

Residential Energy Saving Solar Deployment Project



Chippewa Cree Tribe

Final Report for Department of Energy and Chippewa Cree
Solar Deployment Energy Savings Project.

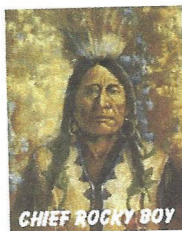
Chippewa Cree Energy
Corporation

31 Agency Square
Box Elder, MT 59521

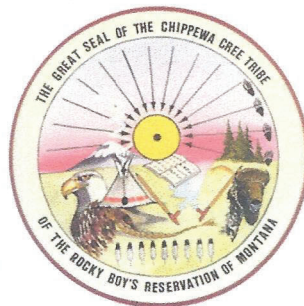
406.395.5705

Fax 406.395.5702

10/31/2018



CHIEF ROCKY BOY



CHIEF LITTLE BEAR

Project Title: Chippewa Cree Residential Solar Deployment Project

DOE Award Number: IE0000047

Award Recipient: Chippewa Cree Tribe of the Rocky Boy's Reservation

Partners: GRID Alternatives Inc.
Chippewa Cree Housing Authority
Stone Child College
Chippewa Cree Energy Corporation

Tribal Contact: Trevor Standing Rock
Chippewa Cree Energy Corporation
96 Clinic Rd.
Box Elder, MT 59521
406.395.5705

Construction Contact: Tim Willink
GRID Alternatives Inc.
1120 W. 12th Ave.
Denver, CO 80204
303.968.1633

Tribal College Contact: Jesse Colliflower
Construction Instructor
8294 Upper Box Elder Rd.
Box Elder, MT 59521
406.395.4313

Housing Authority Contact: Merle Belcourt
Maintenance Director
75 Laredo Rd.
Box Elder, MT 59521
406.395.4370

Tribal Business Contact: Melissa Stump
Chippewa Cree Finance Tech.
96 Clinic Rd.
Box Elder, MT 59521
406.395.5705

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Department of Energy
Office of Indian Energy
Chippewa Cree Residential Solar Deployment
Attn: Office of Indian Energy Policy and Programs
Submitted TO: <http://www.osti.gov/elink-2413>

Final Report Prepared BY:

[Chippewa Cree Tribe](#)
Trevor Standing Rock
31 Agency Square
Box Elder, Montana 59521
406.395.5705
tstandrock23@gmail.com

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Section 1.0 Introduction

The following is a final report for the completed residential Solar Deployment Project on the Rocky Boy's Reservation. The project was a successful partnership between the Chippewa Cree Tribe, Stone Child College, Chippewa Cree Energy Corporation, Grid Alternatives, and the Office of Indian Energy.

The purpose of this report is to define the outcomes of the project and has been divided into five aspects: project overview, objectives, description of activities performed, conclusions and recommendations, and lessons learned.

1.1 Executive Summary

The overall project goal was to install clean energy systems in order to achieve the Chippewa Cree Tribe's long-term goal of energy self-sufficiency, environmental protection, and better lives for our tribal members and community. This would be the first solar deployment project on the Rocky Boy's Reservation.

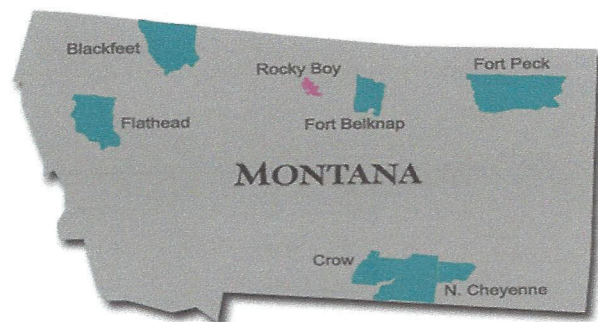
With 50% of the funding provided by the Office of Indian Energy, the Chippewa Cree Tribe teamed up with GRID Alternatives to install six grid-tied, solar electric systems for low-income single-family homes. The systems installed were estimated to provide 4,400 kWh annually with an estimated \$451 dollar savings per household. After monitoring the systems for a year, we were almost able to obtain our goal with an average of 3,971 kWh and a \$419 dollar average savings per household. We would have exceeded our goal but one of the units was without power for the majority of the year bringing down the average significantly.

Another major component to the grant was workforce development. GRID Alternatives supplied training for students from Stone Child College on the installation process. With the collaboration and planning efforts from all of the departments, the installations were completed in October of 2016.

Throughout the report you will see the six installations are diverse, and each needs to be considered in the context of the individual family structure, size, and energy consumption habits.

