Solar Case Study

Cherryland Electric Cooperative

NRECA

A Touchstone Energy® Cooperative

1. Company Profile

Cherryland Electric Cooperative serves approximately 33,000 members in six counties in northwestern Michigan around the Traverse City area, about a four-hour drive north from Detroit. Cherryland is an all-requirements member of Wolverine Power Supply Cooperative (Wolverine), its G&T. As such, its power supply is about 57 percent coal, 13 percent natural gas, 23 percent nuclear and 5.6 percent renewables, with the remainder coming from other sources.

Its membership makeup is about 95 percent residential and 5 percent commercial and industrial (C&I). The system density is about 11 members per mile, and the system is summer-peaking. The terrain is hilly and heavily treed, with ample water resources for farming and recreation. Given its location and proximity to Lake Michigan, the system is subject to heavy winter snowfalls. Recreational and summer homes abound; Cherryland's largest single member is the Crystal Mountain ski resort.

2. Renewable Profile

Michigan has a renewable portfolio standard (RPS) of 10 percent renewable generation by 2015. Wolverine is capacity-short at present and has a new natural gas-fired peaking power plant under development. Wolverine has created a subsidiary, Spartan Renewable Energy (Spartan), to develop renewable energy projects on behalf of its members. Spartan is the owner of a 52-kilowatt DC Cherryland array called the SUN Alliance, which is short for Solar Up North. The SUN Alliance array consists of 224 235-watt DC Sonali-branded solar panels. The panels, mounted on AETR 24 and AETR 36 ground-mount racks, use 14 RENOVO inverters. Although some components were imported, final assembly of the modules was completed in Michigan. The racks and inverters were also engineered and developed in Michigan. The array encompasses an area of about 240 feet by 240 feet (approximately one acre), and is located at the Cherryland's headquarters in Grawn, Mich. Project development started in October 2012, construction started in December 2012 and the project entered service on April 21, 2013. Given its northern location, the disparity in power production between high and low months is revealing. The power produced in August, its highest production month, was worth about $2.75 per panel, based on the current retail rate. In January, its lowest month, the power was worth about 27 cents! Examples of monthly production for August and January are on page 32.

The array fits into Wolverine's overall power supply portfolio because of the RPS mentioned above. Another consideration leading to development of the community solar array was the significant presence of green energy advocates in Cherryland's territory.

3. Finance and Rate Design

Because of its wholesale power supply contract and working relationship with Wolverine, Cherryland developed the project through Wolverine's for-profit subsidiary, Spartan, to utilize available tax credits and lower the overall net cost. No other models were considered. Spartan owns the array and leases it back to Cherryland. At the end of a six-year period, Cherryland has the right to purchase the project at a set residual amount, similar to a tax equity flip structure.

In addition to the lease payment, Cherryland is responsible for all costs associated with the array—operation, maintenance, taxes, insurance, etc. Members can participate by purchasing a share of the array at $470 per share, which amounts to about 223 watts AC. Because of a Michigan energy conservation mandate, Cherryland is required to spend the amount necessary in energy conservation measures or rebates to reduce consumption by 1 percent of last year's sales. Solar qualifies, so members who purchase a panel also received a $75 rebate, lowering the net cost per panel to $395. Members do not own a specific panel, but rather a 1/224 interest in the output of the array. Members receive a credit on their bill based on their percentage of array output own-

ership in a particular month on a per-kilowatt-hour basis. The kilowatt hours to be credited are valued based on the wholesale cost of power (currently 8.3 cents per kilowatt hour) to the cooperative for that particular year. This arrangement continues for 25 years. In a somewhat unique arrangement, based on Cherryland's long working history with its local municipal utility, Traverse City Light and Power (TCLP), customers of the municipal utility may also participate in the array on the same basis as members of the cooperative. This is accomplished by crediting the municipal utility for the kilowatt hours of its participating customers. TCLP then issues a credit to each of its participating customers on their municipal electric bill. Any value of renewable energy credits stays with the cooperative to offset future costs associated with the array. Consumers who move out of co-op or municipal utility territory can transfer their ownership to any other member or customer serviced by the two utilities. The solar garden investment agreement between Cherryland and individual participating members is on page 33.

Cherryland felt that because this was a community solar array, and the first in Michigan, it wanted the larger community to be able to participate. This also provided a larger market for the panels and reduced risk. The array sold out in less than 12 months, leading Cherryland to consider plans for a second array. The second array will likely be located on TCLP lines.

