

DOE 2022 TRIBAL ENERGY REVIEW



Office of Indian
Energy and
Economic
Development.

SICANGU VILLAGE SOLAR PROJECT

Rosebud Sioux Tribal
Headquarters, Rosebud, South
Dakota

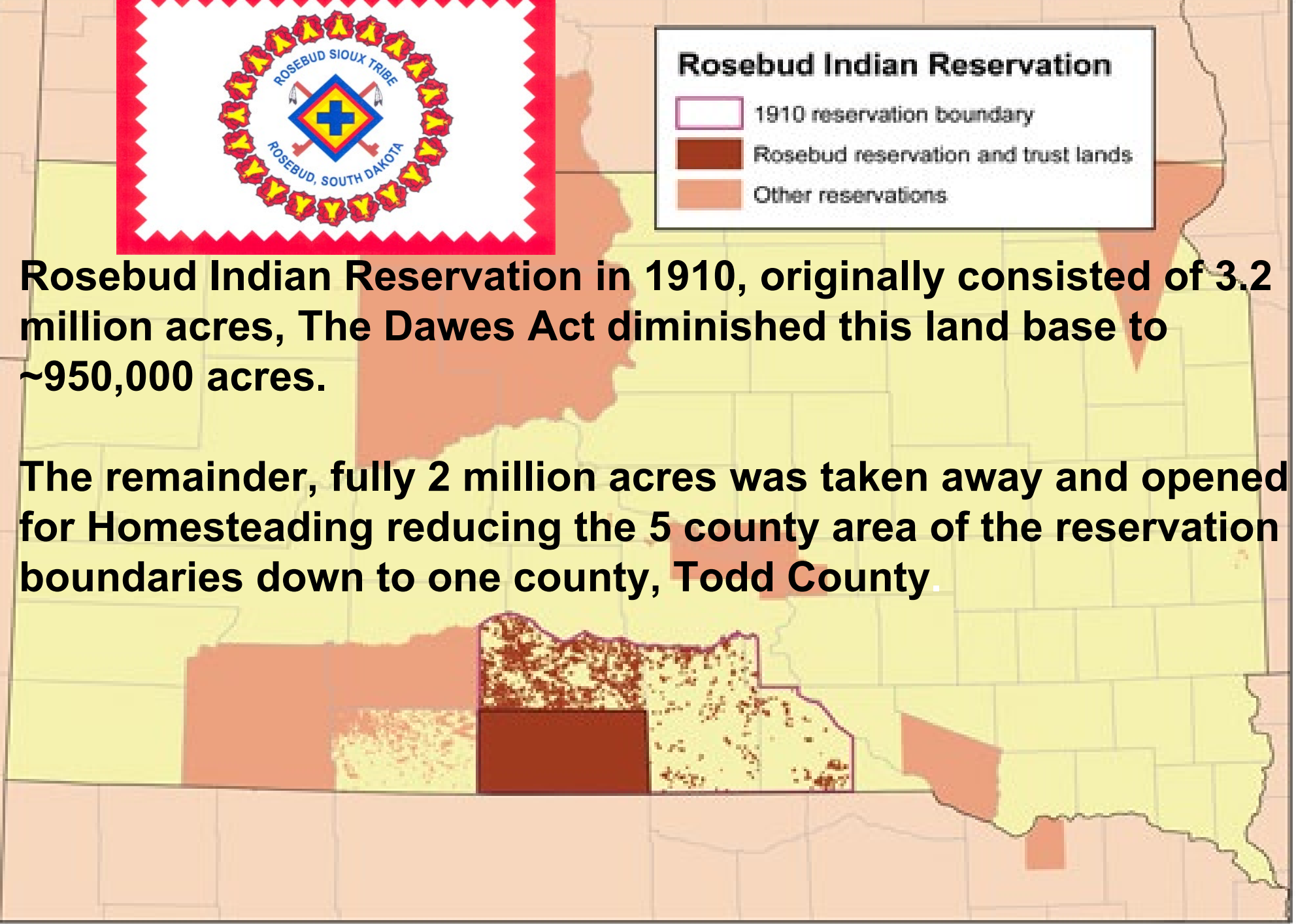


Rosebud Indian Reservation

