

# SOLAR ENERGY IS BLOOMING IN NORTHWEST WISCONSIN

State Highway 35 is a northwest Wisconsin route favored by those who enjoy touring the fall leaves display. Now you can also marvel at the amazing display of solar panels on the buildings of Crystal Ball Farms, an organic dairy farm south of Osceola and north of East Farmington. Also on Highway 35, just a little north of Crystal Ball Farms, you'll see the new Northwest Wisconsin Renewable Energy Learning Center, on property owned by Jerry Viebrock of Viebrock Construction. On October 15<sup>th</sup>, I was invited to tag along with several Polk County Renewable Energy Committee and Board members as they toured three recent renewable energy projects in their county.

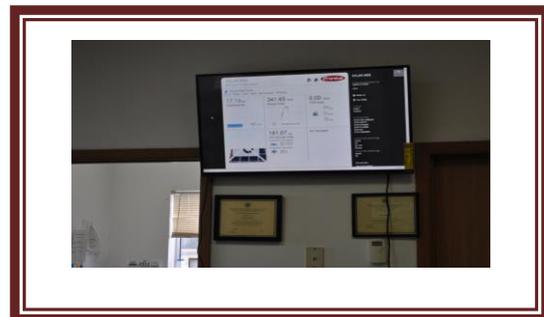


Troy & Barb DeRosier, owners of Crystal Ball Farms, made the decision to install the 151 kilowatt photovoltaic (PV) solar system on three of their farm buildings after two years of researching the technology. The arrays consist of 559 panels, each rated at 270 watts. They were strongly encouraged by



their sustainable farming values, which were influenced in part by their family situation, which requires caring for a special needs child. While being a good steward of the environment was a main driver in their decision, "the numbers had to pencil out" according to Troy, "making this large of an investment needed to make economic sense." The total cost of the system was \$300,000.00. Their utility (Xcel Energy) is a Focus on Energy participant so

they qualified for a 25% grant and a 30% federal tax credit, which can be claimed over several years, offsetting any federal tax liability. They can also offset some of their tax liability by taking advantage of the 5-year accelerated depreciation of the system allowed for businesses. They missed out on a USDA Renewable Energy for America Program (REAP) grant because other systems were funded ahead of them, but they feel good about their investment, which they expect will pay for itself in about five years.



Even on a cloudy day, like the day of the tour, you can see electricity being generated by looking at the 8

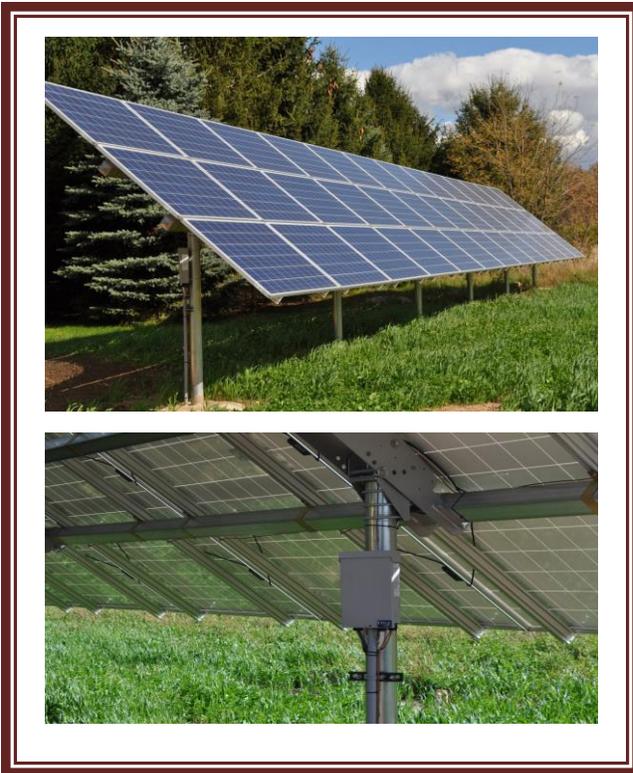
inverters on the one building or the real time monitoring system in the dairy store. Troy and Barb are very proud of their decision to invest in PV solar.

The installer, Foley Quinn, Next Energy Solutions, Inc., of Spooner, is particularly expert in helping large farm operations like this dairy analyze their energy needs and determine solutions that meet the farmers' goals. "Once we determined Troy and Barb's needs, we put together all of the paper work for their grant applications and worked with the funding sources and the utility to make sure we were identifying the best possible solution for them. The system was just connected to the grid a couple of weeks ago so we are now working to tweak anything that is not quite working properly." Quinn explained that the only problem they are experiencing is a slight problem with the WiFi connection, which is how the data is being transmitted to the monitoring system.

The DeRosiers have a goal to be as close to 100% of their energy needs being met by solar as possible. Their next step is

to work with Quinn on LED lighting upgrades and other efficiencies. As most farmers know, whenever you add to your electricity load you have to be aware of possible stray voltage problems. Quinn explained that "Xcel Energy was wonderful to work with. Once we had all of the PV solar system in place

and on-line, Xcel Energy returned to make sure any stray voltage problems were eliminated by adding additional grounding."