4. Project Development

A primary concern was to keep the project as simple as possible. It was quickly determined that Cherryland's headquarters could accommodate an array of this size. Three qualified contractors in the area were invited to respond to a request for proposals. A local vendor with a history of solar expertise, Contractors Building Supply, was selected to engineer, procure and construct the project. This vendor was selected not only because of its bid, but because of its expertise with solar. It was also a co-op member. The vendor was responsible for the turnkey operation, including commissioning, interconnection and acceptance testing.

There were no issues with the required local electrical inspection. Fencing was not required. The only zoning issue encountered was related to the size and location of signage at the array.

5. Operations and Maintenance

No special operations and maintenance procedures have been developed other than the schedule for weekly monitoring of the array's output. Inverters and panels are covered by a 25-year warranty, and few operational issues or failures have been encountered. Given that snow sometimes blankets the area, consideration was given to sweeping snow off the array to obtain maximum output. This was researched, and based on informal calculations, it was determined that the cost of removing snow from the array would not justify the increase in output.

For simplicity, the array was connected to Cherryland's office building, effectively netting a portion of the building's consumption. Given the load size of the office building, initial calculations showed no operational issues were anticipated, and none have been observed. No mitigation techniques or added technologies were required of the electric distribution system to accommodate the interconnection.

Cherryland donated two panels to the local high school robotics class to develop a method for removing snow from solar panels using robotic techniques.

6. Telemetry

No advanced technology is used to monitor or manage the array. Its output is collected weekly and posted in real time on the co-op's website. The RENOVO inverters were chosen with this in mind.

7. Administrative Impacts

No additional personnel were required; however, some extra effort was needed for marketing. One employee was designated as the go-to person for member contacts. Some effort and money were spent on legal services to develop the necessary agreements. No changes in staffing are anticipated as a result of the array. The biggest administrative task was to develop the necessary agreements and to train member contact personnel in the signup process.

8. Renewable Policy Development

In 2011, the Cherryland board voted to remove the cooperative from regulation by the Michigan Public Utilities Commission (Commission). However, Cherryland closely follows public policy set forth by the Commission. Cherryland and Wolverine are following state mandates and expect to have 23 percent of their load generated from renewable sources by 2018.

9. Member Interest in Solar

The cooperative had anecdotal evidence of member interest in solar. Management decided, with board support, to develop what they called a brick-and-mortar survey to determine member interest. If it sold out, that would be an indicator, and if it failed to sell, that would be another. In addition to the solar array, the cooperative presently has 40 net metering systems interconnected, with the majority of those being solar. Currently, 120 members and 80 TCPL customers are participating in the array, which is 100 percent sold out. Member feedback has been overwhelmingly positive.

10. Business Options

Cherryland approached the project with three principles in mind: Keep it simple, maintain control and ownership, and build visibility for the project. Third-party ownership with major national entities was rejected as too complex. Its partnership with Spartan and TCLP fit the project well from the start.

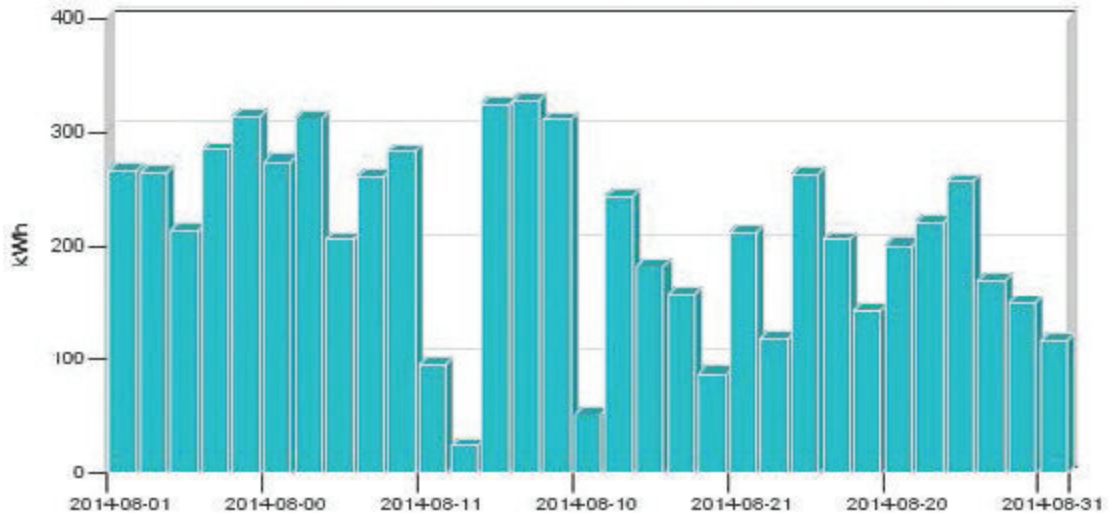
A formal cost-benefit analysis was not undertaken prior to the start of the project. An overriding goal was to keep the total cost of the project low enough that a member could buy a share for under $500 and mitigate risk. That goal was met with the $470 share price thanks to favorable financing and utilization of the tax credits available through Spartan. Lowering risk was accomplished through right-sizing the project and including the 11,000 TCPL customers as potential buyers.

