

Future Sunny for Solar Energy



Utilities

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Homeowners and businesses that use a solar array for power are still the exception in Indiana, but the answer to the question: Is solar feasible here on a large scale? is YES! The long-term feasibility of using solar energy is strong, according to various experts in the industry interviewed by Indiana Living Green magazine. In fact, the number of Hoosiers who have inquired about using solar energy in their homes or businesses is noticeably up in 2008 and 2009, said Jeff Duff, senior engineer at Duke Energy. As for actual installations, the utility company has processed approximately seven in 2008, and 11 through June 2009.

"We certainly have seen an increase in calls from homeowners and businesses interested in setting up a solar array," he noted. Businesses have inquired, particularly the ones that are able to get grants, and homeowners realizing there are more attractive tax incentives. The vast majority of Hoosiers enter into an agreement with a utility on billing arrangements because it is the most practical way to operate a solar system for electric power, said Duff.

Another piece of anecdotal evidence that points to more widespread use of solar is that more solar businesses are advertising in Indiana Living Green magazine, said Lynn Jenkins, publisher of the magazine in its third year of operation.

"We have seen the number of builders who are promoting solar installations increase," she said.

Meteorological details

There are some misconceptions that may be preventing many people from considering a solar array for home or business.

One misconception is that you need a sunny climate to operate a solar system reliably, but the weather is never perfect.

"You can still generate electricity or heat from solar with cloudy conditions," said Michael Gibson, a LEED accredited professional research fellow at the Center for Energy Research, Education and Service at Ball State University. Gibson is currently working on a solarpowered cooling system. The key is to make sure the panels are set up and installed correctly in accordance with how much sunshine a particular piece of property gets, he explained.

Computer software is used to make calculations to maximize efficiency of the panels. "There is clearly defined meteorological data available now, so you know what you are getting into for a specific place," Gibson said. An experienced solar installer will be able to get the panels and do all of the calculations for you.

Michael Greven, principal at EcoSource Inc., based in Columbus, stressed that understanding how a solar photovoltaic system works will go a long way toward improving its effectiveness and getting the maximum benefit from the investment.

Everything in the home that runs on electricity should operate normally with solar power, he said. "It's a very simple program, really. You have your solar panels on your roof, and then you bring that power into an inverter, and the inverter is kind of the brain of the program. The inverter either puts the power into your house or feeds it back into the grid."

There is far less waste than traditional coal-powered electricity, which loses a lot of power between when the power leaves the grid and when it gets to your house, Greven said. He and his wife, Liz, have a solar array



Richard Stumpner's home in Bloomington has a passive solar system. Eventually the trees will shade the south side of the house in summer but allow the sun in during winter. Photo courtesy Richard Stumpner

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Solar installation at Richard Stumpner's Bloomington home. Photo courtesy Richard Stumpner

"That's one of the beautiful things about solar power on your roof; you are not losing any power from those panels through the inverter into the house. It's all right there."

More solar power for less

In June 2009, Greven and his team installed an array at the home of boB (sic) and Cindy Henning in a subdivision on the eastside of Indianapolis.

For the Hennings, the entire system, including the labor to install it, will cost \$18,000, after a 30 percent federal tax credit, and other financial incentives available to local homeowners are deducted, said Henning.

In addition to more efficient equipment, the installation was fast: It took about a week to complete.

"The panels themselves are the newest thing," said Henning. "Most of the older products produce around 175

watts. These panels produce 210 watts for the same amount of space." More powerful panels coupled with better inverters have made the cost of a solar array go down in a short time, modeling the trend of evolving technology, which typically becomes less expensive as it improves.

The Hennings have a net-metering agreement with Indianapolis Power & Light Co. The utility responded quickly after the solar array was installed. "They got the meter out within 48 hours of when we had it ready to go on the grid," boB Henning said. "We had informed them a week or two ahead of time, and then two days after we were up and running, they installed the net meter."

Greven's EcoSource, Inc., is one of a handful of solar installation companies in Indiana, but more are emerging, including Eco Energy Designs, based in Indianapolis. The company plans to launch operations in September 2009, said Luke Jackson, president and owner. Jackson and his partners think there is a real need now for this type of business in the Indianapolis area, and the public is open to the idea of solar energy. "We thought this would be an excellent opportunity to start in Indianapolis because the market is wide open," Jackson said.

Improving net metering

The idea of net metering is for customers to get a credit on the solar power they don't use in an arrangement with the utility company, according to Net Metering, An Overview, a paper prepared by Eric Cotton of ECI Wind and Solar in Fairmount. The concept is an important financial incentive designed to entice homeowners. It is one of the ways to make solar power more common.

Often, however, the wording to describe net metering is not entirely correct, explained Laura Arnold, president of the Indiana Renewable Energy Association, a non-profit organization that advocates for businesses interested in using renewable energy.

