

Berea, Kentucky



Photo: Boone Tavern, Berea, Kentucky

Berea

CASE STUDY

SOLAR
OUTREACH



PARTNERSHIP

Berea, Kentucky

The city of Berea is in Madison County, Kentucky, one of four states that designate themselves as a commonwealth. The city covers 16.1 square miles and has a population of 14,374 (2013 Census estimate). The budget for 2014 – 15 is \$7,200,000.¹ The city operates under a mayor-city council form of government, with an eight-person council. The council and the mayor hold legislative and executive powers, while a city administrator, who is appointed by a majority vote of the city council, is the chief administrative officer and exercises the executive powers and functions delegated by ordinance and statute.²

The town is known regionally as a welcoming place for visual artists and craftsmen and for its numerous festivals, historic buildings, and restaurants. Most people also know it as the home of Berea College, a private, liberal arts institution.

In a state that is third in the nation for coal production and where more than 90 percent of the electricity consumed is generated by coal-fired power plants, Berea is breaking new ground for solar energy. In 2011, Berea Municipal Utilities (BMU) installed the first of four phases of a community solar farm on city-owned land. Surrounded by coal country and accustomed to an ample supply of low-cost energy, the city has worked hard and partnered smartly to become the home of such a progressive renewable energy project.³



Berea Community Solar Farm



Berea City Hall

The City Acquires a Utility

The [Berea College](#) campus is located in the heart of the city. Its history and relationship to the city shed light on how the solar farm came to be. Founded in 1855 by abolitionist John Gregg Fee, Berea was the first coeducational and racially integrated college in the South. It also served as the town's water and electric utility until 2004. At that point, the college, which provides students with a tuition-free, four-year education, felt that its resources should be more directly focused on its educational mission and that the interests of the larger community would be better served by an independent utility. After a strategic planning session, the water and electric utility was sold to the City of Berea for approximately \$18 million.⁴

When managed and owned by Berea College, the utility operated as an investor-owned utility. In Kentucky, the Public Service Commission (PSC) requires investor-owned utilities and rural electric cooperatives to allow customers to interconnect through a net metering arrangement. When the city took over the utility, all existing tariffs and provisions were voluntarily transferred from the college, which effectively made BMU the *first* municipal utility in the state to allow net metering. As a municipal utility, BMU is not regulated

by the PSC, but it adopted many PSC guidelines after the purchase, such as the 1 percent annual peak-load cap on net metering systems. This arrangement is notable because net metering is often viewed as an important step in creating a positive environment for solar.

With the purchase of the utility came an inevitable learning curve. City leaders hired a consultant to advise them, and through an executive order, Mayor Steve Connelly established the [Berea Utility Advisory Board](#) (BUAB). An appointed five-member community board, BUAB was directed “to examine, evaluate, and comment upon policy issues . . . that pertain to utility service and operation. . . . [and] to focus its attention on developing broad policy recommendations.”

One of BUAB’s original members was Steve Boyce, a retired math professor from Berea College. Boyce was the first chair of BUAB and a member of the Madison County chapter of [Kentuckians for the Commonwealth](#), a community advocacy group. Among the many issues that group had been investigating was how to incorporate solar into Berea’s energy mix. While researching solar farms in the United States, the group became aware of [United Power](#), a cooperative utility serving northern Colorado, which had commissioned the nation’s first cooperative solar farm. That model included leasing solar panels for a twenty-five-year period and crediting lessees with the power generated by their panels. Boyce wondered if Berea could create a similar program, and he shared the idea with the other members of the board as well as city officials.

The Solar Farm Gets Seed Money

The solar farm idea generated a lot of positive interest in the community and found support from Donald Blackburn, the manager at BMU. But money was needed to make it a reality. Kentuckians for the Commonwealth kept Boyce and members of BUAB informed about grants that might help make the project possible, such as an [Energy Efficiency and Conservation Block Grant](#) offered by Kentucky’s [Department of Local Governments](#). Because of its smaller population, Berea was required to go through a competitive process to secure funds for energy efficiency improvements and renewable energy on municipal facilities. In 2009, BUAB applied for funding that would cover a municipal solar farm, energy efficiency lighting throughout the municipal utility facilities, and training for BMU staff. About eighteen months after submitting the application, Berea received an award for \$125,000. BMU contracted with [Mountain Association for Community Economic Development](#) (MACED),



Berea Community Solar Farm

a local organization that seeks to make the region more sustainable, to help put together a request for bid documents and design work for the array.

In 2011, the solar farm went into operation. The first phase was a modest 14.1 kilowatt (kW) array consisting of sixty panels available for lease by BMU customers for a one-time fee of \$750 per panel. In return, lessees would receive credit for the electricity generated by their leased panels every billing period for twenty-five years. People not living in the service area could also lease panels, and their credits could be donated to either a specified customer within the service area or a church or nonprofit. The array generated so much interest and support that all sixty original panels were leased in four-and-a-half days. In response, the city immediately doubled the size of the array, going from 14 kW to 30 kW and 120 panels. The additional panels were all leased within four months.