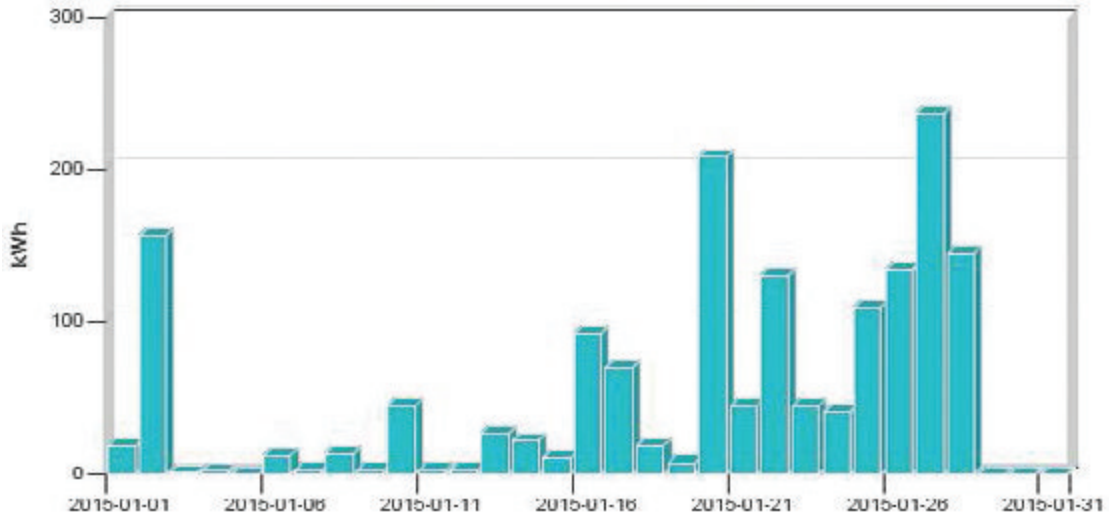
11. Lessons Learned

This project was an overwhelmingly positive experience for Cherryland. It was able to not only provide a low-cost solar resource to its members, but also successfully position itself as environmentally progressive and not just the “coal guys.” The availability of the array has provided opportunities that otherwise may not have been available to a segment of the membership that wants greener and cleaner energy. It provides the link from the energy resources of today to the resources of tomorrow, and those who want it pay for it without cross-subsidization.

The cooperative’s advice to those who are contemplating a community solar would be the Nike motto—Just Do It! There were some skeptics on Cherryland’s board, but a careful explanation of the facts brought them around.

Examples of Monthly Production—August and January





SOLAR GARDEN INVESTMENT AGREEMENT
CHERRYLAND ELECTRIC COOPERATIVE

This Solar Garden Investment Agreement ("Agreement") is made and entered into this ___ day of _____, 2013 by and between Cherryland Electric Cooperative ("Cherryland"), with its principal place of business at 5930 US 31 South, Grawn, Michigan 49637 and the Cherryland Member ("Member") identified as follows:

Member: _____
Service Address: _____
City/Twp: _____
State: _____
Telephone: _____
Member No.: _____

1. **Overview**.

1.1 Cherryland has developed the Solar Up North Alliance (also known as the "SUN Alliance") Community Solar Garden ("Solar Garden") located at 5930 US 31 South, Grawn, Michigan 49637, which is comprised of, among other things, photovoltaic solar panels (each a "Solar Panel").

1.2 Qualifying Cherryland members may purchase investment shares in the Solar Garden and receive future billing credits by paying a one-time upfront charge.

1.3 This Agreement sets forth the terms and conditions of Member's purchase of investment shares in the Solar Garden.

2. **Purchase of Solar Garden Investment Shares**.

2.1 Subject to the terms and conditions set forth in this Agreement, Cherryland hereby grants to Member credit for savings incurred by Cherryland's headquarters related to net metering the energy output from the Solar Garden in the amount set forth in the Approval Form ("Solar Garden Credit"), attached hereto as Exhibit 1 during the term of this Agreement.

2.2 Member will receive the Solar Garden Credit as a credit on the Member's monthly billing statements for service provided by Cherryland at the customer service address set forth in the Approval Form ("Service Address") in the manner provided in Section 6 below.

