

COVER PAGE

Recipient Organization: Forest County Potawatomi Community

Project Title: Deployment of Community Scale Solar Photovoltaic Energy Systems in Forest County Potawatomi Community

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- 2. Executive Summary:** FCPC is a federally recognized tribe with a membership of more than 1400. The Tribe has a reservation in Forest County, Wisconsin, and tribal trust lands in Milwaukee County, Wisconsin, with significant governmental and business operations in both areas. Until relatively recently, FCPC was one of the poorest tribes in the Midwest. Due to its successful gaming operations, it now has improved its financial situation and is using its resources to benefit both its members and the general public through environmental and other community efforts, many of which are long-delayed because of the extended period of abject poverty.

The Tribe has developed the long-term goal of becoming energy independent using renewable resources. In order to meet this goal, the Tribe has taken several important steps. As an interim step, FCPC is purchasing nearly 55 million kilowatt hours of renewable energy certificates ("RECs") annually from certified renewable energy facilities in the United States. These RECs offset more than 100% of the present electricity use at all of the Tribe's facilities. The Tribe is currently ranked number 11 on the Environmental Protection Agency's (EPA) Top 20 Local Government list of green power purchasers and is a member of the EPA's Green Power Partnership.

The Tribe also recognizes that improving energy efficiency is critical to reaching its long-term energy independence goal. Because of this the Tribe has implemented numerous energy efficiency measures at its facilities, and it conducts quarterly energy audits to track its energy usage. Since 2007, the Tribe has reduced their energy usage per gross square foot by 13.6 percent and reduced their corresponding carbon emissions by almost 20.6 percent. These efficiencies have eliminated more than 13,700 tons of emitted carbon dioxide per year. That is the equivalent of the annual greenhouse gas emissions from almost 2,500 passenger vehicles, or the CO₂ emissions from the electricity use of roughly 1,550 homes for one year. In 2010 and in partnership with DOE, the Tribe completed an upgrade of the lighting in the parking facility at Potawatomi Bingo Casino in Milwaukee, WI. The lighting upgrade reduced the parking facility's annual electricity use by approximately 73% and avoids approximately 1,912 tons in CO₂ emissions per year. The project went through revision after initial design and application to DOE.

Although the Tribe intended to use the grant to provide solar for tribal member housing it was determined that the challenges of that approach significantly limited project viability. Specifically, installation of tribally owned solar on homes owned by members would require additional layers of contracting, insurance, and other practical matters which resulted in challenges. Furthermore, project redesign resulted in a much greater amount of solar kW being installed providing financial benefit to the Tribe.

The original project suggested small scale installations on tribal homes and certain government buildings. The Tribe suggested that the project would result in 730 kw installed. By revising the project, the Tribe was able to install 938 kw and owns the largest installation in Northern Wisconsin with the 800 kW installation at the Potawatomi Carter Casino Hotel("PCCH"). The PCCH installation, in summer months, can provide near 90% of the use during daylight hours. Although tracking was not immediately available FCPC has since confirmed significant production with certain quarterly savings nearing \$210,000.

These installations provide a reduction in facility costs providing more revenue for Tribal services including cultural, health, sustainable food sources, environmental preservation and other Tribal initiatives. Further, the installations have resulted in positive steps towards the Tribe's goals of energy sovereignty and the use of 100% renewable clean energy. Finally, the PCCH project, specifically, has had the additional benefit of providing a likely area for a microgrid. The size of the installation and offset achieved have pushed the Tribe toward planning for storage and a microgrid system that would both further the Tribe's energy goals and provide a safe haven for the Community during times of need.

3. **Project Objectives:** The project objectives were to 1.) Increase the Tribe's energy independence by increasing capacity to generate clean, renewable power in an economically feasible manner; 2.) provide a continued model for others in Indian country; and, 3.) to allow for continued development of tribal energy through the integration of projects on tribal facilities.

4. **Description of Activities Performed:**

Activity #1: DOE Negotiations

FCPC was notified in June of its selection for the grant. It worked with DOE to revise its SOPO and provide supplemental information. The grant award, revisions and supplemental information were finalized in July, 2017.

