

**COVER PAGE**

**Recipient Organization:** Colusa Indian Community Council

**Project Title:** Housing Energy Connection Project

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**Partners:** N/A

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**2. Executive Summary:**

This project expanded existing medium-voltage distribution to 33 households, a daycare, a mechanical shop, irrigation pumps, and a sewer lift station, all of which previously received electric service from the local electric utility. As part of the project, automatic meter reading (AMR) and advanced metering infrastructure (AMI) was installed to allow the Tribe to set up its own electric metering like a utility.

The primary objective of this project was to expand the Tribe-owned electrical distribution to provide highly reliable electrical service to these existing loads. The objective was successfully met after project completion.

The project reduced high costs for electric energy previously supplied by the utility, by supplanting utility-supplied electric power with Tribe-generated electric power. The project gave the Tribe greater independence from traditional power sources and provided jobs for the community.

**3. Project Objectives:** To expand existing medium-voltage distribution to more than 30 households, a daycare, a mechanical shop, irrigation pumps, and a sewer lift station, which used to receive electric service from the local electric utility. As part of the project, automatic meter reading (AMR) and advanced metering infrastructure (AMI) were installed to allow the Tribe to set up its own, utility-like electric metering system.

**4. Description of Activities Performed:** The project was coordinated and phased to minimize disruption of existing electrical service. Various components were completed, commissioned, and put in service before the entire project was complete. This ensured that any issues with various components were resolved without jeopardizing the overall success of the project. Medium-voltage distribution lines were installed, tested, and energized before service to individual households was transferred from the utility to the tribe-owned distribution. Individual loads and households were added to the tribe-owned distribution one at a time initially to resolve any issues without affecting the entire community.

Finally, automatic meter reading using advanced metering infrastructure was implemented. Before this automation was fully implemented, manual meter reading was used to track energy usage.

The expected end result provided a less expensive, highly reliable, automated, autonomous power system to power all of the tribal households and commercial, agricultural, and industrial facilities on the reservation with ample capacity for future growth.

## 5. Conclusions and Recommendations:

The Tribe took on a massive undertaking with this project and successfully completed it on time and at budget with relatively few hurdles, even despite the challenges posed by the pandemic. This project has allowed the majority of the Tribe's members to enjoy electricity supplied by their own cogeneration plant, via their own micro-grid at a cheaper rate than the local utility. This power is also ultra-reliable and backed up by a 4 megavolt amperes (MVA) uninterruptible power supply (UPS) system, unlike the local utility's power, which is delivered to the reservation at the end of a very weak circuit with historically very high outage rates.

This has led the Tribe to consider future micro-grid expansions across multiple properties that they own, so that they can continue to become even more self-reliant.

The Tribe has offset 2,138,538 kilowatt-hours (kWhrs) from the local utility during the verification period, as a result of this project. This has resulted in a savings of \$338,958.27, far exceeding initial savings projections.



**Image 1: New transformer, medium-voltage sectionalizing cabinet, and meter stack**



**Image 2: One of several new underground electrical vaults**



**Image 3: Underground medium-voltage cable trenching**



## 6. Lessons Learned:

We learned a lot about street lighting requirements and how streetlights are sized appropriately for any given area. We also learned a lot about underground installations, how the weather impacts construction schedules, and how equipment and material delays can put a project's brakes on very quickly.

In general, however, this project went as smoothly as we could have hoped, all contractors maintained their commitments, and all suppliers did their best to accommodate our requirements in a timely fashion. The Tribe is definitely looking forward to future micro-grid expansions, as a result of how successful this one has been.



**Image 4: The Tribe's reservation completely powered by their own micro-grid**