There is a little bit of a misnomer in that people refer to net metering as selling electricity back into the grid, but that's not exactly what it is, Arnold said. The term net metering comes from the concept of netting out the difference between what you need and any excess you have. You get credit for the excess by allowing your meter to literally run backwards, she said.

The Indiana General Assembly has tried to pass an expanded net metering law, which that would allow net metering for larger loads, particularly, businesses. As of this summer, the net metering rule in Indiana only applies to homeowners and K-12 schools with small capacity. Businesses are excluded from the net metering rule, and Indiana is now the only state where policy excludes businesses and other commercial and industrial customers from net metering, according to Freeing the Grid, Best and Worst Practices in State Net Metering Policies and Interconnection Standards, published in October 2008 by the Network for New Energy Choices. The legislature is expected to take up the issue again in January 2010.

A feed-in tariff is another financial incentive being explored by some utilities in the state, said Arnold. A feed-in tariff is actual cash for renewable energy produced. It is being used with success in Europe.

"What it does is it allows a customer to be paid for electricity that they are producing and putting back into the grid, regardless of their own individual consumption. With a feed-in tariff, the utility should compensate the customer on what it costs to produce the electricity," she noted.

On paper, a feed-in tariff is an even greater incentive than net metering, which is a credit, as opposed to cash. Feed-in tariffs generally apply to businesses with larger loads, noted Matthew McCardle, a spokesperson for Indianapolis Power & Light Co. Currently, IPL has filed a proposal with the Indiana Utility Regulatory Commission to expand net metering to their customers with larger loads, and to establish a voluntary feed-in tariff for customers installing systems with capacities ranging from 50 kilowatts to 10 megawatts. As part of its "smart grid" plan, Duke Energy is also proposing financial incentives for customers who want to install renewable energy systems.

Manufacturing solar?



Although the potential exists in Indiana for more pervasive use of solar power, another question with significant financial stakes lingers: Can the state be a manufacturing hub for the equipment necessary to make solar energy everyone's choice?

The answer can be found again in whether manufacturers will want to set up shop here, or whether there will be better economic incentives somewhere else, said Mark Pinto, chief technology officer for Applied Materials Inc., a company specializing in nanomanufacturing, including solar photovoltaic cells and energy-efficient glass. Pinto addressed solar energy's future in his lecture last spring at Purdue University.

Pinto cites Germany as a place where incentives have made the country a leader in the consumption and manufacturing of solar energy.

"Eastern Germany has perhaps the best incentives for factories for semiconductors and solar in the world. They are both exporting solar and using it locally," Pinto said, noting that the climate there is similar to Indiana's.

The U.S. Department of Energy will allocate \$117.6 million from the American Recovery and Reinvestment Act to speed up commercialization of solar technologies, including manufacturing. In June 2009, the U.S. House of Representatives passed a comprehensive energy bill, which allocates investments in clean energy technologies, but an energy bill has not yet passed in the Senate.

Widespread use of solar energy will happen eventually, whether the incentives are there or not, but it will happen faster with incentives, Pinto said. There are significant global considerations, too.

"The risk is that the United States will become just as dependent on other places supplying the technology," he said. If such a scenario were to result, the reason would again be better economic incentives for manufacturers overseas, and not cheaper labor.

Use what we have

For the foreseeable future, coal will play a part in electricity production in Indiana, noted Dick Stumpner, president of Stumpner's Building Services Inc., based in Bloomington. The company specializes in passive solar designs for buildings. Passive solar designs use the natural heat from the sun and no equipment, per se. Stumpner also has a solar array in his home.

"But as more and more people use solar power and producers find better ways to manufacture the panels, the cost of it will continue to come down," Stumpner said.

The investment in solar energy will only grow over time, both financially and environmentally, stressed Greven. "The situation will only enhance itself here if the rates for power go up a little bit. When we finally harness the sun, think how much more reasonable things will be." ☺

INDIANASOLARTOUR

The Indiana Renewable Energy Association will participate in the American Solar Energy Society's National Solar Tour on Oct. 3.

A first for Indiana, the tour includes photovoltaic (solar-electric), solar-thermal and small wind systems. Tour areas include Indianapolis, Bloomington, Michiana, Lakeshore and Evansville.

This is the 14th year for the ASES tour, which is held in conjunction with National Energy Awareness Month. The world's largest grassroots solar event, nearly 140,000 people toured 5,000 buildings in 3,000 communities in 2008. Tours focus on energy-saving techniques, sustainable building design, energyefficient appliances and use of green materials with real-world examples of costs and moneysaving government incentives. Details posted at <http://www.indianarenew.org/>.

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Jennifer Streisand a freelance writer based in West Lafayette, Ind., has written more than 100 business articles and taught undergraduate courses in communications at Purdue University. A former broadcast journalist, she holds an Indiana teaching license in English and journalism.

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