Solar Case Study

Green Power EMC

NRECA

A Touchstone Energy® Cooperative

1. Company Profile

Created in 2001, Green Power EMC (GPEMC) is owned by 38 of the 41 electric cooperatives in the state of Georgia, to whom GPEMC currently provides 32 megawatts of renewable electricity. These 38 cooperatives are also members of Oglethorpe Power Corporation (OPC), their generation cooperative; the remaining three cooperatives in the state have their power supply needs provided for by the Tennessee Valley Authority (TVA). GPEMC's generation portfolio consists mostly of wood-fueled biomass, landfill gas and hydropower, with about 465 kilowatts of solar. Peak load for the OPC Georgia cooperatives is about 9,000 MW.

Though cooperatives in Georgia do not have any mandates or renewable portfolio standards to meet, members of GPEMC may choose, on a subscription basis, to buy into various proposed projects. GPEMC recently announced agreements to purchase the full output of three planned projects: a 20-MW solar project and a 52-MW solar project located near Hazlehurst, Ga., both owned and operated by the Silicon Ranch Corporation, and a 131-MW solar project owned and operated by Southern Power near Butler, Ga. The outputs of these are scheduled to come online in late 2015 to late 2016, with purchase power agreements from 25 to 30 years.

2. Renewable Profile

GPEMC's most visible project to date is its Sun Power for Schools program, where it has provided 37 solar demonstration systems to schools in its members' service areas across the state. As each site averages about 1.2 kw, this program is primarily educational. To simplify installation, each system is a standard kit developed by GPEMC and its contractor, and is mounted behind the meter at each participating school. Each system comprises of four to eight photovoltaic panels, from a variety of panel and inverter manufactures, including Sharp, Suniva, Canadian Solar, SMA, Kaco and Fronius, as well as other appropriate electrical disconnects. The solar array is pole-mounted to a Power Fab pole mount, which also houses the wiring. Each kit also contains a weather station and data acquisition capabilities provided by Locus Energy. Installation and routine maintenance is performed by a solar contractor. The average installed cost of each system is about $14,000.

GPEMC currently has three producing solar purchase power agreements in place for 465 kw. It has worked with Cobb EMC in implementing the 7.5-MW Azalea Solar project power purchase agreement. Green Power EMC and its member EMCs recently announced agreements with Silicon Ranch and Southern Power for projects totaling 203 MW. In addition, GPEMC is evaluating the development and construction of several small utility-scale solar projects of approximately 1 MW each. The following is a list of GPEMC Solar PPAs:

1. 115-kw Rooker Rooftop Project (14 EMC participants)
2. 150-kw Clean Controls ground-mount project (14 EMC participants)
3. 200-kw ChemNut rooftop project (18 EMC participants)
4. 7.5-MW Azalea Solar Project (Cobb EMC contracted asset)
5. 20-MW SR Hazelhurst fixed ground-mount project (27 EMC participants)
6. 131-MW Taylor County (Warner Robbins) single-axis tracker ground-mount project (three EMC participants)
7. 52-MW South Loving (Hazelhurst) single-axis tracker ground-mount project (nine EMC participants)

3. Financing and Rate Design

The 38 members of GPEMC are eligible to participate in any power project on a subscription basis and at any level they deem appropriate, including not participating at all. As GPEMC is a cooperative, the output of any power project is sold to members at cost. Member cooperatives generally roll the cost per kwh of each project into their overall power portfolio cost. Recent research indicates the bus bar cost for utility-scale solar in Georgia is approaching 6.5 cents per kwh or less, after tax incentives.

4. Project Development

Since its inception in 2005, the objective of the Sun Power for Schools project has been education and member relations. Power production has been minimal. As such, the location of the school and the visibility of the project were of prime importance, and it was left to each participating cooperative member to determine the right location for the package system. Member cooperatives do the legwork at the local level by contacting and recruiting appropriate host schools, while GPEMC provides the equipment and arranges for installation and system monitoring. There have been no permitting or licensing issues. Working with a recognized educational resource, the University of West Georgia, GPEMC developed an off-the-shelf curriculum for middle and high schools. The curriculum uses real-time and historic data from solar power generated from school installations. The program also supports teaching requirements for science, technology, engineering and mathematics. Course offerings in the areas of physical science, physics, chemistry and mathematics have been developed and put into use at partnering schools. By providing a current technology in a real-world setting in their communities, this program has won the cooperative praise from parents, students, teachers and school boards.

