

DOE 2016 Tribal
Energy Review



Office of Indian
Economic and
Energy
Development.

And as I looked and wept, I saw that there stood on the north side of the starving camp a sacred man who was painted red all over his body, and he held a spear as he walked into the center of the people, and there he lay down and rolled. And when he got up, it was a fat bison standing there, and where the bison stood, a sacred herb sprang up right where the tree had been in the center of the nation's hoop. The herb grew and bore four blossoms on a single stem while I was looking – a blue, a white, a scarlet, and a yellow, and the bright rays of these flashed to the heavens

*I know now what this meant, that the bison were the gift of a good spirit and were our strength, but we should lose them,
and from the same good spirit we must find another strength.*

Black Elk speaks, 1932

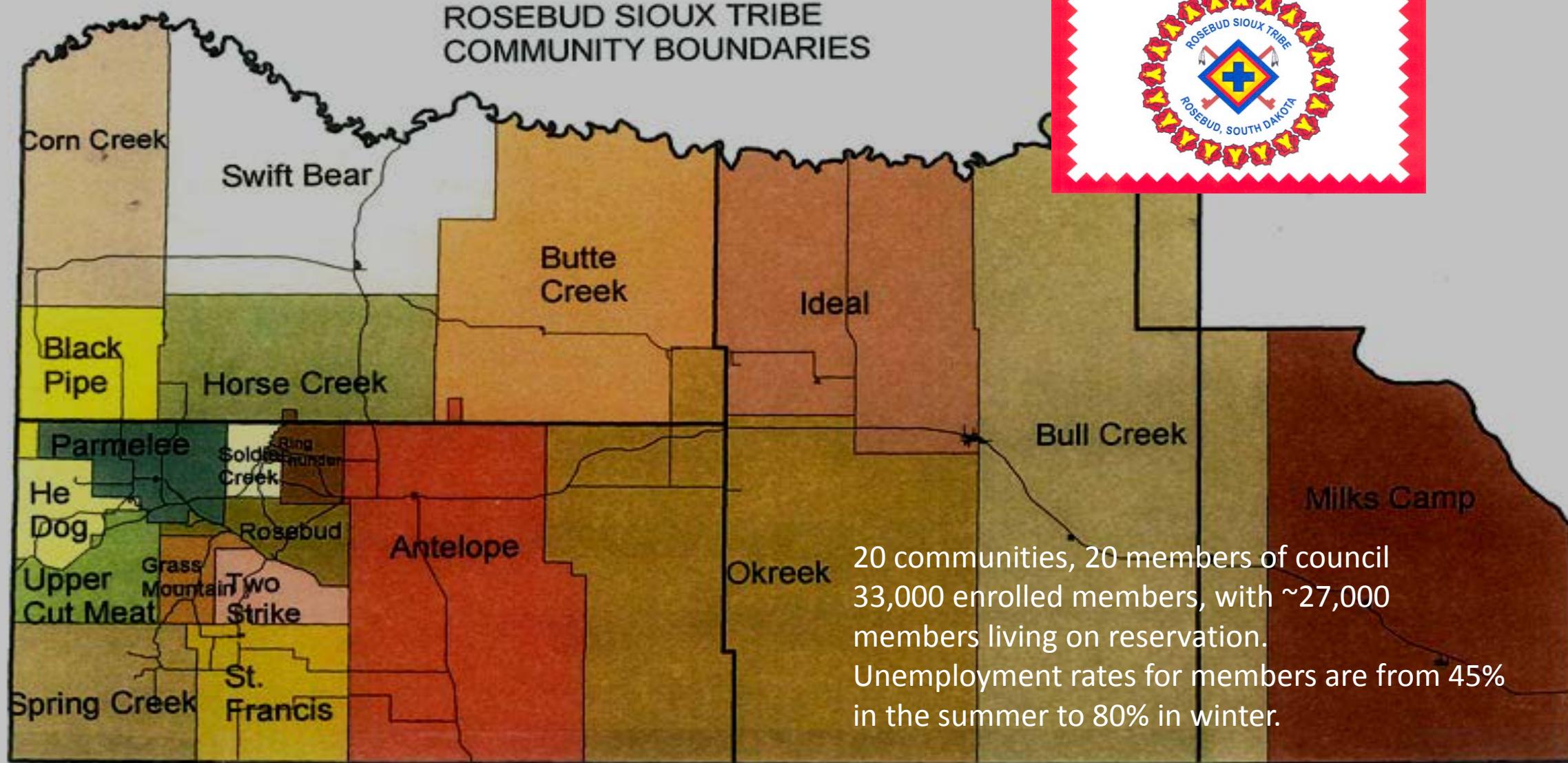




