

Benefits of solar panels clear after two years

By Peter Murtha September 30



Peter Murtha yielded savings when he installed solar panels — like the ones pictured here — on the roof of his Silver Spring home. (Katherine Frey/THE WASHINGTON POST)

My wife and I considered installing solar power in our Silver Spring home after a renovation focused on energy efficiency still left us with large electric bills.

The renovation included geothermal heating and cooling, energy efficient windows and insulation throughout our 1920s bungalow, and sealing all air leaks with the assistance of infrared testing. Our starting point for educating ourselves on solar power was the DC Solar Tour in October 2011, which offered a great opportunity to visit solar users near our home and “ground truth” its costs and benefits.

The information we gleaned from the tour confirmed that we wanted a photovoltaic (PV) rooftop system. By November, we were getting proposals from five firms, including two that operate primarily in the leasing market. We were impressed with the leasing firms — and with the idea of being able to capture the environmental benefits and a bit of the financial reward of solar power while putting very little of our own money up front. However, given our plan to stay in our home for the better part of a decade, we decided that it would be advantageous to purchase a system.

The next step was vetting several companies via calls with recent customers to assess the accuracy of their production estimates and the quality of their workmanship. We also checked

reviews available through [Washington Consumers Checkbook](#) and [Solarreviews.com](#) before we ultimately hired a local solar installation company.

This company had a strong reputation for quality, a very competitive price and, unlike some of its competitors, provided choices from a range of equipment manufacturers, including the Korea-based company manufacturing panels in the U.S. that we ultimately selected.

As is typical, the installation firm we selected used a sophisticated device called a pyrometer to measure the solar radiance received on our roof. This tool essentially builds a map of the sunlight expected on a particular roofline — preferably oriented south or west — taking into account your precise location (important for determining intensity of sunlight), tree shadows and other obstructions. This information, combined with detailed data on solar variability across seasons and local weather patterns, allows one to calculate the production expected from a particular solar array. It also provides information useful in deciding how large your system should be, and what parts of your roof are most productive.

We had a limited budget and wanted the system that would be most cost-effective over the long run. For our house, this meant a system of 32 solar 240-watt panels, each roughly 5 1/2 feet by 3 feet and 2 inches thick. The overall system size is 7.7 kilowatts. The panels are divided into two “strings” of 16 each, which are in turn connected to an inverter.

The inverters convert the direct current generated by the panels into the alternating current, allowing it to be tied into “the grid” operated by Pepco. Being tied to the grid means that you in essence “sell” the power you produce to the utility — which is great when you are producing more power than you are using. It also permits you to generate renewable energy credits but means that in a power outage, you are “down” with everyone else on the block. Having a solar array also means having a special “smart meter” (supplied at no extra charge by the utility) which measures the amount of power you are producing and the amount your home is consuming, with the “net usage” reflected on the meter.

During times of year like the early fall, when you don’t need heat or air conditioning, on a sunny day the electrical meter runs backward, as your generation is greater than your demand!

Perhaps the most important metric in our purchasing decision was the estimated annual production of 9,636 kilowatt hours per year, slightly more than half of our electricity usage for our 3,000 square foot home. While we could have installed more panels, there would be diminishing returns, as they would have been placed in increasingly less productive positions on our roof. The system — installed in a few days with minimal disruption to our household — covers the south facing part of our top roofline and less than half of our lower roofline (to best avoid shadows). Because they are on the rear of the house, the panels are virtually invisible from the street, and are not even particularly noticeable from the back. They are essentially maintenance free (i.e., they don’t require washing), though snowfalls can shut the system down until the black panels absorb enough heat to melt the snow.

Our gross cost, including all equipment, electrical panel upgrades and installation, was \$35,000, which includes a five-year warranty on workmanship and between 12 and 25 years warranty on

the components. As a practical matter, the federal tax credit of 30 percent made it far more affordable, and Maryland chipped in another \$1,000 as a (taxable) clean energy grant, bringing our net cost down to under \$24K. (The federal tax credit is scheduled to be eliminated at the end of 2016.) With solar prices tumbling, a comparable system would cost 25 percent less today.

A separate financial incentive is the Solar Renewable Energy Credits (SRECs) one earns in states such as Maryland (as well as the District of Columbia) which have a “Renewable Portfolio Standard” (RPS) mandating that utilities produce a certain percentage of their energy from clean renewable energy, such as solar and wind.

Since our system went online in May 2012, we have averaged 8,860 kilowatt hour’s annually in production and have netted \$2,319 in SREC income (an average of \$122 per unit). SRECs are sold at auction and have different prices according to the state you are in — they have a much higher value in D.C. than Maryland. Virginia is among a minority of states, generally located in the South, that lack a RPS that would create a market for its rooftop production.

When you are assessing whether solar is for you, the solar installers all provide detailed information about when you can expect to “break even” on the cost of your investment, factoring in estimates of your production, usage, SREC generation and even the “opportunity cost” of the money you have invested. In our case, it was estimated that we would recoup our investment in just over nine years. Because our production is not quite up to our projection (caused by an unanticipated shadow from our eaves and some down time due to inverter issues and snowfalls), it will probably take us closer to 10 years. Still, not too shabby when you consider that after 10 years we will own a solar system providing us free electricity, with a projected useful life of an additional 15 years!

Assuming that one has a roof positioned to catch the sun and the necessary fund, the prospect of cutting one’s energy bills in half and generating valuable SREC income makes installing solar verge on “no brainer” status from a purely financial perspective.

But that’s not the only benefit: By installing solar, we have already avoided over 16 tons of CO2 emissions. We feel seriously good about doing our part to avoid contributing to climate change and the lung and heart damaging pollutants generated by the coal-fired power plants the Washington area relies upon.

Overall, we are very happy with the combination of saving significantly on monthly energy costs, lowering our carbon footprint and creating a valuable asset for when we eventually want to sell our green home!

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