1.2 Rocky Boy Location, BRIEF History

The Rocky Boy's Indian Reservation is located in north central Montana, nestled within the Bear Paw Mountains and home to the Chippewa Cree Tribe (**CCT**). The **CCT** has been a federally recognized tribe by



executive order since 1916 and is a sovereign nation who continues to exercise the rights of home rule and the responsibility for the general welfare of its members.

Section 2.0 Project Overview

Tribe/Awardee

Chippewa Cree Tribe

Location

Rocky Boy, Montana

Project Title

Chippewa Cree Tribe Deployment of Clean Energy Solar PV Project

DOE Grant Number

DE-IE0000047

Project Amounts

DOE: \$63,435

Chippewa Cree Tribe: \$63,436

Total: \$126,871

Project Status

Complete

Project Period of Performance

Start: June 2016

End: May 2018

2.1 Tribal Council Resolution

Tribal Resolution No. 147-15 approving the deployment of clean energy on low-income homes.

Section 3.0 Objectives and Scope

Through the Chippewa Cree Tribe Deployment of Clean Energy Solar PV Project, the Chippewa Cree will partner with non-profit solar installer GRID Alternatives to introduce a scalable model of solar PV to its reservation. The installation of the six solar PV systems on the Rocky Boy's Indian Reservation, will help fulfill the Chippewa Cree's strategic goals of long term sustainable development of its energy resources.

3.1 Scope

Scope of Work: Solar Installation

1. Install solar photovoltaic (PV) generating systems on 6 low-income homes in the Middle Dry Fork Village on the Rocky Boy's Indian Reservation.
2. Satisfy the DOE Grant's 50% Cost-Share requirement, where GRID and the Energy Corporation will each contribute \$31,718 of the cost to install solar PV on the 6 homes and GRID-sourced philanthropy.
3. Provide workforce development opportunities through hands-on solar installation to target skill-building and job training to help tribal members gain experience in the solar industry.

Key Milestones & Deliverables

Year 1:	Install six 3.5 kW solar PV systems on three of the tribe's recently constructed duplexes.
Year 2:	Verify energy output and savings to use as justification for future renewable energy projects.

Project Outcomes

Install six 3.5 kW grid-tied residential solar PV systems—21kW total—on three of the tribe's recently built duplexes constructed from highly energy efficient SIPs panels. It is estimated the project will produce 26,541 kWh/year or 283,988 kBtus/year and offset 27.3% of the current aggregate electrical usage, from 972,272 kWh/year. 10 Job Trainees will gain up to 80 hours of hands on, real world job experience in the solar PV field.

Section 4.0 Description of Activities Performed



After several months of planning, GRID Alternatives and their team arrived on October 10th. They spent a day visiting the site and preparation activities for construction. We held an orientation with Stone Child College Students explaining how the PV system works and safety training. We were ready to install!



It was still a little chilly outside and the roof required some prep work to begin



Construction was in full swing

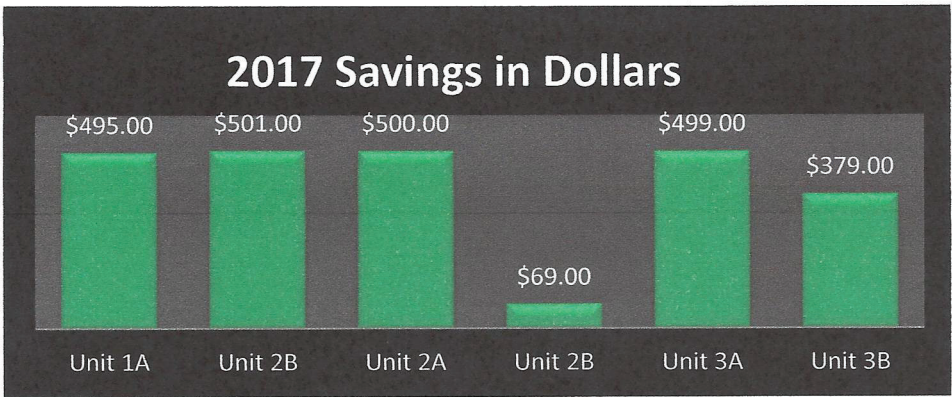


Members of the Tribal Council pose with GRID Alternatives and Stone Child College celebrating a successful project.