Activity #2: Bid Out and Hire a Solar Investor/Contractor

FCPC circulated an RFP in September, 2017. The Tribe sent the RFP to 8 interested contractors. A response deadline of October 31, 2017 was included and a mandatory pre-bid meeting was held on October 18 on the FCPC Reservation.

The RFP explained the preferred approach to the project including the creation of an LLC and the contribution of investment capital by the contractor along with the DOE grant funds. Although several calls were fielded requesting more information, there was only one response to the RFP by SunVest Solar, Inc.

The Tribe negotiated specific terms with SunVest, including an increase in the originally proposed installation size and entered a letter of intent to provide certainty while final negotiations occurred. In light of the Tribe's previous experience and its desire to fast-track this project the Tribe is negotiating for more project certainty. The specific buildings, installation sizes and timelines will be contractually obligated in order to ensure pricing and outcomes.

FCPC and SunVest held several meetings both on reservation and at the Tribe's Legal Department to finalize details. The Tribe's Executive Council passed motions approving the installation of systems at the Tribe's Health and Wellness Center, Carter Casino and Executive Building. All of the installations will be on government buildings on the Tribe's reservation in Forest County, WI.

The Tribe and SunVest mutually agreed to a Letter of Intent in January, 2018. The purpose of the letter of intent was to allow the parties to negotiate final project details in good faith although a final contract was not in place. SunVest and the Tribe wanted certain guarantees that the parties intended to move forward; on SunVest's side, it was using significant time and resources to design the project and the Tribe wanted certainty of an installed amount and transparency with the financial arrangements, costs and schedule.

Although initially intended to be an Investment Tax Credit LLC arrangement, the regulatory environment in Wisconsin changed between grant proposal and contract arrangements. Due to a Wisconsin legal case involving a municipal government the ITC arrangement is in limbo until the Wisconsin courts decide whether the arrangement effectively creates a utility. Thus, the contract and subsequent project was run as a design build.

SunVest finalized designs for Executive Council Approval. The Tribe planned for installations of 56 kW at the Executive building, 82 kW at the Health and Wellness Center and 800 kW at the Carter Casino for a total of 938 kW.

Activity #3: Finalize Installation Site Selections and Tribal Approval

The Executive Council approved the initial site selections. The project team received final schematics for each site and finalized the details specific to each site such as grading and tree removal. FCPC and SunVest held two meetings at the PCCH site one on July 19 and the other on August 7, 2018. These meetings assisted the PCCH staff for planning purposes, worked through interconnection issues with WPS and helped provide significant planning and scheduling for the project. PCCH had several concerns related to site location after site approval due to future growth. Executive Council, Legal, NRD and PCCH evaluated the site and options in light of final design approval and ensured that concerns were discussed, although plans were not altered. FCPC and SunVest also interfaced with WPS, the local publicly owned utility, to ensure proper system performance. Like many tribal reservations, FCPC's is in an area that has older utility equipment. PCCH, one of the larger users in the area requires a significant daily load and the utility was concerned with providing consistent supply without peaks and valleys in its distribution system. Specifically, the utility was concerned with the panels coming into service at one moment eliminating the need for power in an abrupt fashion. The site required additional engineering based on these conversations with the utility.

Activity #4: Final System Design

The site locations were approved and SunVest and FCPC completed site schematics in August. System design was reviewed based on concerns from the local utility. As noted above, WPS was concerned with distribution performance. PS does not have another 800 kW project within its service territory and was concerned with fluctuations when the solar came on line or went off. SunVest redesigned the system to have a phased start up to

alleviate WPS concerns. System design was also slightly altered by WPS request for a change in interconnection infrastructure. The system was redesigned to provide WPS easy accessibility to an interconnection point.

Activity #5: Bid Out & Hire Subcontractors

SunVest provided a list of subcontractors which FCPC approved and incorporated into the AIA contract for construction. Subcontractors were hired and managed through SunVest after FCPC approval.

Activity #6: Power Purchase Agreement with WPS-

Power purchase agreements for each site were drafted and signed by FCPC. They were provided to WPS in August, 2018.

Activity #7: Interconnection Application-

Interconnection applications were finalized and submitted to WPS in 2018.

