

# SICANGU VILLAGE SOLAR PROJECT



Ken Haukaas  
Director of RST Forestry  
Former Tribal Utilities Commissioner

Tim Willink  
Director of Tribal Programs  
Grid Alternatives



# DOE 2020 TRIBAL ENERGY REVIEW

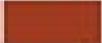
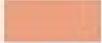


Office of Indian  
Energy and  
Economic  
Development.

Rosebud Sioux Tribal  
Headquarters, Rosebud, South  
Dakota



## Rosebud Indian Reservation

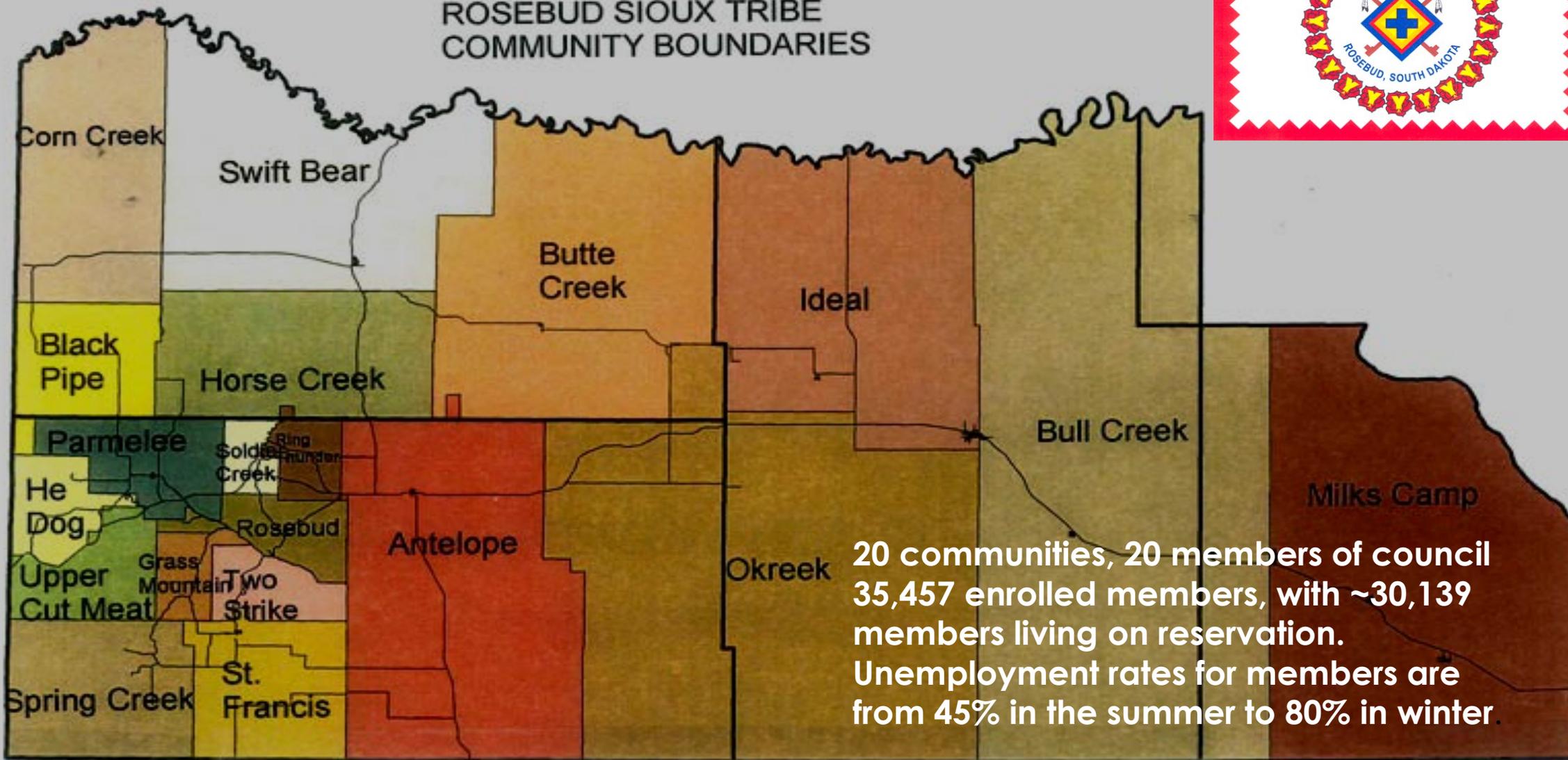
-  1910 reservation boundary
-  Rosebud reservation and trust lands
-  Other reservations