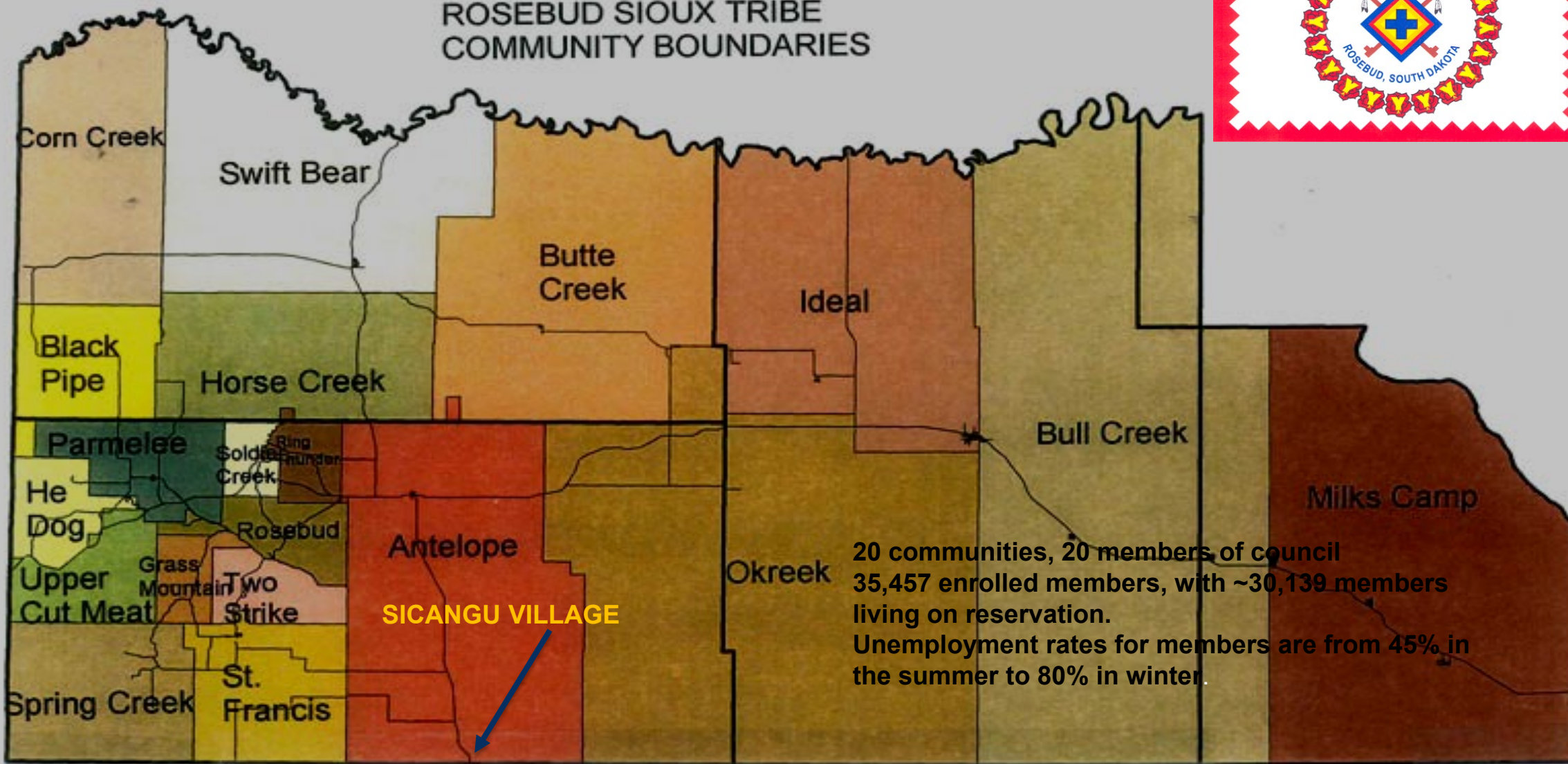
- 1910 reservation boundary
- Rosebud reservation and trust lands
- Other reservations

Rosebud Indian Reservation in 1910, originally consisted of 3.2 million acres, The Dawes Act diminished this land base to ~950,000 acres.