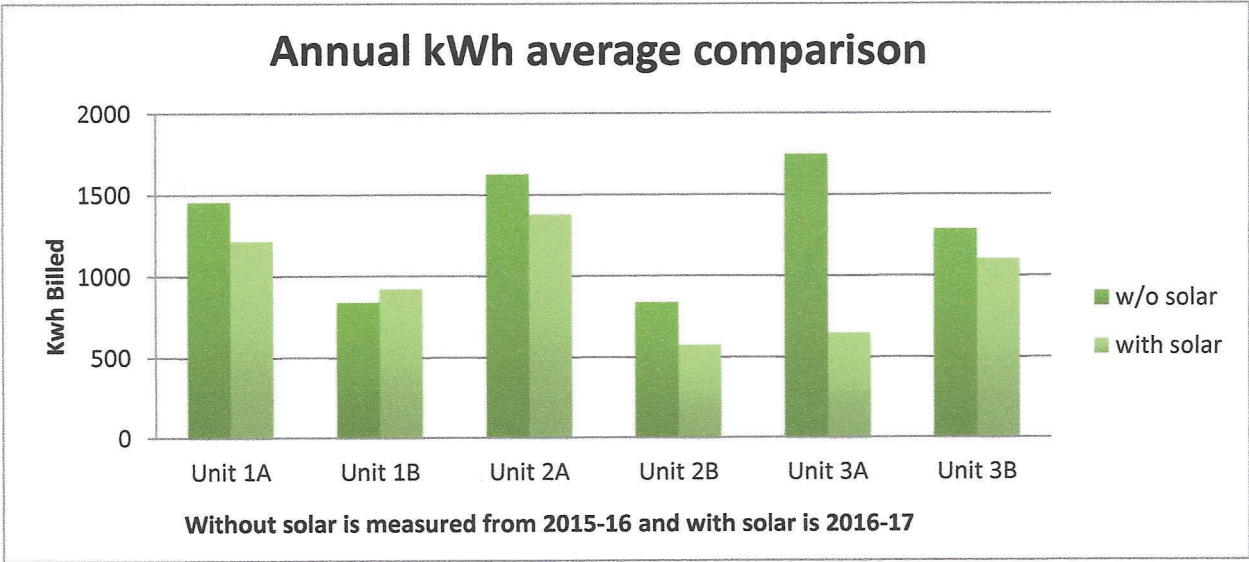
The installation started on October 10th and was completed on October 19th of 2016. Project construction went exactly as planned with no problems. GRID was well prepared and the students from Stone Child College were from the carpentry program and enjoyed something new.

In year two of the project, we monitored the production output of the PV units and ensured they were meeting the specifications. The inverters are equipped with an Enlighten monitoring system which can be viewed through their website. It provides updates right up to the hour and will notify you if the system is not functioning correctly. We did have one of the units that were without power for the majority of the year and the PV units do not function without power.

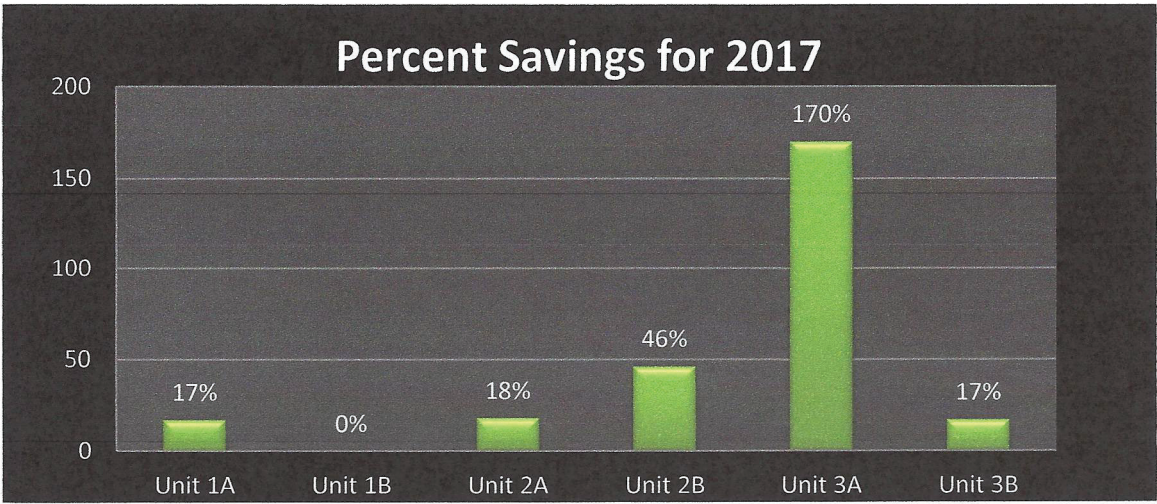
Since the systems were completed in late 2016, I gathered data for the full year of 2017 for production reporting purposes. Unit 2B was the house that was without power for the majority of the year. You can see the systems consistency for the ones that were operational and exceeded our goal of saving \$451 a year per house.