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

**Every Head of Household was given 160 acres, every single adult 80 acres and every minor 40 acres.**

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

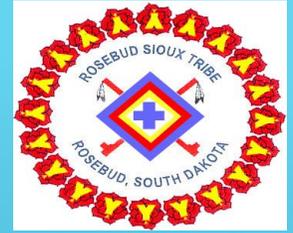
# ROSEBUD SIOUX TRIBE COMMUNITY BOUNDARIES



**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.**



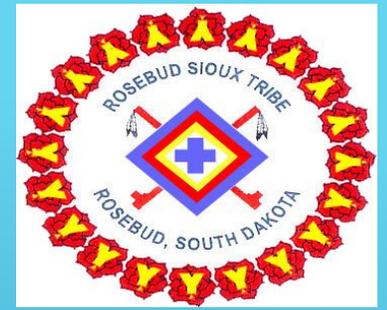
# CHANGES IN RATES OF CHERRY-TODD ELECTRIC OVER THE FOLLOWING YEARS, 2003-2017



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		<b>107.66%</b>	<b>56.6%</b>



# LOW INCOME HOME ENERGY ASSISTANCE PROGRAM COSTS

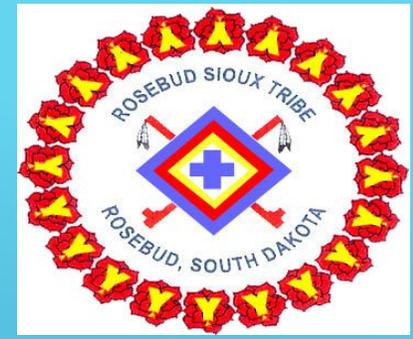


- ▶ 2003/04.....\$ 665,525.00
- ▶ 2006/07.....\$ 954,997.00
- ▶ 2013/14.....\$2,713,645.50
- ▶ 2014/15.....\$2,578,311.68
- ▶ 2015/16.....\$3,200,000.00
- ▶ 2016/17.....\$2,900,000.00
- ▶ Federal LIHEAP assistance, annually is ~\$963,000.00 and may not be funded at this level in the future.
- ▶ Remaining monies supplied internally