Rosebud Indian Reservation

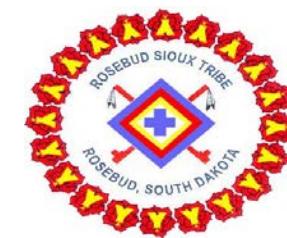
- 1910 reservation boundary
- Rosebud reservation and trust lands
- Other reservations

**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 was opened for Homesteading reducing the 5 county area of the reservation boundaries down to one county, Todd County.**



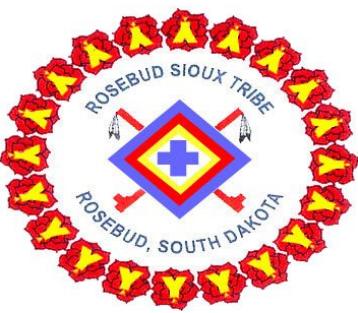


Changes in rates of Cherry-Todd Electric over the following years, 2003-2015



Wholesale Rates Increases Consumer Rate Increases

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			2.7%
Percent change		98.86%	50.2%



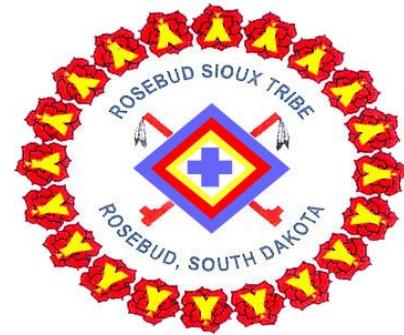
LIHEAP Program Costs

- 2003.....\$ 665,525.00
 - 2006.....\$ 954,997.00
 - 2013.....\$2,713,645.50
 - 2014.....\$2,578,311.68
 - 2015.....\$2,999,426.48
-
- Federal LIHEAP assistance, annually is ~\$963,000.00 and is starting to decrease annually
 - Remaining monies supplied internally