For purchased power projects, GPEMC focused on matching members' renewable energy needs with availability of solar production at a competitive price. The recent purchase power agreements with Silicon Ranch Corporation meet those needs. As such, Silicon Ranch is responsible for the entire engineering, procurement and construction process, as well as ongoing operations and maintenance. The only requirement set forth by GPEMC was that the facility needed to be located in the state of Georgia.

In addition, small utility-scale solar projects (250 kw to 2 MW) will likely be developed with member cooperative ownership in mind. These projects will be located in participating EMCs' respective service areas to provide maximum visual exposure to end-use customers. The EMCs will determine a suitable location for the project and will work closely with GPEMC to finance, construct and operate the facilities.

5. Operations and Maintenance

With the Sun Power for Schools project, a third party provides maintenance on a contractual basis; with the exception of maintaining the data acquisition components, very little maintenance has been required.

Under the power purchase contracts with third parties for the larger solar installations currently under development, GPEMC has no responsibility for operations, maintenance or interconnection issues.

Plans for the smaller utility-scale projects (1-MW each) include a collaborative operation and maintenance plan to be conducted by Green Power EMC and the staff of participating EMCs.

6. Telemetry

The Sun Power for Schools program uses the Locus Energy solar monitoring system. This data acquisition system transmits data to a central server from each school's solar installation using the school's local Internet service.

Green Power EMC is evaluating Locus Energy as well as other data acquisition and monitoring systems for use in the new utility-scale systems currently under development.

7. Administrative Impacts

GPEMC has a management services contract with OPC that provides management and administrative support on a fee basis. During the development of the Sun Power for Schools program, and more recently with the negotiations of the purchase power agreements, OPC provided the equivalent of about two full-time employees. When legislative needs arise, GPEMC works with OPC, Georgia EMC and local cooperatives to help address issues regarding renewable energy. For example, a recent Georgia law allows third-party solar energy sales. This state legislative effort was a combined effort of multiple stakeholders, including the EMC organizations listed above, as well as the investor-owned utility, municipal utilities and interested parties from the solar industry.

GPEMC has developed a statewide cooperative training program for renewable energy for the benefit of the entire state.

8. Renewable Policy Development

Although cooperatives in Georgia are not regulated by the Public Service Commission and are not required to meet a renewable portfolio standard, they believe it prudent to voluntarily increase the amount of renewable generation—solar in particular—in their power portfolio mix. To that end, they develop or purchase renewable generation. They are increasing the local presence and visibility of renewables to educate their members, and are exploring ways to give those members options to engage directly in renewables, through either a virtual rooftop option or participation in a community solar array.

9. Lessons Learned

Frequent and effective communication with cooperatives and their staffs is the main lesson learned. EMC staff awareness of renewable energy issues is critical to helping a cooperative maintain its mission as the energy leader in its service territory. As the price of renewables, especially solar, continues to fall and those of traditional generation resources continue to rise, member interest in renewables will increase. Green Power EMC has been successful in keeping the cooperatives of Georgia working together and leveraging their collective strengths to meet the challenges and opportunities of renewable energy. GPEMC is working on instituting a four-part strategy with its members to prepare them for the future:

1. Offer retail rates—Better current volumetric-based retail rate structures with the fixed-cost nature of the utility business.
2. Build and/or buy solar—Participate, get hands-on experience and show leadership and credibility with an emerging energy technology.
3. Become your community's local solar expert by educating yourself, your staff and your membership—Become the go-to solar experts that your members think of first when considering solar technology.
4. Offer opportunities for the cooperative membership to engage and participate in EMC/cooperative-sponsored solar energy projects and service.

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