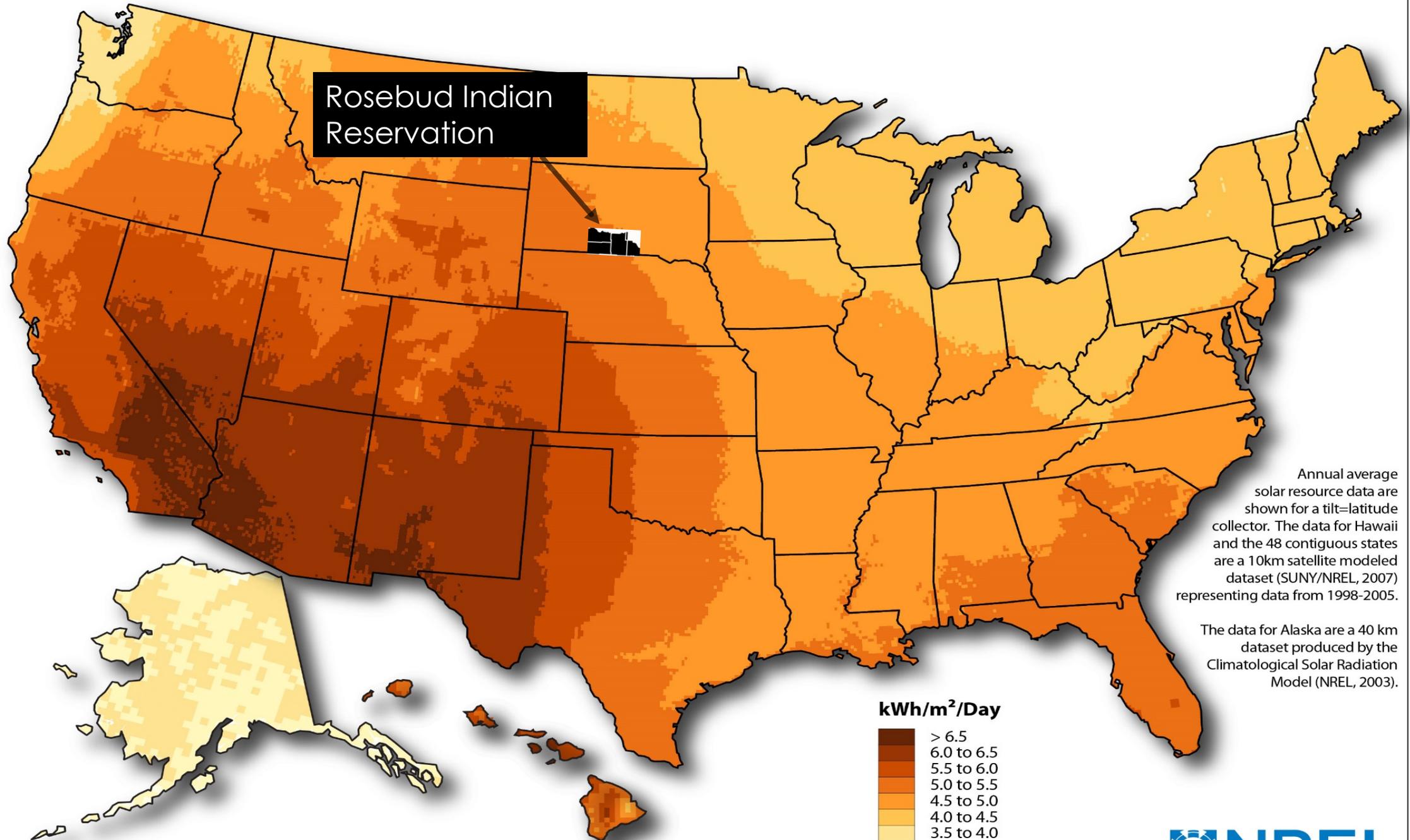
# THE ROSEBUD SIOUX TRIBAL STRATEGIC ENERGY PLAN



An over-arching living document that will:

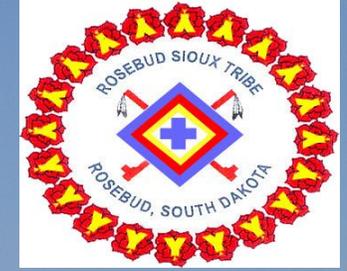
- Align and focus the tribal energy effort
- Provide the foundation for planning and executing key tribal energy initiatives that will lead to development and implementation of reservation wide energy efficiency, cost effectiveness and self-sustainment for the long term.
- To document and understand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

# Photovoltaic Solar Resource of the United States





# 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.**

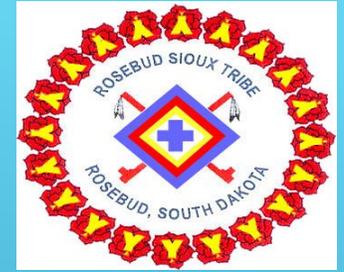


# DOE 2018 GRANT AWARD

\$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. Adminstrated by Grid Alternatives through a Wells Fargo Grant award



# ORIGINAL PROJECT PLANS

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

**Unknown prior to grant application.**

**Policy by Wholesale provider states: All projects over 150 kW will be charged \$4,000.00 a month standby rate. \$48,000.00 yearly**

**Known parameters if RST claims those units in this project as belonging to RESCo, the new tribal utility.**

**RST/RESCo Required to purchase whole infrastructure ~\$272,00.00**

**Provide O&M on infrastructure**

**Insurance for all of infrastructure**



Sicangu Village USDA Units

Legend

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

17 Units  
surrounded by  
green will  
receive a  
portion of their  
electrical  
power from a  
150 kW solar  
field.



New plans

Google Earth

© 2018 Google

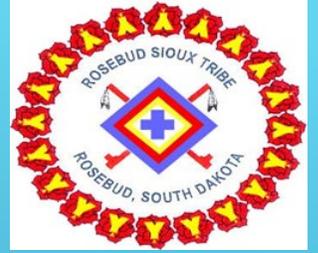
500 ft

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# SICANGU VILLAGE SOLAR PROJECT



Grid Alternatives and local volunteers pictured below began working on the 13 units in 2019 outlined in Blue in the previous slide slated to get 5.8 kw roof mounts on these units



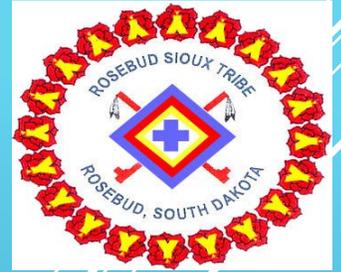
# Results of energy use and savings on the 13 units with roof top mounts of 5.8 kw each for approx. 1 year.