The remainder, fully 2 million acres was taken away and opened for Homesteading reducing the 5 county area of the reservation boundaries down to one county, Todd County.



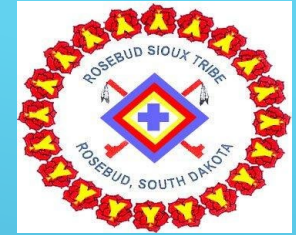
ROSEBUD SIOUX TRIBE COMMUNITY BOUNDARIES



20 communities, 20 members of council
35,457 enrolled members, with ~30,139 members living on reservation.
Unemployment rates for members are from 45% in the summer to 80% in winter.



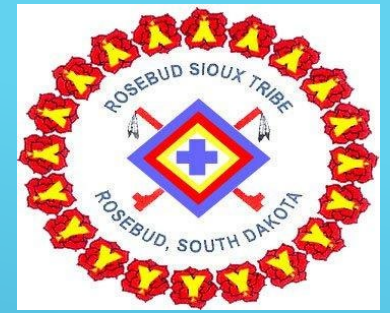
CHANGES IN RATES OF CHERRY-TODD ELECTRIC OVER THE FOLLOWING YEARS, 2003-2017



Year	Power Costs to CTE	% increase	Consumer Rate increases
2003	\$3,100,487.00		
2004	\$3,301,285.00	6.48%	
2005	\$3,375,773.00	2.26%	
2006	\$3,767,277.00	11.60%	
2007	\$3,907,134.00	3.71%	
2008	\$4,489,925.00	14.92%	
2009	\$4,969,624.00	10.68%	22.0%
2010	\$5,929,792.88	19.32%	8.4%
2011	\$6,678,890.00	12.63%	8.1%
2012	\$7,813,674.54	16.99%	9.0%
2013	\$8,157,205.51	4.40%	
2014	\$7,820,287.00	<4.13%>	
2015	\$7,094,184.00	<9.28%>	2.7%
2016	\$7,717,184.00	8.08%	2.0%
2017	\$8,488,902.40	10.00%	4.4%
Percent change		107.66%	56.6%



LOW INCOME HOME ENERGY ASSISTANCE PROGRAM COSTS

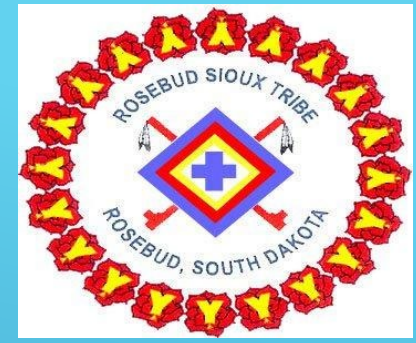


- ▶ 2003/04.....\$ 665,525.00
- ▶ 2006/07.....\$ 954,997.00
- ▶ 2013/14.....\$2,713,645.50
- ▶ 2014/15.....\$2,578,311.68
- ▶ 2015/16.....\$3,200,000.00
- ▶ 2016/17.....\$2,900,000.00
- ▶ Federal LIHEAP assistance, annually is ~\$963,000.00
- ▶ Remaining monies needed is supplied internally