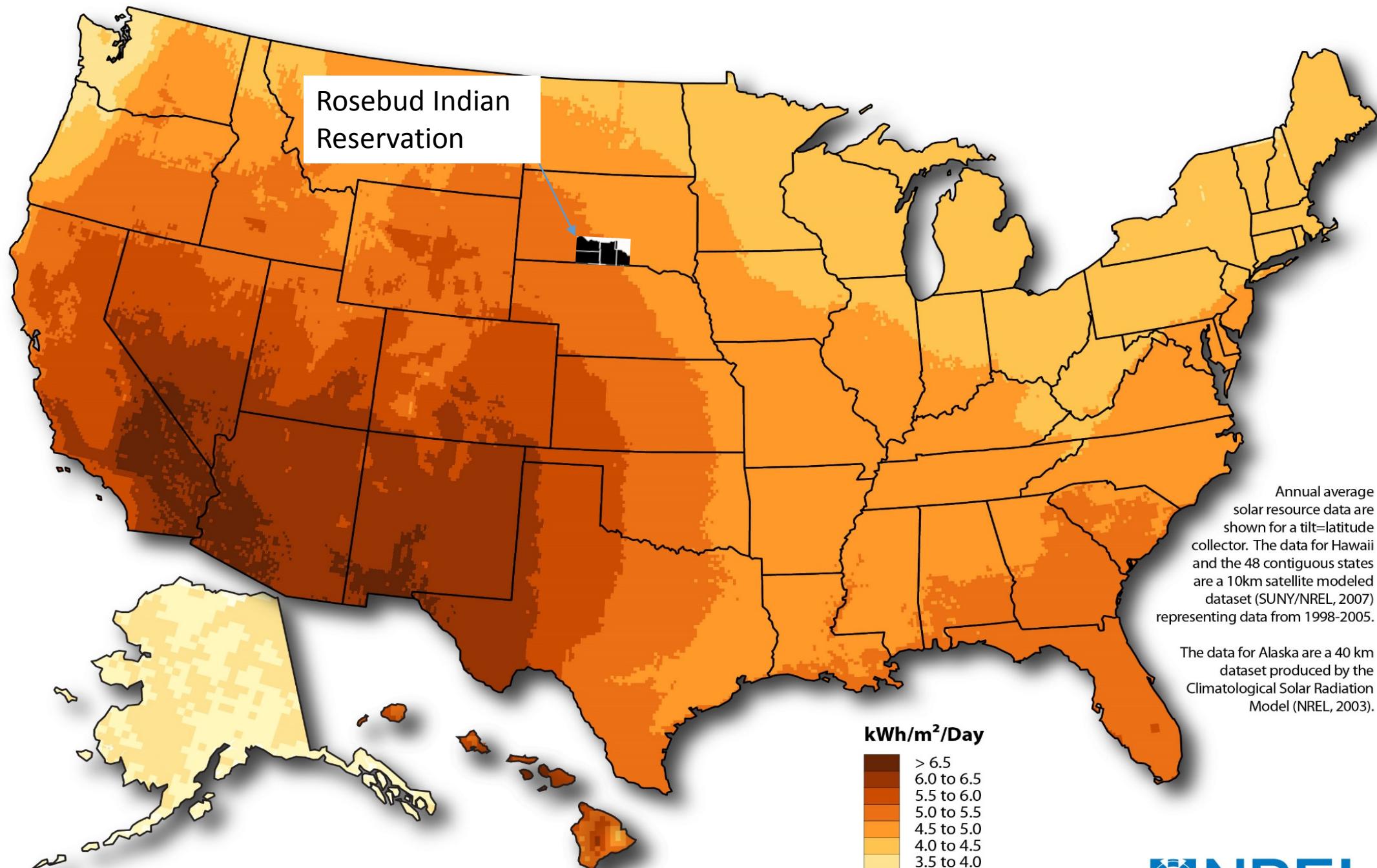
The Rosebud Sioux Tribe Strategic Energy Plan



An over-arching living document that will:

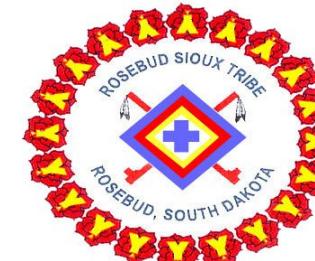
- Align and focus the tribal energy effort
- Provide the foundation for planning and executing key tribal energy initiatives that will lead to development and implementation of reservation wide energy efficiency, cost effectiveness and self-sustainment for the long term.
- To document and understand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

Photovoltaic Solar Resource of the United States





**SWA Corporation, Sinte Gleska University,
GRID Alternatives
Rosebud Sioux Tribal Utilities Partnership
Project**



**10 SWA RENTAL UNITS
WICOZANI SUBDIVISION
RING THUNDER
SOLAR ENERGY PARTNERSHIP INITIATIVE (SEPI)**

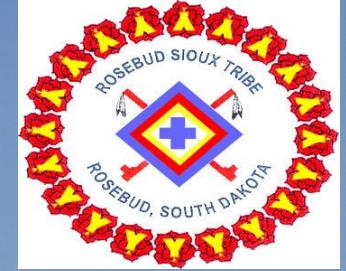
Department of Energy, Office of Energy Efficiency & Renewable Energy