While not as large a system as on the Crystal Ball Farms, Jerry Viebrock and his wife Nancy have big plans for their 10 kilowatt PV system. The array consists of 39 panels, each rated at 260 watts. Viebrock's system was installed by Kristopher Schmid of Legacy Solar, Frederic. The system is grid-tied with Xcel Energy, who worked closely with Schmid to make sure they had a successful project. Schmid is an engineer and certified solar installer, a specialist in light commercial and residential PV solar. The Viebrock array rests on a ground-mounted, multi-pole rack that is seasonally adjustable (45° spring/fall; 30° summer; 50° winter) to follow the position of the sun. "The poles are in

concrete footings 5' deep and the system is designed to withstand 90 mph winds and will shed snow on

Environmental and economic impacts of Crystal Ball Farm's PV system:

- 17,449 barrels of oil not produced
- 15,724,800 miles not driven
- 128,128 acid rain emissions not discharged
- 57,596 pounds of smog emissions not produced
- \$875,000 in electrical savings
- Equivalent to planting 31,610 trees

its own if adjusted to the 50° winter angle” explains Schmid. “The polycrystalline panels are guaranteed to withstand 1-inch hail and are rated for 70 mph winds.” According to Schmid, the polycrystalline panels are a little less costly but also a little less efficient than the monocrystalline panels. The multi-pole ground mounted system has advantages over a roof mount in that you can easily change the angle with the seasons; PV panels are more efficient when they are cooler and not having a roof under them helps to keep them cooler; and you don’t have to worry about a supporting structure failing, causing damage to the panels. This is why Schmid will not even consider installing solar panels on a roof that is more than 10 years old. Disadvantages include having to excavate the footing holes and some people don’t like their view including an array of solar panels.



Part of the Viebrock installation includes an electric vehicle (EV) charging station, which I had plans of using to recharge my Chevy Volt while we toured the project sites.

However, Kristopher Schmid showed up with a 100% electric Nissan Leaf, so I relinquished the charger to him since my car has a gas generator backup and would have no problem making it back home. It is a sign of progress when two EV owners are competing for use of the newly installed charger in the rural area of Osceola. Schmid is able to drive 60 miles on a charge, which takes about two hours to fully charge. The Leaf does have the capability of “fast charging”, which is a special electrical charge connection that takes about 15 minutes but he uses that option very sparingly – “it can be a little hard on the battery” he explains. For now, there is no fee to charge your EV at Viebrock’s charging station.

The Viebrocks invested in the PV solar system and learning center because Jerry feels very strongly that “we need strong leadership in educating the public on the truth of how wise investing in PV solar is.” The Northwest Wisconsin Renewable Energy Learning Center will provide a location for the public to participate in tours of systems, learn of funding opportunities from a variety of speakers, and learn from the experiences of those who have already invested in a system. “I have always been interested in the environment” he said. “I can remember high school chemistry class talking about the impact of pumping carbon into our atmosphere would have. I want my kids and my grandkids to have a livable planet and I’m worried we are not doing enough to make sure that happens.”

While Jerry is mainly motivated by his strong environmental stewardship values, he also recognizes that, between the cost of PV solar dropping so quickly and the availability of grant programs like Focus on Energy, installing a PV solar system is a wise investment. “While you have to show that you are financially viable and can fund the project up front, between the 25% REAP grant, the 30% federal tax credit, and--because this is a business--accelerated depreciation, my wife and I decided it was a sound investment and we feel pretty good about it,” said Jerry. He also shared his opinion that “clean, renewable energy is the perfect economic development for a thriving farming community. Even if a farmer were to set aside a couple of acres and fill it with PV solar panels, they could generate an income far more lucrative and predictable than, say corn or soy beans.”

The third site we toured was Common Harvest Farms, an organic community-supported agriculture (CSA) business, owned and operated by Dan Guenther and his wife Margaret. The CSA has been operating at its current location (west and a bit south of East Farmington) for 17 years. They have 10 acres and employ five to six full-time people, depending on the season. “We were intrigued by our neighbors just north of us who have a 3.5 kW top-of-pole mount system that Kristopher installed a couple of years ago” explains Dan. “We talked with them and learned they had about a \$230 electric bill for the entire year. We became very interested in solar” he said.



Dan explained that about 40% of their electric use is for water irrigation so in the wetter years their electric use is down. They are also very efficient in their lifestyle and use about 8,000-11,000 kWh/year.

Kristopher Schmid also installed this 10.5 kW system consisting of 27 monocrystalline panels, each rated at 280 watts. “The system was connected to the grid on May 27th and, as of today, it has produced 5,000 kWh. So we are feeling pretty good about meeting our 8,000 kWh annual use of electricity” says Dan.