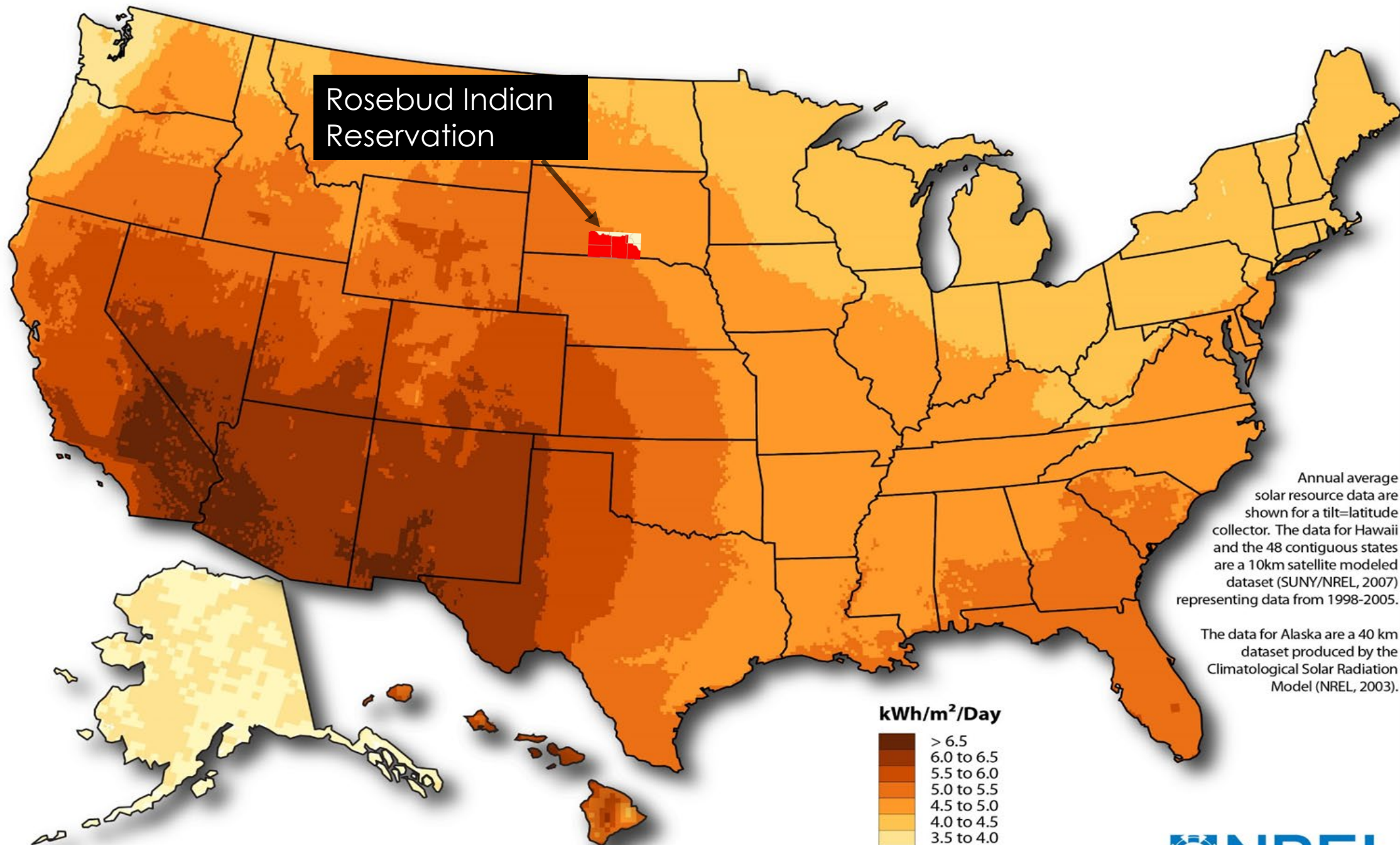
THE ROSEBUD SIOUX TRIBAL STRATEGIC ENERGY PLAN



An over-arching living document that will:

- Align and focus the tribal energy effort
- Provide the foundation for planning and executing key tribal energy initiatives that will lead to development and implementation of reservation wide energy efficiency, cost effectiveness and self-sustainment for the long term.
- To document and understand our tribal energy footprint, from the residential, government and business level to the agricultural level.