Ed Fortner, current director of BMU said, “The initial interest was pretty amazing. There was practically a line out the door. So it spurred us to go ahead with Phase Two, which was to double the original footprint. We did so using mostly the balance of the grant money, but also used some city funds. We were confident that we would quickly get those [new panels] leased and recoup the capital investment.”

Flush with the success of the early phases of the solar farm, Boyce and Josh Bills, the energy efficient enterprises coordinator at MACED, began lobbying the city to expand the farm again. As the solar farm proved to be a viable model, expansion would fit within the goals of the new [Energy Cost-Savings Plan](#), which was adopted in September 2012. Bills was one of several people who worked on that plan. The overall goal of [the plan](#) is to reduce energy usage

among households, businesses, and other institutions in Berea by 30 percent by 2042. It establishes baselines to measure progress and offers recommendations on no-cost, low-cost, and investment-grade opportunities. By adhering to the plan, the city believes it will save money, improve public health through decreased air pollution, and improve fiscal conditions through economic attractiveness and the creation of green jobs.

In late spring of 2014, BMU and the community decided to use city funds to move forward with Phases Three and Four, adding another 30 kW to the municipal solar farm for a total of 60 kW and 246 panels. Largely because of the drop in the price of solar panels, hard costs for these two phases were less than those for the first two phases. As of November 2014, about 90 panels remained available for lease.



Berea Municipal Utilities

Berea College was one of the first customers to lease panels. In the first phase, it leased two panels, one credited to the president's house and the second credited to the facilities management building. When the city expanded the farm to include the third and fourth phase, the college leased two additional panels. Those panels are credited to the Hager House, which is the Admissions Department, and to Napp Hall, which is the Education Department.

Why the Solar Farm Worked

The solar farm has been successful for several reasons. Operating as a municipal utility is a significant benefit. Had it been classified as a co-op utility or an investor-owned utility, the farm would have

required approval by the PSC, which, Boyce said, might have made things more difficult: "The Public Service Commission is extraordinarily conservative. They are required by law to only say yes to changes of any kind that represent the choice of 'least-cost' way of proceeding. Least cost is often interpreted in terms of what it costs people right now, without taking into consideration any of the externalities, or projecting 10 – 15 years down the road." Boyce was concerned that a twenty-five-year return on investment for customers who lease the panels may not have been viewed as a least-cost alternative when compared to the wholesale rate the utility was currently paying for power.

Josh Bills of MACED helped put the solar farm into perspective. The 60 kW generated by the farm is 60 kW that the utility doesn't have to purchase on the wholesale market. Additionally, the farm is producing at peak demand times, which helps to offset higher wholesale costs. Customer lease fees, after the initial grant funds were used, helped to finance each new phase of expansion. Also, the utility's average customer is not charged a premium to have solar as part of the city's energy mix. The kilowatt hours generated by the solar farm are credited to those BMU customers, or their assignees, who pay to lease the panels. Each month, leasing customers are assigned a net metering value for their panels based on generation produced; this value most often amounts to a \$2 – \$5 refund each month as a line item on their bills.

According to Josh Bills, "What is interesting is that this program allows BMU to impact its wholesale bill. The utility is not just buying this bucket of energy and selling that bucket of energy to generate profit. It is all related to peak demand. The solar farm isn't just offsetting kilowatt hour sales; it's also helping the wholesale cost, because in the summer months—for at least five months—it's generating when that monthly peak charge happens. That *monthly peak charge* is just whatever the maximum rate of electricity is pulled from the wholesale provider. It amounts to about 40 percent of our annual wholesale cost of electricity. So the savings in that demand charge for five months is almost exactly what the lost revenue is for the kilowatt hour sales that aren't sold to those customers that are leasing. So in other words, it's a wash for the utility. It's not an added expense, it's not a revenue source; it's a way to allow customers to invest in solar and get that benefit for twenty-five years."

This was an important point to make clear when Berea was considering the use of city funds for the Phase Three and Four expansions of the solar farm.



Sign at Berea Community Solar Farm

Bills believes that the solar farm puts BMU in an advantageous position. The utility holds the solar renewable energy credits from the solar farm, which will increase in value if the state of Kentucky decides to pass a [Renewable Portfolio Standard](#).

Berea's leaders and citizens understand that there is not a huge financial payback from the solar farm. What is equally important, however, is the statement the farm makes about choosing sustainable energy and how BMU can be a model for others. Kentucky Utilities, an investor-owned utility and BMU's wholesale power provider, approached BMU as a model for how it can add renewables to its mix. Blue Grass Energy has also reached out to BMU.

The city of Berea is proud of what it has accomplished and the recognition it has received. It has won several awards, such as "Leaders in Advancing Clean Energy in Kentucky" at the Kentucky Sustainable Energy Alliance Summit in 2012 and an Earth Day Award from the Kentucky Environmental Quality Commission in 2013.