2.3 Member acknowledges and understands that Cherryland will retain sole ownership, possession and control of the Solar Garden and each Solar Panel and will have the exclusive right to maintain and operate such Solar Panels and the Solar Garden.

2.4 Member acknowledges and understands that Member is not purchasing electricity from the Solar Garden, and that its sole involvement is as an investor in the Solar Garden to encourage and support Cherryland's use of renewable energy at Cherryland's headquarters. Cherryland will interconnect the Solar Garden to its facility located at 5930 US 31 South, Grawn, Michigan 49637 and treat the Solar Garden as a net metering project and all energy produced by the Solar Garden will be isolated and metered at the facility in compliance with Cherryland's net metering tariffs.

3. **Consideration**. Member will pay Cherryland the amount set forth in the Approval Form as consideration for the Solar Garden Credit granted, and to be granted, to Member pursuant to this Agreement.

4. **Effective Date**. The Effective Date of this Agreement shall be the first day of the Member's billing cycle which follows the later of: (i) the interconnection date of the Solar Garden (the date the Solar Garden starts delivering energy to the Cherryland headquarters facility) or (ii) Cherryland's execution of this Agreement.

5. **Term**. This Agreement shall run from the Effective Date for a period of twenty-five (25) years or, if earlier, until the death of the Member (the "Term"), subject to early termination as provided in this Agreement.

6. **Solar Garden Credit**. The Member will receive a credit on the Member's monthly billing statement equal to the Member's proportional share of the total Solar Garden net metering savings in kilowatt hours multiplied by the existing rate applicable to the Cherryland headquarters facility.

7. **Change in Member Location**.

7.1 Member shall notify Cherryland in writing within fourteen (14) days prior to any change in Member's utility service location during the Term.

7.2 If Member moves to a new location within the service territory of Cherryland, then the account associated with the Member's new service location shall be substituted for its original account in effect when this Agreement was executed.

7.3 If Member moves to a new location outside of the service territory of Cherryland and fails to effectuate a transfer of the Solar Garden Credit to another qualifying member of Cherryland pursuant to Section 8 below, the investment shares shall revert to Cherryland and Member shall have no claim to the investment shares or future credits, and shall have no claim to a refund of the investment share price.

8. **Transfer or Assignment of Solar Garden Credit**.

8.1 Member, or Member's duly authorized representative or agent, may seek to transfer the Solar Garden Credit to another qualifying Member of Cherryland by submitting a Transfer Application. Cherryland has sole discretion as to whether to approve the Transfer Application.

8.2 If Cherryland approves the Transfer Application, the transfer shall not be completed until the Member receiving the Solar Garden Credit (transferee) executes a new Solar Garden Investment Agreement and any other necessary documents related to the transfer.

9. **Additional Acknowledgments**.

9.1 Member acknowledges that, except as expressly provided in section 8 of this Agreement, Member may not assign, gift, bequeath or otherwise transfer any Solar Garden Credit to any other individual or entity.

9.2 Member acknowledges that Member has no right, title or claim to the electric energy produced by the Solar Garden.

10. **Reporting and Marketing**. Member authorizes Cherryland to use Member's name, the amount of purchased shares and Solar Garden Credit information ("Member Information") for reporting and marketing purposes. Cherryland may use the Member Information only for official reporting to governmental authorities, public utility commissions, and similar organizations, and in marketing materials generated and distributed by Cherryland or its agent. Except as required by law and as otherwise provided in this Agreement, Cherryland will not release or otherwise publish any information collected from Member other than the Member Information. Notwithstanding this section, Cherryland will not use or disclose Member's name if Member provides written notice strictly prohibiting such use.

11. **Notice**. All notices, requests, consents, and other communications under this Agreement shall be in writing to the mailing address for each party stated above.

12. **Governing Law/Jurisdiction/Venue**. This Agreement shall be deemed to have been made in, and shall be constructed under, the laws of the State of Michigan. The parties acknowledge and agree that a court of competent jurisdiction located in Grand Traverse County, Michigan shall have exclusive jurisdiction in any action or proceeding arising under or relating to this Agreement.

13. **Entire Agreement**. This Agreement, including the Exhibit(s) attached hereto, constitutes the entire agreement between the parties with respect to the subject matter hereof and supersedes all previous proposals, both oral and written, negotiations, representations, commitments, writings and all other communications between the

parties. This Agreement may not be released, discharged, or modified except by an instrument in writing signed by a duly authorized representative of each of the parties.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first written above.

MEMBER	CHERRYLAND ELECTRIC COOPERATIVE
_____	_____
Member Name (please print)	Signature
_____	_____
Member Signature	Printed Name
_____	_____
Date	Title
	_____
	Date

For additional information, contact:

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