Photovoltaic Solar Resource of the United States



Annual average solar resource data are shown for a tilt=latitude collector. The data for Hawaii and the 48 contiguous states are a 10km satellite modeled dataset (SUNY/NREL, 2007) representing data from 1998-2005.

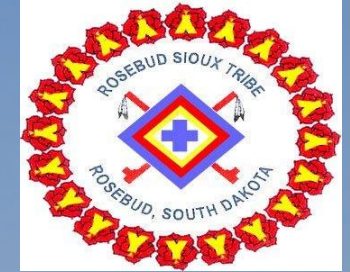
The data for Alaska are a 40 km dataset produced by the Climatological Solar Radiation Model (NREL, 2003).

kWh/m²/Day

- > 6.5
- 6.0 to 6.5
- 5.5 to 6.0
- 5.0 to 5.5
- 4.5 to 5.0
- 4.0 to 4.5
- 3.5 to 4.0



DOE 2016 GRANT \$261,739.00



FEDERAL SHARE: \$129,766.00 COST SHARE \$131,973.00



GRID ALTERNATIVE SHARE IS \$80,623.00

SWA CORPORATION SHARE IS \$51,350.00

**SWA WILL GET A \$20,000 PHOTOVOLTAIC SYSTEM
FOR \$5,135.00 EACH.**



DOE 2018 GRANT AWARD

\$897,000.00

FEDERAL SHARE \$448,500.00

COST SHARE \$448,500.00



Original commitments meeting Federal cost share

- ▶ Sicangu Wicoti Awanykape Corporation \$348,500.00
- ▶ Grid Alternatives offered in-kind in training and Equipment \$100,000.00
- ▶ **NEW AWARD SUPPORT:** Enter TSAF Tribal Solar Accelerator Fund Grant Award which reduced SWA's commitment by \$150,000.00. Administrated by Grid Alternatives through a Wells Fargo Grant award



Account #	Before Solar		
	Year	kWh Usage	Billing
26241	2016/2017	46,144	\$4,307.80
26242	2016/2017	20,224	\$2,218.86
26243	2016/2017	21,093	\$2,334.97
26244	2016/2017	31,122	\$3,002.71
26245	2016/2017	27,626	\$2,814.62
26253	2016/2017	27,406	\$2,631.26
26247	2016/2017	27,915	\$2,952.22
26182	2016/2017	30,784	\$3,181.14
26183	2016/2017	23,210	\$2,330.34
26184	2016/2017	47,010	\$4,317.49
25632	2016/2017	25,840	\$2,642.68
25633	2016/2017	25,720	\$2,617.24
25634	2016/2017	27,364	\$2,665.81
TOTAL		381,458	\$38,017.14

	After Solar		
	Year	kWh Usage	Billing
	2021/2022	24,069	\$2,367.62
	2021/2022	10,713	\$1,082.00
	2021/2022	23,143	\$2,177.36
	2021/2022	13,379	\$1,606.51
	2021/2022	22,657	\$2,465.74
	2021/2022	25,762	\$2,261.30
	2021/2022	20,761	\$2,052.16
	2021/2022	11,309	\$1,177.79
	2021/2022	24,370	\$2,276.36
	2021/2022	22,837	\$1,947.82
	2021/2022	35,197	\$3,004.40
	2021/2022	14,421	\$1,447.83
	2021/2022	34,075	\$2,886.29
		282,693	\$26,753.18

Total Cost Savings

\$11,263.96

Total Energy Savings

98,765 kWh

ORIGINAL PROJECT PLANS

Supply Power to 32 Units/meters plus Community center with a 250 kW solar field at Sicangu Village

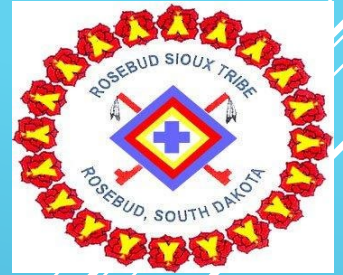
Unknown prior to grant application.