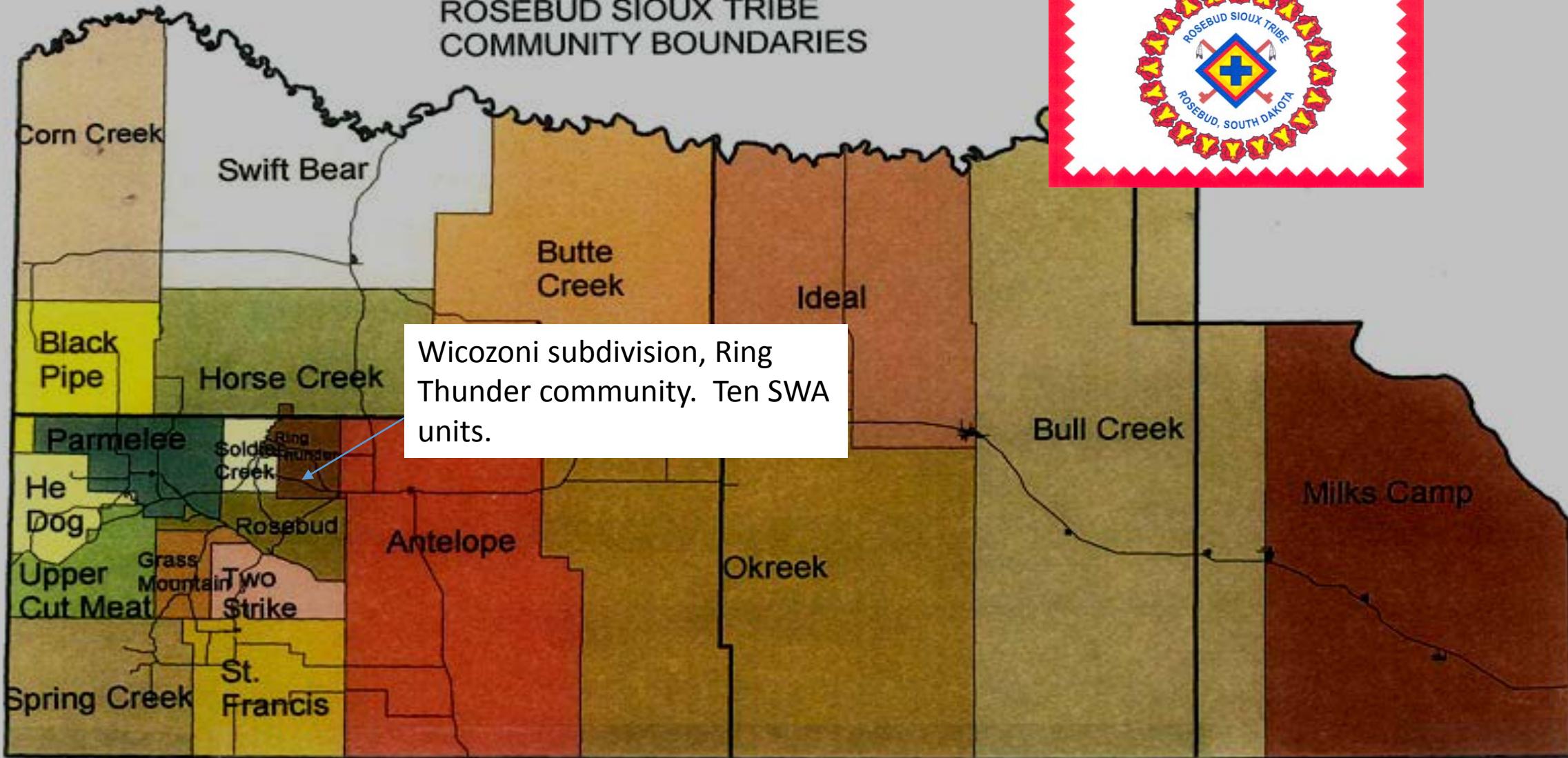




DOE 2016 Grant \$261,739.00

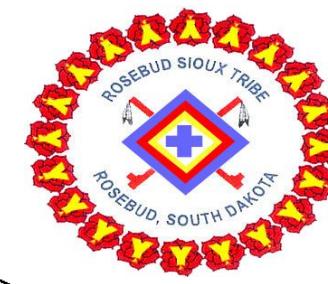
Federal Share: \$129,766.00 Cost Share \$131,973.00