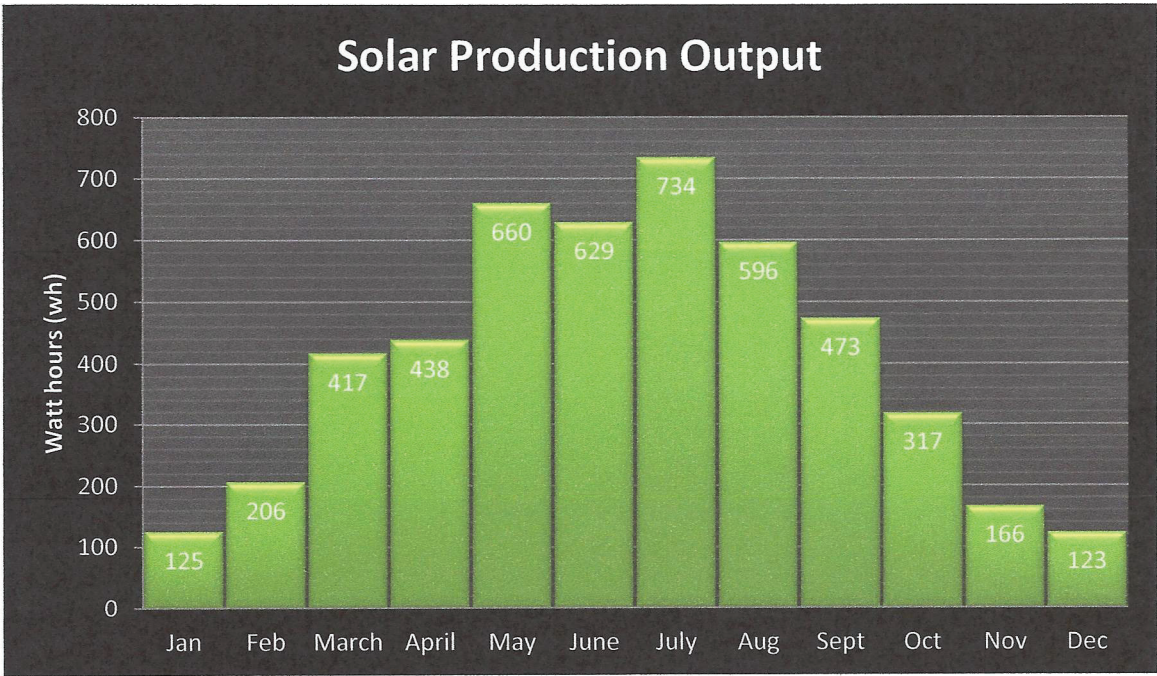
The data gathered for this comparison was from November 2015 to October 2016 when it did not have solar. The “with solar” column is data from November 2016 to October 2017.



This chart shows the savings for each unit



Here you can see the monthly production. This sample was taken from unit 2B.



Section 5.0 Lessons Learned

1. The biggest lesson to come out of this is to communicate with your local utility authority/provider. Each utility provider has their own rules and regulations regarding renewable energy installations. We were unaware of the large interconnection fees associated with this project and put us off budget.
2. Try to implement change in your utility provider to allow net metering. This will increase your annual savings for your project. Our co-op does not allow net metering which limited our savings.
3. If you live in a snowy climate, make sure you have a way to brush off the snow to get the most out of them during the winter.
4. Ensure good quality monitoring of your systems so you can maximize your savings and data collection.
5. Communicate with your tribal leaders, department heads, and community members to promote the positive outcomes of your solar installation.
6. Have a good site selection. We chose rooftop solar on newer model homes so we can maximize our benefit. Many homes on our reservation are very poorly insulated and the savings just fly out the window.

Section 6.0 Conclusions and Recommendations

In conclusion, the Chippewa Cree Tribe views this project as a huge success. The solar equipment has provided low-income families with reduced utility bills and more money for their pocket. Since this was the first renewable energy project in Rocky Boy, it has created interest among our leaders after they have seen the possibilities from the savings. There are now community members here who can install panels through the training they received and can now do our own installations.

Without the assistance from Department of Energy and GRID Alternatives this project would have never happened. I recommend finding a champion in your leadership to gain momentum and go after funding to do projects like this. Also, I cannot stress enough to find out how your utility provider views renewable energy projects and ask all the questions necessary to find out about their rules and regulations. This project was invaluable to our community and has spurred interest about other projects that could be even bigger.

The Chippewa Cree Tribe expresses our sincere gratitude to the Department of Energy and GRID Alternatives for all their support in this successful project!