Challenges and Limitations

The Berea solar farm demonstrates how solar can help provide clean energy. But the city's success has not come without challenges rooted in state and local policy.

For example, the state net metering statute, which BMU adopted, stipulates that once an electric provider gets to 1 percent of its annual peak load, it has a right to approach the PSC and request to not have any more net metered systems on its service. It is estimated that, as of 2014, the city of Berea is at about 75 percent of that capacity, which does not leave much room

to grow. Whether Kentucky Utilities allows BMU to expand its solar capacity to reach 1 megawatt (MW) of generation or more is still unknown, but the prospect has little legislative support.

Diana Zekind, BUAB member and Central Plant HVAC team leader and coordinator of Campus Energy Projects at Berea College, spoke about the size limitations on solar arrays. "On the campus of Berea College we have a 15 kW array on our Stevenson Building and a 50 kW array on our new [Deep Green](#) residence hall. We also have arrays on the [Appalachian Center](#) and [environmental studies](#) building. We'd love to go bigger, but city ordinances limit the size of arrays. The city of Berea had to change its own ordinance to build the solar farm. The original ordinance was limited to 50 kW and the solar farm expansion made for a total of 60 kW."

Perhaps the biggest problem impeding the growth of solar and, particularly, the municipal solar farm is the legislative and capacity limitations placed on the municipal utility. Currently, BMU has a contract with Kentucky Utilities to provide wholesale power for the local utility. Part of that contract stipulates that BMU is not a generator, even though the solar farm generates power on a daily basis. Boyce explained, "I sat down once with Donald Blackburn and the Kentucky Utilities vice president for the municipal contracts. They knew I wanted to talk about energy efficiency and renewable energy, because there were contract problems that could arise with the seven-year contract with them. It was clear from what [Blackburn] said that they would not be inclined to make an issue out of our generation if it didn't get, say, to the stage of 1 MW."

While the city is not generating even close to 1 MW, that restriction affects planning for expansion of the

solar farm and other solar projects. As Boyce said, “An important truth about Kentucky is that while the solar resources are not as good as they are in Arizona, they’re good. They’re better than [in] New Jersey, which is one of the top states for installations in terms of watts per capita in the United States. It’s probably better than Oregon, better than Germany, better than Japan—the world leaders in installed capacity. There is enough rooftop potential here to make an enormous difference. We just need some legislative things to make it happen.”

Future of Solar in Berea

The city remains positive about solar and has explored putting it on rooftops of city buildings and on the wastewater treatment facility. The annual city budget includes a placeholder for renewables, which BMU’s Ed Fortner estimates to be around \$100,000 per year. “We are known as a green community, and we are looking to get the official designation as the first green community in Kentucky.”

Richard Olson, a professor at Berea College, said, “We believe that locally produced renewable energy is essential to the development of a resilient community. The Berea Municipal Solar Farm makes participation in solar energy affordable to almost all Bereans and is a model that communities throughout Kentucky and beyond can follow.”

Ultimately, the future of solar in Berea is in the hands of its champions and the people who believe in the philosophy of doing the right thing, which is the mission of Berea College. According to Joan Pauley, sustainability coordinator for Berea College, “Berea has that history of wanting to be first, doing the right thing. The town and the college are extraordinary in terms of how they commit to that on all levels.”



Berea College Eco Village



Berea College Eco Village

Lessons Learned

Community leaders admit that their efforts may have been a little easier because Berea is a very small town where everyone knows each other. As Boyce said, “It is easy to get in to see the mayor.” But the lesson learned from this town is anything but small.

Knowledgeable citizens can help elevate a community’s awareness. In Berea, citizens wanted an opportunity for a different energy future. A group of them had already been studying how solar could be included in the city’s energy mix before Berea bought the utility. Establishing BUAB, then, was key to the success of the solar farm and, later, the creation of and buy-in to the city’s energy plan. The local government acknowledged and encouraged citizens’ interest in solar and, leveraging their enthusiasm, was able to move forward with these initiatives.

Berea’s experience also proves that projects do not have to be huge to make an impact; in fact, sometimes small projects create enough momentum to make big projects possible. The initial phase of the Berea solar farm was less than 15 kW, but citizens were so enthused by the effort that the city increased the farm’s capacity three times. The result of this collaboration between the city and its citizens is a municipal solar farm that has received several awards and attention from other local governments. Most importantly, though, the efforts set in motion goals, priorities, and annual budgetary earmarks for renewables that will continue to improve the community.

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Endnotes

1. City of Berea, Kentucky, *Budget: Fiscal Year 2014 – 2015*, <http://bereaky.gov/wp-content/uploads/2014/07/FY15-Budget-Book.pdf>.
2. City of Berea, <http://bereaky.gov/government/mayor/>.
3. Unless otherwise noted, photos were taken by authors and information was obtained through interviews with the individuals listed under “Contacts.”
4. Berea College, “Berea College Announces the Sale of Electric and Water Utilities,” <http://www.bera.edu/media-relations/bera-college-announces-sale-of-electric-and-water-utilities-to-city-of-bera/>.

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