Unit	2017 Cost (\$)	2020 Cost (\$)	2017 Use (kWh)	2020 Use (kWh)	Total Savings (\$)	Total Savings (kWh)
3582 (Vacant)	\$ 2,180.83	\$ 1,164.93	25720	17847	\$ 1,015.90	7873
3586	\$ 2,205.71	\$ 2,333.90	25840	36315	\$ (128.19)	-10475
3590	\$ 2,210.43	\$ 1,629.14	27364	23978	\$ 581.29	3386
3591	\$ 3,482.88	\$ 1,420.10	47010	21821	\$ 2,062.78	25189
3592	\$ 1,932.41	\$ 1,634.76	23210	23145	\$ 297.65	65
3593	\$ 2,666.98	\$ 1,807.96	30784	22259	\$ 859.02	8525
3594	\$ 2,341.82	\$ 1,326.55	27626	17896	\$ 1,015.27	9730
3595	\$ 2,490.67	\$ 2,096.73	31122	27363	\$ 393.94	3759
3596	\$ 1,987.54	\$ 1,538.53	21093	14613	\$ 449.01	6480
3597	\$ 1,873.02	\$ 896.73	20251	11051	\$ 976.29	9200
3598	\$ 3,481.75	\$ 1,275.67	46144	17177	\$ 2,206.08	28967
3605	\$ 2,468.22	\$ 1,522.33	27915	19886	\$ 945.89	8029
3606 (Vacant)	\$ 2,165.53	\$ 1,748.26	27406	26897	\$ 417.27	509

Total Savings:	\$ 11,092.20
Total kWh Savings:	101237
Average Cost Change:	-33%
Average Use Change:	-23%
Total Solar Production	
(kWh):	101137