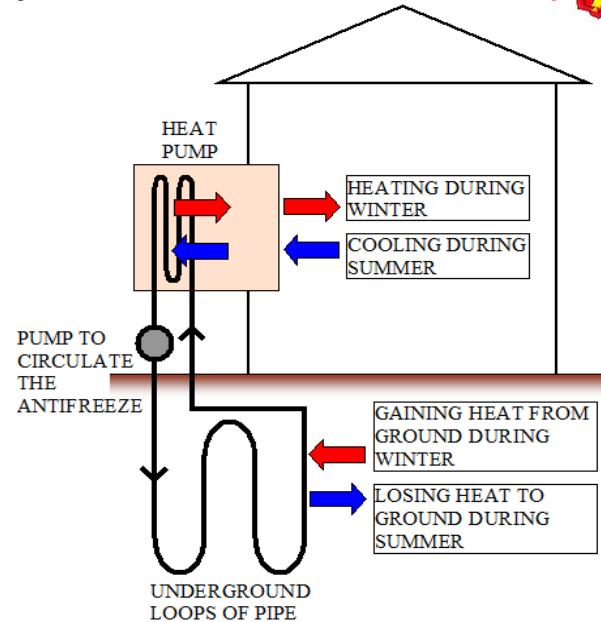




Residential Photovoltaic 10 SWA Units @ Wicozani Subdivision



Wicozani Subdivision Ring Thunder Housing			
GSHP closed loop			
Srv Loc #	Account	Yr KW Usege	Ave KW Mth Use
10350	203879	19,403	1,617
10351	203880	29,580	2,465
10352	203881	17,113	1,426
10349	203878	25,806	2,150
10343	203872	30,741	2,562
10344	203873	15,006	1,250
10345	203874	19,885	1,657
10346	203875	20,051	1,671
10347	203876	19,222	1,602
10348	203877	23,235	1,936
Total		220,042	18,336
Hs Ave/yr		22004.2	1,833.6 Hs Ave/month

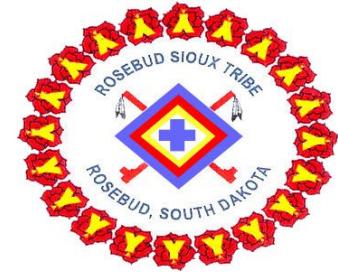


Ground Source Heat Pump, closed loop system, designed to extract heat in winter from the earth via the glycol water solution that circulates through the loop continuously and in the summer it extracts heat from the interior of the building and spills the heat in the earth, consistently producing domestic hot water, through excess heat during the whole process.



RST Solar Energy Partnership Initiative

Solar Power Payback Period



COMPUTATION BASIS

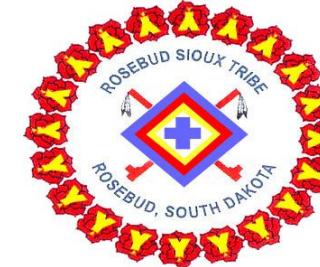
- According to pv watts, 5.0 Peak sun hours per day
- $5.0 \text{ hours} \times 5.83 \text{ kW} = 29.15 \text{ kWhr}$ per day per house
- $29.15 \text{ kWhr} \times 365 \text{ days} \times 80\% \text{ Real Solar Conditions} =$
 8511.8 kWhr per year/per house
- $8,511.8 \text{ kWhr} \times 10 \text{ houses} = 85,118 \text{ kWhr}$ Amount produced by 10 Houses
- $85,118 \text{ kWhr} \times \$.101 = \$8,597$ Cost for 10 Houses in fall 2016