*Electric cooperative associations argue that a distributed generation producer like Dan and Margaret’s CSA use the grid so should not be credited more than the wholesale cost of electricity for any overproduction. However, those who have studied this issue argue that the electricity produced by these systems is worth more, in some cases, than the retail price for a variety of reasons: 1) the property owner has made the capital investment in the system; 2) when demand is at its peak solar is usually producing at its best, so peak loads are leveled off; and 3) all the risk of the system is on the owner – the utility and other members have no risk involved. It is a point of contention between PV solar owners and many utilities which has heated up over the last couple of years with more and more people investing in systems. As the battery storage technology improves, some PV owners may find an off-grid system makes sense.*

Dan recommended that “anyone considering a system work with an installer who will analyze your entire operation so that you can know all of your options and be able to optimize production.” The CSA is grid-tied to Polk-Burnett Electric Cooperative (PBEC). PBEC is not a Focus on Energy member so the incentives are not as good as they are with Xcel Energy. Dan explained that he would have qualified for a \$2,400 grant through FOE but was only able to qualify for \$1,500 through PBEC. (Your utility must be a member of Focus on Energy in order to qualify for their grants.) “This may not seem like a lot of money to some but for us, it was

pretty significant. We are a pretty small operator and our business is seasonal” said Dan. PBEC’s policy is to reimburse \$500/kW up to a maximum of \$1,500. There also were some unexpected costs for the CSA.



They learned their township had invoked a \$318.00 inspection fee, “I assume because this is new to them and they are not yet familiar with the technology,” said Dan. He also was struggling with an insurance industry that also is not familiar with PV solar. “If you want to qualify for a USDA REAP grant, then you have to have insurance, which looks like it may be as much as 1.5% of the cost of the system” said Dan. Others in the group encouraged him to talk to other companies as there are insurers who do understand PV solar and are not as concerned with the risks.

The total cost of the CSA’s system was \$29,800. The REAP grant will cover 25% of the farm’s portion of electrical use, or about \$4,800. A friend who shares their values in sustainable agriculture and renewable energy assisted with about 50% of the cost so they were able to make the investment. Dan tries to use as much of the electricity his panels produce because “it doesn’t make economic good sense to sell my excess back to the grid because I only get about \$0.04/kWh, when I am paying about \$0.12/kWh.” Schmid explained that any electricity produced that the CSA does not use will then go into the grid and travel to the next customer on the line. That customer will pay \$0.12/kWh for the power that PBEC is paying the CSA \$0.04/kWh, “just a short distance down the line. “ So it makes more sense for me to put as much of that electricity to use right here on the farm” said Dan.

Dan is very proud of his Allis Chalmers G tractor, a 1940’s tractor “that you cannot get parts for any longer so a guy in New York figured out how to convert it to a rechargeable electric. It’s a perfect little tractor for our CSA. I can get about 1.5 hours of full load work out of it on a charge. You can now buy kits to convert any of these tractors to rechargeable electric,” says Dan. Dan and Margaret are now looking into other ways they can use their excess electricity, “like maybe an electric car, if we can swing it financially,” says Dan.

These three families have more than a few things in common, but primarily they have strong values of environmental stewardship and are all successful business owners. They know the value of a dollar and are very careful to invest their family resources wisely.

The state of Wisconsin has not embraced clean energy as a viable economic development opportunity, even though it is proving to be very viable in job creation, building economies, and saving consumers dollars on their energy bills. We only need to look to our neighboring states of Minnesota and Iowa to see how wind and solar energy have been fueling their economies. Investor-owned utilities in Wisconsin, however, have successfully petitioned the state Public Service Commission to authorize higher fixed charges on residential electric customers, a policy that discourages energy conservation and

renewable energy investments. According to the Midwest Renewable Energy Association, the majority of residential customers will experience increases in their electricity bills because of these new policies, which will have the largest negative impacts on “low-energy-use-households.” Because Wisconsin has no fossil fuels (coal, gas, and oil) within the state, those fuels must be imported to satisfy the need for more electricity. According to Sierra Club, Wisconsin could avoid sending about \$12 billion/year out of state in order to import fossil fuels by encouraging the development of renewable energy. Sierra Club notes that the cost of solar panels has decreased from \$76.67/watt in 1977 to just \$0.74/watt in 2012, while at the same time the technology has become more efficient. That is what these three families, and those who have invested in solar that they have learned from, know to be true. It makes good economic sense that a state would encourage economic development of its own in-state resources, like wind and solar, so why is that not happening in Wisconsin?

*Carol Johnson and her husband Jim own a 14 kW PV solar system in St. Croix County. She is a guest writer of the Hay River Review on clean energy issues. For information on any of the references in this story, contact Carol at [caroljohnson@cltcomm.net](mailto:caroljohnson@cltcomm.net)*

Part of the answer to that question can be found in a recent report issued by Environment America and Frontier Group. Titled “Blocking the Sun: 12 Utilities and Fossil Fuel Interests That Are Undermining American Solar Power,” the two groups conclude that “a national network of utility interest groups and fossil fuel industry-funded think tanks is providing funding, model legislation and political cover for anti-solar campaigns across the country.” Many of these same groups support political campaigns for candidates, who, if elected, will advance the interests of the fossil fuel industry, even if the majority of the country supports a clean energy future.

Jerry Viebrock hopes to be able to use the Northwest Wisconsin Renewable Energy Learning Center as a tool to educate people on the facts that show Wisconsin has a very bright future in economic development opportunities in renewable energy technologies.