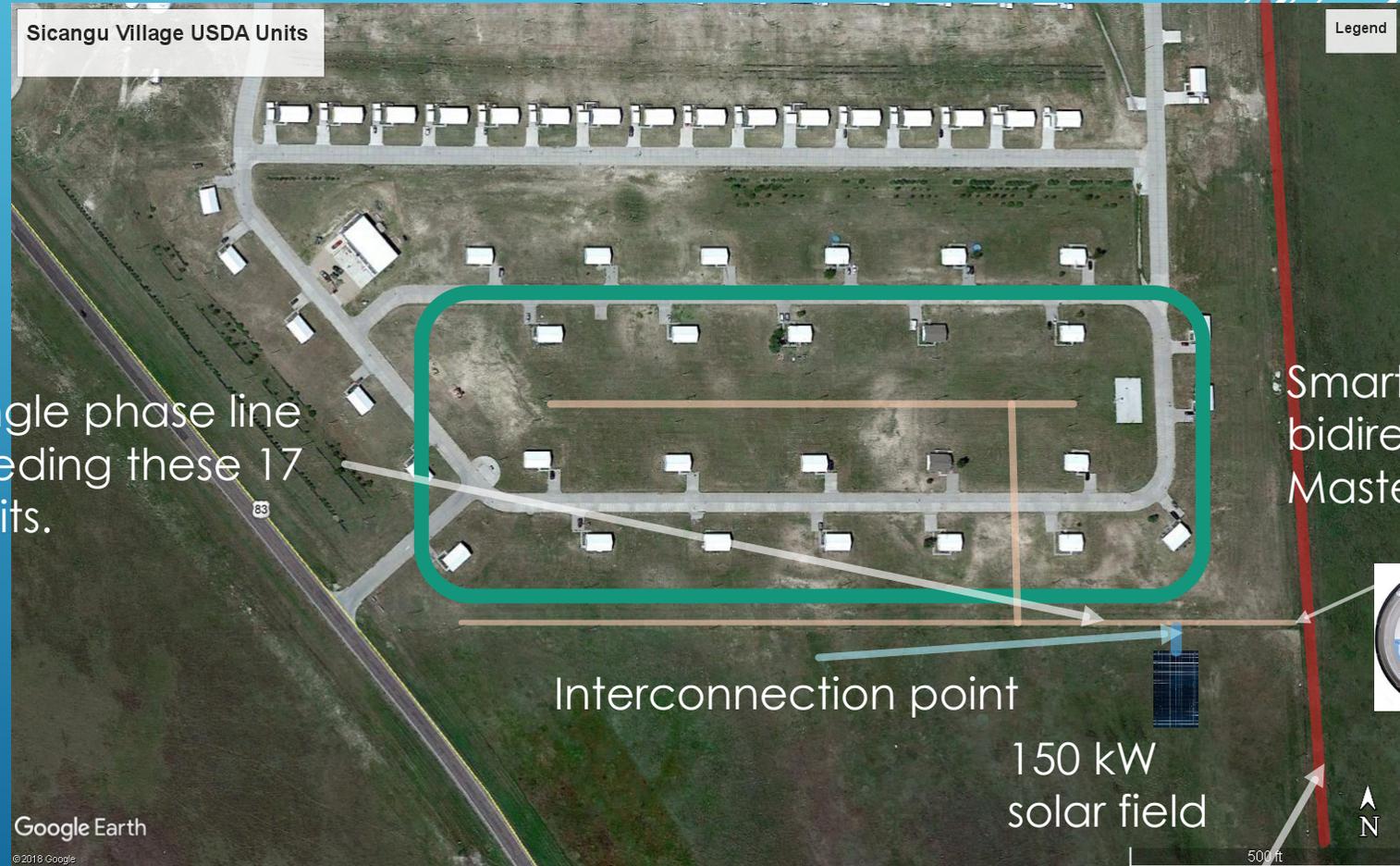
# Sicangu Village Solar Project



Build a 150 kW Solar Field to accommodate 17 SWA Units.

Forego Purchase of infrastructure \$144,500.00  
Loss of \$30.00 a month x 17 units = \$510.00 a month.  
\$6,120.00 annually  
O&M to be handled by Cherry-Todd  
No insurance by RESCo on existing infrastructure.

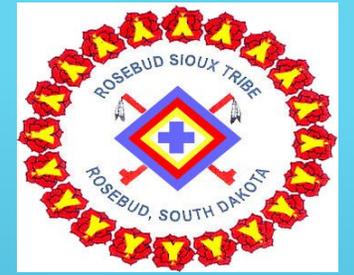
Rate Charge to SWA Units same as Cherry-Todds Basic Charge \$30.00 monthly, 10.6 cents kwh up to 900 kwh, 9.02 cents on anything over 900 kwhs



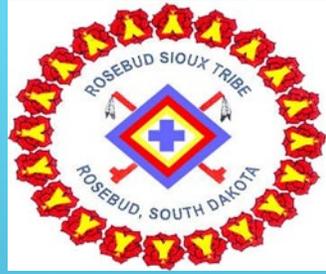
New plans



# Conditions of the 150 kW Solar Field with new Tribal Utility RESCo, Rosebud Energy Services Company and Cherry-Todd the local utility.



- ▶ RESCo will administrate a monthly billing system to SWA on the 17 units receiving electricity from this 150 kW solar field based on the same residential rate they have always been charged.
- ▶ RESCo will pay the Commercial Rate Billing on this master meter to Cherry-Todd on a monthly basis of power that flows from the grid for these 17 units at night or otherwise.
- ▶ The 30.00 basic charge to the 17 units in this group will flow through RESCo and that payment will go directly to Cherry-Todd
- ▶ Any excess power that is pushed back through the master meter will be paid or credited to RESCo at 2.44 cents kwh
- ▶ This Master Meter and RESCo will be subject to peak demand charges!

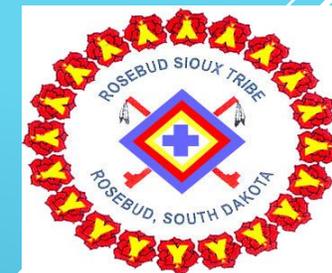


Work stoppage in the Fall of 2019 and Spring of 2020 was due to subsurface and surface flooding and of course Covid-19 pandemic.

Area slated for 150 kw ground mount solar field had water surfacing and flooding the area, along with some crawl space flooding and concern by the local housing authority about possible moving of those affected by this flooding.



# FUTURE THOUGHTS ON DEVELOPMENTS FOR THIS AREA



After a cycle of one full year production of the 150 kW solar field, anticipate installing energy storage to shave peak demand costs.

Conduct cost analysis on ROI of completely disconnecting from Grid by the addition of energy storage, electrical production by propane generators and community size wind turbine/s.

- ▶ Ken Haukaas, Rosebud Sioux Tribe,

[ken\\_haukaas@yahoo.com](mailto:ken_haukaas@yahoo.com)

[ken.haukaas@rst-nsn.gov](mailto:ken.haukaas@rst-nsn.gov)

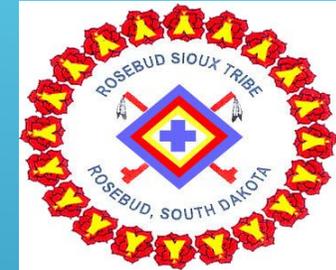
Work phone (605) 747-2575

Cell phone (605) 319-1427

- ▶ Tim Willink, Grid Alternatives

[twillink@gridalternatives.org](mailto:twillink@gridalternatives.org)

Cell phone (303) 968-1633



# PROJECT CONTACTS

