

# What Are the Steps You Can Take Toward Making Your Home Net Zero Energy?

I don't know anyone who doesn't like the idea of saving money, which will happen when you convert your home to "net zero energy." So, what are the steps you can take to get there?

"Net zero energy" means that your home generates more energy than it consumes. With "net metering," your electric meter runs backwards when your solar panels generate more electricity than you're using (on a sunny day), then runs forward at night, resulting in zero (or less) net consumption of electric power.

Solar power gets more affordable every year. When I purchased my first 10-kW solar photovoltaic system 15 years ago, the cost was over \$60,000, but Xcel Energy gave a rebate of \$4.50 per watt, so I got a check for \$45,000 from the utility, reducing my net cost to \$15,000. Nowadays that same system would cost about \$15,000 with no Xcel rebate but a 26% federal tax credit.

While you can generate your own electricity, you cannot generate your own natural gas, so terminating natural gas service is key to achieving net zero energy. This involves some major system changes if you are currently heating your home and your water using natural gas, cooking with gas (including with a gas grill) and have a gas fireplace.

There are electric alternatives to all of these uses of natural gas, and you'll appreciate that eliminating natural gas also eliminates the possibility of a gas explosion and of carbon monoxide poisoning (unless you have a gas powered car).

Heating your home with electricity used to mean installing baseboard

resistance heating units in each room, but that is so 20th century. Nowadays electric space heating is done far more efficiently (and even-

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ly) using heat pumps. Gas forced air furnaces and water heaters are considered to have a 15-year life expectancy, so when yours fail, think of that as an opportunity to adopt heat pump technology for both functions. And a heat pump eliminates the need for a separate A/C unit, since it heats *and* cools.

Gas furnaces and water heaters *generate* heat by burning gas. A heat pump *moves* heat, similar to what A/C does. It cools your home by moving the heat out of your house. If you put your hand over the external compressor unit while it's cooling your home, you will feel the heat that was moved from inside your home. In heating mode, the process is reversed, and the heat pump moves heat from outdoors into your house. It may surprise you to know that when it's freezing outside there is actually heat that can be moved from outside to the interior of your house, but it's true. Our office has been heated solely by heat pump since November 2017, and ever since there has never been a day when the system failed to keep our office at 70°F or warmer.

A simple one-unit 12,000-BTU, 29.3-SEER ductless mini-split system from Fujitsu can be found online for \$1,961. That's a small unit, suitable for one room or a garage (a great application!). For our office, we bought a Mitsubishi system in which a single compressor

drives three separate wall units, each with its own thermostat.

A heat pump water heater (which I installed at our home) has the compressor built into the unit, above the tank. You can feel cool air emitting from it when it is heating water. I suggest putting it in a wine cellar where it'll keep the room cool without buying a separate A/C unit.

For cooking, you'll be amazed and delighted by the induction cooktops that are now widely available. I saw them used on a cruise ship for both cooking and warming surfaces, and the chefs loved them. (Modern cruise ships have eliminated natural gas because of the fire hazard.)

An all-electric home will, of course, demand more electricity, but Xcel Energy now allows you to install enough solar panels to generate double your electrical usage over the prior 12 months. That is more than enough to cover your new electric space heating, water heating and cooking needs, with capacity left over to charge an EV, too.

An important first step in pursuing net zero energy for your home is to *reduce your need for energy*, and the easiest and cheapest way to do that is to improve your home's insulation. I had **Dennis Brachfield of About Saving Heat** blow cellulose insulation into the exterior walls (not just the attic) of a 1940s bungalow I owned, and I was astonished at how much more comfortable the house became. Even if your exterior walls have batt insulation in them, there is still space in the walls to blow in cellulose.

I learned something interesting from that experience. We all know that walls can *radiate heat*, such as a brick wall in bright sunlight. Well, walls can also *radiate coldness*, or suck heat. The air temperature in my bungalow before and after blowing in insulation was the same, but I *felt* warmer and burned less gas.

You can go beyond improving the insulation of your exterior walls and attic. There are numerous places

that allow cold into your home, especially around your windows. Whether or not you install triple-pane **Alpen** windows, as we did at our office, caulking around the window frames and elsewhere can reduce the energy needed to heat your home. A blower door test done by a contractor will identify the air leaks in your home. Insulating your attic with blown-in cellulose and your crawlspace with plastic sheeting will also reduce your home's energy needs whether from gas heating or your new heat pump.

Of course, many homes, especially in older neighborhoods, can't benefit from solar power because of shading from trees or insufficient south-facing roof area, but you can purchase **community solar**. (This is also a *good* solution for condos which have no roof at all.)

The way community solar works is that you invest in solar panels that are part of a solar farm in some distant pasture. The electricity generated by your panels in that remote location is credited to the electric meter for your home or condo. One advantage of community solar is that when you move, you only need to change which meter gets credited with your solar production. Google "community solar" to learn about the many enterprises (some of them non-profit) offering this service.

Other ways of reducing energy use include replacing CFL or incandescent light bulbs with affordable LED bulbs and "daylighting" your home or office. (**Batteries + Bulbs** sell 8-packs of 60W LED replacement bulbs for \$6.79, tax included.) We have "sun tunnels" in our home and office to bring daylight into interior spaces. In fact, on a sunny day we don't need to turn on any lights in our office. It's great—and saves energy. We had **Design Skylights** of Evergreen install Velux sun tunnels at both home and office.

At [www.GoldenREblog.com](http://www.GoldenREblog.com) I have posted this article with many useful hyperlinks. Check it out!

## Green Mountain Home With Finished Basement

This Green Mountain Village brick ranch at **1474 S. Ward Court** sits on a 1/4-acre lot at the end of a quiet cul-de-sac, a half-mile downhill from Green Mountain High School. Green Mountain trailheads are also nearby, as are the Alameda Parkway and Union Boulevard commercial strips. The home itself has some nice features including an enlarged walk-in pantry, an oversized patio with pergola, and two Solatubes bringing extra sunlight into the family room and kitchen. The roof and several windows were replaced following a 2017 hail storm. A large storage shed was also added by the current owners. Visit [www.GreenMountainHome.info](http://www.GreenMountainHome.info) to see more pictures and take my narrated video tour, then come to the open house on **Saturday, Nov. 6th, 11 am to 2 pm**. Or call your agent or Jim Smith to arrange a private showing.



Every element of this ad is also posted at [GoldenREblog.com](http://GoldenREblog.com)

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