smart thermostat, check with your local utility company, as many offer them for free. They'll even take care of the installation, and some offer \$25 to \$50 rebates to boot. Others offer additional cash or monthly billing credits if you participate in a pilot study. Smart thermostats are one of the simplest solutions for finding free energy — and big savings.

Eco-Friendly Smart Appliances

Most manufacturers offer smart appliances, which are any number of appliances such as refrigerators, dishwashers, stoves, washers and dryers designed to optimize energy use.

Smart appliances make subtle changes in their operating cycles in order to save you money. Many utility companies also use smart grid technology that communicate with smart appliances so as to operate off peak-rate hours. You won't notice the small changes in the way your appliances work, but you will notice the difference in your electric bills. For instance, your refrigerator may run its defrost cycle at midnight so that you're using cheaper energy, laundry cycles may be delayed during peak energy hours and your dryer may use longer cycles when you're away.

Smart devices can also be connected to the Internet, which allows them to troubleshoot breakdowns. If a common problem occurs, the smart appliance communicates with an Internet web page that sends troubleshooting instructions, so the problem can be fixed without the need for expensive service calls.

Smart appliances can be costly, so unless your old appliance needs replacing, it's probably not a good idea to get a smart appliance in hopes of quickly recovering the costs. If you feel it's time for new appliances, it makes sense to buy eco-friendly smart appliances, but be sure you're paying for services you'll use. Many smart appliances have frivolous features such as refrigerators that stream music, keep track of your eating habits, suggest dinner recipes, or allow you to see the contents while strolling down the supermarket aisles.

On the other hand, some offer more useful services such as a refrigerator that will send a text if a door is ajar, stoves that text you when your cake is done baking, or washing machines that can download customized cleaning cycles to eliminate specific stains. If you're shopping for smart appliances, don't buy them just because they have a fancy touch screen that requires countless hours of video tutorials to learn about features you'll never use. Instead, focus on ones that simplify your life — and save you energy and money.

Taking Action

Reducing your expenses is exactly the same thing as earning more money; they both put extra dollars into your pocket. That's why conserving energy is so important.

By using the tools in this report, your house stays warmer in winter and cooler in the summer. You'll have lower heating and cooling bills. In essence, you're getting more and paying less.

It's money in your pocket every month, and extra cash you can now use to pay off credit cards and other debts. But none of this counts unless you take the first step. Start with the small, inexpensive solutions first we outlined at the beginning of this report. Pick a few them take action, and many dollars' worth of free energy savings will quickly follow.

Kind regards,

A handwritten signature in black ink, appearing to read 'Ted Bauman', followed by a long horizontal line extending to the right.

Ted Bauman, Editor
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