Policy by Wholesale provider Basin Electric in agreement with Cherry-Todd states: All projects over 150 kW will be charged \$4,000.00 a month standby rate. \$48,000.00 yearly



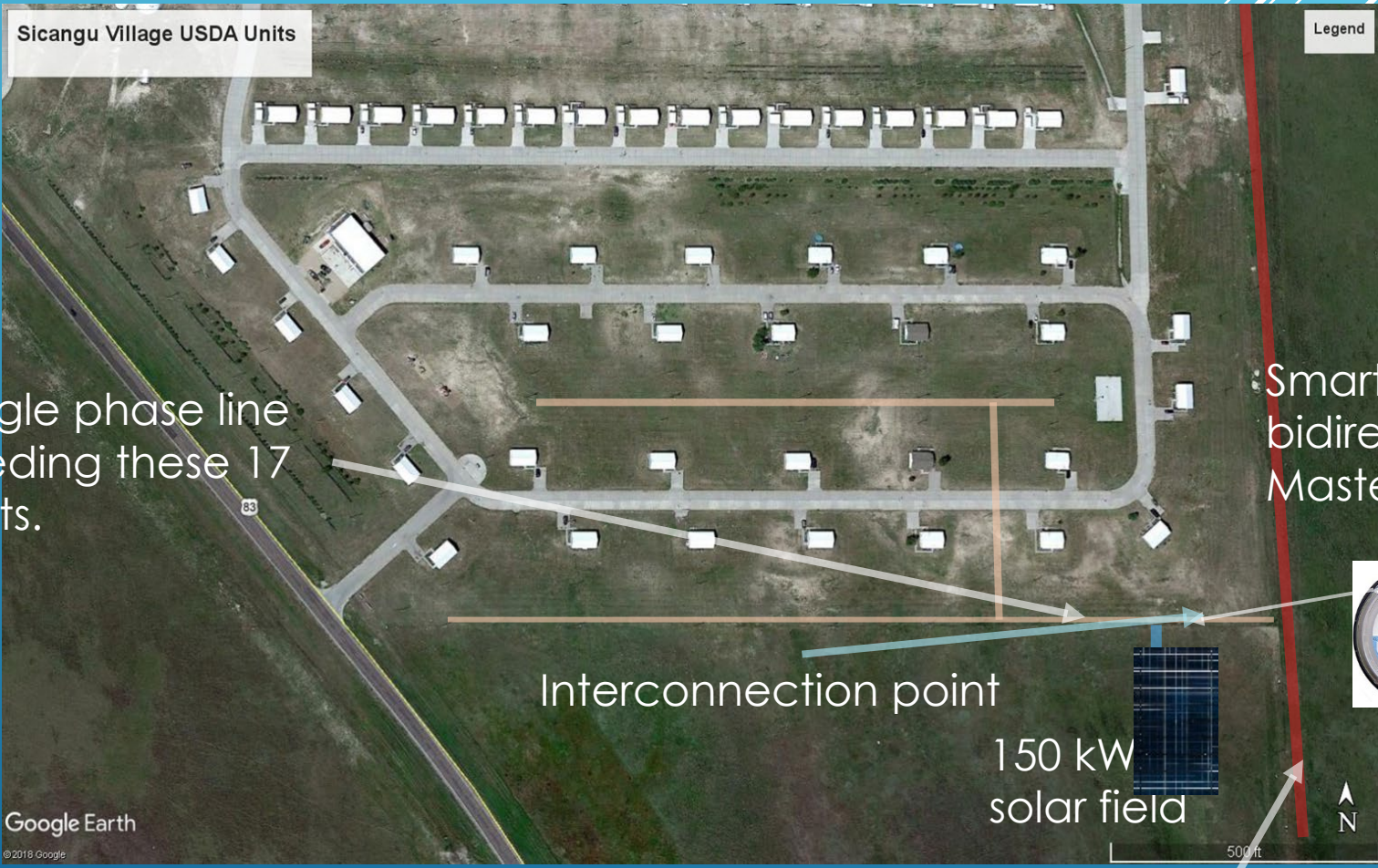


Sicangu Village Solar Project



Intent now was to build a 150 kW Solar Field to accommodate 17 SWA Units, offsetting the cost of the grid connected price of 10.6 cents of kwh.

The other 13 units would get roof mounted 5.8 kw systems which the grant would cover.



Single phase line feeding these 17 units.

Smart meter, bidirectional Master meter

Interconnection point

150 kW solar field

3 phase line

New plans

Sicangu Village USDA Units

Legend

Units surrounded in blue will get 5.8 kW residential solar rooftop installation.

Units surrounded by green will receive a portion of their electrical power from a 150 kW solar field while the sun shined.



New plans

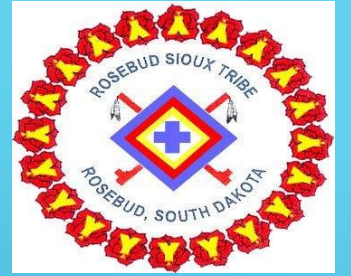
SICANGU VILLAGE SOLAR PROJECT



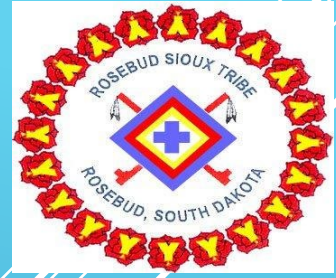
COMPLETED 149
KW SOLAR FIELD
COMMISSIONING
TOWARDS THE END
OF NOVEMBER
2021



Conditions and use of the 149 kW Solar Field



- ▶ All 17 units that were once to be provided partial power from the solar field offsetting the 10.6 cents a kilowatt hour cost will continue to receive power from the grid through the local utility as before and nothing from the field, as arbitrarily determined by the Cherry-Todd utility.