Activity #8: Structural Review

Structural Review was performed along with System Design. The Tribe wanted to ensure that limited changes need to be made to the site selections and specific installations after Executive Council approvals so requested engineering opinions of the suitability for the Executive Building and Health and Wellness Center. The structural review was performed by the Tribe and SunVest. Certain concerns were raised regarding the Health and Wellness Center and the Tribe had a slight delay awaiting additional information to ensure project feasibility. FCPC had additional review of the Health and Wellness Roof and needed to wait for the manufacturer's sign off prior to installation. The approval from the manufacturer required a 30 day waiting period and the Tribe received that in October of 2018. In addition to the engineering opinions, the Tribe required internal departments to sign off on the suitability of the locations and ensure that no damage would be incurred. All review was completed and final approvals were granted by FCPC Executive Council.

Activity #9: Environmental/Cultural Review and Permitting

FCPC NRD provided written review and approved all sites for construction.

Activity #10: Order/Secure Materials-

SunVest Solar ordered site materials and supplies independent of the Tribe.

Activity #11: Site Preparation-

Tree removal and site preparation was performed for PCCH. Health and Wellness required an additional approval from the roof manufacturer and that was received. Executive Building required no active preparation for roof installations.

Activity #12: Install Racking-

Racking installation occurred without issue with the exception of PCCH. The geology of the site, several large boulders and a shallow rockbed, required some plan improvisation. Engineering was completed in July and August 2018 and racking was finalized in September.

Activity #13: Install Solar PV Modules-
Solar PV modules were installed upon the racking without issue.

Activity #14: Install Inverters-
Inverters were installed and connected to the modules. WPS was on site for the PCCH installation due to the size and complexity.

Activity #15: Connect Inverters to Electric Distribution System-
The inverters were connected in early January, 2019.

Activity #16: Test/Inspect/Commission-
Testing, inspection and commissioning occurred in early January, just after the close of the quarter.

Activity #17: Verification of Energy Use Reduction
Tracking was initially verified for several quarters for the H&W and Executive Building sites. The use verification for PCCH was slightly frustrated with a lightning strike that damaged the installation. Repair of that took several months. Although verification could be inferred by comparing previous utility bills in similar quarters accurate reporting was not available until 2020.

5. Conclusions and Recommendations:

The Tribe has taken an important step to reaching its goals of energy sovereignty through the use of self-supplied green energy. The addition of nearly a MW provided nearly a 90% offset of energy at one of the three sites during day time use and has helped the Tribe focus on remaining distributive generation projects for new buildings. The Tribe has also begun to consider options such as storage and microgrids to integrate new projects that will further the Tribe's initiatives and ensure continued steps towards sovereignty.

Although FCPC has planned and implemented several of these projects it learns new approaches and lessons in each project. In this project, flexibility was key to implementation and the resultant outcomes. Additionally, planning is important not only at initial stages but also at subsequent stages when there may be unanticipated changes or challenges. Finally, support of Executive Council and the tribal community is essential to success. Consistent information is key to project implementation and success.

Site	Q1	Q2	Q3	Q4	Q5	Q6	Total
Health and Wellness	4,836.29	29,893.92	29,886.43	7,293.61	32,030	15,530	119,470.25
Executive Building	3,554.84	16,988.83	20,043.36	5,020.58	21,720	30,800	98,127.61
Potawatomi Carter Casino Hotel	N/A	N/A	N/A	69,888.04	N/A	293,630	363,518.04

6. Lessons Learned:

The FCPC project initially faced some challenges with design due to unforeseen complications associated with tribal housing and construction delays with other planned tribal buildings. Although the initial plan was to install small projects at approximately 60 sites, it was determined that the challenges with tribal housing and the delay in construction of other facilities necessitated a change in scope and approach. The Tribe was able to overcome those challenges by identifying new project sites and was able to increase the kilowatts installed to provide greater energy offsets and a reduced simple payback period.

The other challenge the Tribe faced was with the changing policy objectives of local utilities. Due to the uncertainty of the use of the ITC relationship, investors had a lower appetite for the arrangement which meant a higher capital cost for the Tribe. However, with those challenges the Tribe was still able to significantly increase its installed solar moving the Tribe closer to its goals of energy sovereignty and production of clean, sustainable energy. The project afforded the Tribe more understanding of project sizing, issue spotting and planning and resulted in the design of a third project, currently underway.