Final Technical Report Cover Page

Recipient Organization:	Rosebud Sioux Tribe
Project Title:	Sicangu Village Solar Project
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Project Partner(s):	GRID Alternatives Sicangu Wicoti Awayankape Corporation

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Table of Contents

1.0 Executive Summary 1
2.0 Background 1
3.0 Project Objectives 1
4.0 Description of Activities Performed 2
5.0 Conclusions and Recommendations 2
6.0 Lessons Learned 3
7.0 Installation Pictures 3

1.0 Executive Summary

The Sicangu Village Solar Project, spearheaded by the Rosebud Sioux Tribe in partnership with GRID Alternatives, aimed to enhance energy sustainability within the community through the installation of a 149 kW community solar Photovoltaic (PV) array and 13 residential rooftop solar PV systems. Located in Todd County, South Dakota, the project addresses longstanding challenges of rising electricity costs and economic disparities faced by the Tribe. By leveraging solar energy production, the project not only reduces electricity expenses for the community, but also serves as a pivotal step towards achieving the Tribe's energy sovereignty goals. Despite encountering interconnection challenges and delays, particularly exacerbated by regulatory and infrastructure complexities, the project has successfully demonstrated the feasibility of solar energy deployment within the community.

2.0 Background

The Rosebud Sioux Tribe, encompassing over 900,000 acres in Todd County, is one of the largest reservations in the United States. With a population primarily comprised of Sicangu Oyate descendants, the Tribe faces significant socio-economic challenges, including high poverty rates and escalating energy costs. Cherry-Todd Electric Cooperative, the local utility, has steadily increased electricity rates, reflecting broader trends driven by Basin Electric's wholesale price hikes. This context underscores the urgency of initiatives like the Sicangu Village Solar Project, aimed at reducing energy expenditures and fostering economic resilience through sustainable energy solutions. The Tribe's long-term vision emphasizes energy independence and job creation through renewable energy initiatives.

3.0 Project Objectives

The Sicangu Village Solar Project originally aimed to install a 250 kW-AC community solar photovoltaic system, designed to power 30 USDA-funded SWA housing units and one community building. This ambitious undertaking was intended to alleviate the economic burden imposed by escalating electricity costs, which had risen sharply over the years due to wholesale price increases imposed by Basin Electric, impacting Cherry-Todd Electric Cooperative's rate structure. The project also sought to demonstrate the Tribe's commitment to energy sovereignty and sustainability by reducing reliance on external energy sources and circulating savings within the local economy.

However, due to regulatory and operational constraints, particularly Cherry-Todd Electric Cooperative's imposition of a significant monthly charge for distributed generation systems exceeding 150 kW, the project scope was adjusted. Ultimately, the project proceeded with installing a 149 kW-DC ground-mounted community solar array, serving 17 housing units, and 79.1 kW-DC of residential rooftop solar systems, serving 13 residential housing units. Despite the scaled-back scope, the project retained its core objectives of achieving cost savings, promoting energy independence, and building local capacity through educational and training initiatives. By adapting to unforeseen challenges and leveraging local partnerships, the project has successfully demonstrated the feasibility and benefits of solar energy adoption within the Rosebud Sioux Tribe.

4.0 Description of Activities Performed

The project commenced with meticulous planning and site preparation, including the leveling of terrain and installation of necessary infrastructure for both the ground-mounted and rooftop solar systems. Challenges during implementation, such as navigating regulatory requirements and logistical hurdles exacerbated by the COVID-19 pandemic, delayed full operationalization. However, as of the latest update, the ground-mounted solar array has been commissioned and is ready to be operational. All work is completed, including the full AC interconnection and the installation of a net meter by Cherry-Todd. Once a rate is agreed on and an interconnection agreement is signed, the system can be turned on. The 5.8 kW systems that were installed on 13 housing units have been commissioned and have been operating since Dec. 2019.

The following table summarizes expected vs. actual production for the 13 residential systems.

Name	Expected Annual Production (kWh)	Actual Annual Production (kWh)	Estimated Annual Savings
3582 Sicangu Village, Rosebud Nation, SD	8433	8845	$924.30
3586 Sicangu Village, Rosebud Nation, SD	8482	8903	$930.40
3590 Sicangu Village, Rosebud Nation, SD	8482	8575	$896.10
3591 Sicangu Village, Rosebud Nation, SD	8953	9190	$960.40
3592 Sicangu Village, Rosebud Nation, SD	8953	9579	$1001.00
3593 Sicangu Village, Rosebud Nation, SD	8953	8271	$864.30
3594 Sicangu Village, Rosebud Nation, SD	7844	8363	$873.90
3595 Sicangu Village, Rosebud Nation,SD	7842	8251	$862.20
3596 Sicangu Village, Rosebud Native, SD	7842	8824	$922.10
3597 Sicangu Village, Rosebud Nation, SD	7842	6956	$726.90
3598 Sicangu Village, Rosebud Nation, SD	7842	8899	$929.90
3605 Sicangu Village, Rosebud Nation, SD	7554	8478	$886.00
3606 Sicangu Village, Rosebud Nation, SD	7554	8714	$910.60

5.0 Conclusions and Recommendations

The Sicangu Village Solar Project has achieved significant milestones despite facing regulatory and operational challenges. Operational rooftop solar systems now contribute to the electricity needs of 13 housing units, demonstrating immediate cost savings and environmental benefits. The completed ground-mount array is positioned to start generating energy as soon as the Tribe and Utility can come to agreement on how the energy will be used and valued. The project's status underscores the importance of fostering stronger partnerships with

utilities like Cherry-Todd Electric Cooperative to streamline interconnection processes and negotiate favorable terms for renewable energy integration. Moving forward, it is recommended that the Tribe accelerates the establishment of RESCo to centralize energy management and billing, enhancing operational autonomy and responsiveness to community needs. Furthermore, ongoing community engagement and education initiatives are essential to maximize the project's long-term impact and sustainability.

6.0 Lessons Learned

Throughout the project lifecycle, several key lessons have emerged, informing future renewable energy initiatives on the Rosebud Reservation. The complexity of interconnecting solar systems with existing utility infrastructure highlighted the need for clearer communication channels and proactive stakeholder engagement. Regulatory hurdles, including tariff structures and contractual agreements with utilities, necessitated a more robust advocacy strategy to safeguard the Tribe's interests and optimize economic benefits. Prior to any equipment purchases or start of any construction activities it is essential for the Tribe and local utility to have a written agreement outlining how the energy will be used and valued. Operational delays exacerbated by external factors underscored the importance of contingency planning and resilience-building measures in project implementation. Looking ahead, prioritizing local capacity-building initiatives and leveraging emerging energy policies will be crucial in advancing the Tribe's energy sovereignty agenda and ensuring sustainable development.

7.0 Installation Pictures


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