- ▶ Cherry-Todd will purchase all power produced by the solar field based on what it considers it's **AVOIDED COST!** As per a directive in a PURPA Regulation to consumer owned power generation plants and it's policy agreement with BASIN Electric, Cherry-Todds power provider.
- ▶ The purchase shall go to Sicangu Wichoti Awayankape Corporation in the form of credit on these 17 units, as SWA Corporation will be considered in the owners of the solar field.
- ▶ At this moment in time, the tribe or SWA does not know what Cherry-Todd will pay per kwh for this power. It is anticipated to be 2.44 cents per kilowatt hour. Basin Electric has always stated that it costs them 2.44 cents to produce 1 kwh of electricity and calls this the **AVOIDED COST.**
- ▶ In Jan of 2019 the Rosebud Sioux Tribe passed a net metering law that may challenge Cherry-Todds action in this pricing.



FUTURE THOUGHTS ON DEVELOPMENTS FOR THIS AREA

Immediately install devices on 5 to 8 of these 17 units to measure their average electrical uses over winter in 15-minute intervals to understand the costs of installing battery storage for these 17 units.

Conduct cost analysis on ROI of completely disconnecting these 17 units from the Grid by the addition of energy storage, on site electrical production by propane generator/s, additional ground mount solar arrays or small size wind turbine/s continually charging the storage systems.

<https://vimeo.com/277556977/4204794c52>



- ▶ Ken Haukaas, Rosebud Sioux Tribe,
ken_haukaas@yahoo.com
ken.haukaas@rst-nsn.gov

Work phone (605) 747-2575
Cell phone (605) 319-1427

- ▶ Tim Willink, Grid Alternatives



PROJECT CONTACTS