<u>Year</u>	<u>Savings/year</u>	<u>Cum/savings</u>
1	\$ 8,597	\$ 8,597
2	\$ 8,597	\$ 17,194
3	\$ 8,597	\$ 25,791
4	\$ 8,597	\$ 34,388
5	\$ 8,597	\$ 42,985
6	\$ 8,597	\$ 51,582
7	\$ 8,597	\$ 60,179
8	\$ 8,597	\$ 68,766
9	\$ 8,597	\$ 77,373
10	\$ 8,597	\$ 85,970

Pay back of SWA contribution is approx. 6 years.



Solar Energy Partnership Initiative



- **Targeted 10 SWA Rental Units** at Wicozani Subdivision, Ring Thunder, units are all electric heating and cooling, ground source closed loop systems.
- **\$183,540.00 = 10 units@\$18,354.00 Solar Equipment, Installation & Initial Training.**
 - SWA and GRID Alternatives share match requirements
 - SWA and SGU Building trades gaining training and building capacity
- **Provides Solar Power Systems** for residential needs - light/heat/cooling.
 - Individual 5.83 kW roof mounted photovoltaic panel systems
 - Grid Interactive – primary power solar; grid secondary.
 - Reimbursed for excess produced power at \$.05 kwh



Overall production of ten systems is 8.52MWh or 8,520 since install begin, 9.15.16 -11.14.16

Status	Name	Groups	City	State/Prov	Today	Lifetime	Connection
All	Name	Tribal	City	SD	Today	Lifetime	All
<input checked="" type="checkbox"/> Normal	2509 Wicozani Drive, Rosebud Sd	Tribal	Rosebud	SD	551 Wh	1.15 MWh	Cellular
<input checked="" type="checkbox"/> Normal	2511 Wicozani Drive Rosebud, SD	Tribal	Rosebud	SD	0 Wh	897 kWh	Cellular
<input checked="" type="checkbox"/> Normal	2512 Wicozani Drive Rosebud, SD	Tribal	Rosebud	SD	0 Wh	1.79 MWh	Cellular
<input checked="" type="checkbox"/> Normal	2514 Wicozani Drive Rosebud, SD	Tribal	Rosebud	SD	0 Wh	869 kWh	Cellular
<input checked="" type="checkbox"/> Normal	2515 Wicozani Drive Rosebud, SD	Tribal	Rosebud	SD	8 Wh	845 kWh	Cellular
! Envoy Not Reporting	2516 Wicozani Drive	Tribal	Rosebud	SD	0 Wh	346 Wh	Cellular
! Envoy Not Reporting	2517 Wicozani Drive	Tribal	Rosebud	SD	0 Wh	1.35 kWh	Cellular
! Envoy Not Reporting	2518 Wicozani Drive	Tribal	Rosebud	SD	0 Wh	4.52 kWh	Cellular
<input checked="" type="checkbox"/> Normal	Rosebud Housing Authority - 2510 Wicozani Drive	Tribal	Rosebud	SD	0 Wh	1.14 MWh	Cellular
<input checked="" type="checkbox"/> Normal	Rosebud Housing Authority - 2513 Wicozani Drive	Tribal	Rosebud	SD	0 Wh	1.82 MWh	Cellular



Filtered Systems

Energy

Today
559 Wh

Past 7 Days
972 kWh

Month To Date
2.26 MWh

Lifetime
8.52 MWh

systems_list (2).csv

systems_list (1).csv

Show all



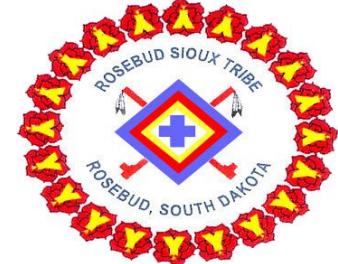
systems_list (2).csv ...



Enphase Energy - E...



10:30
11/15/...

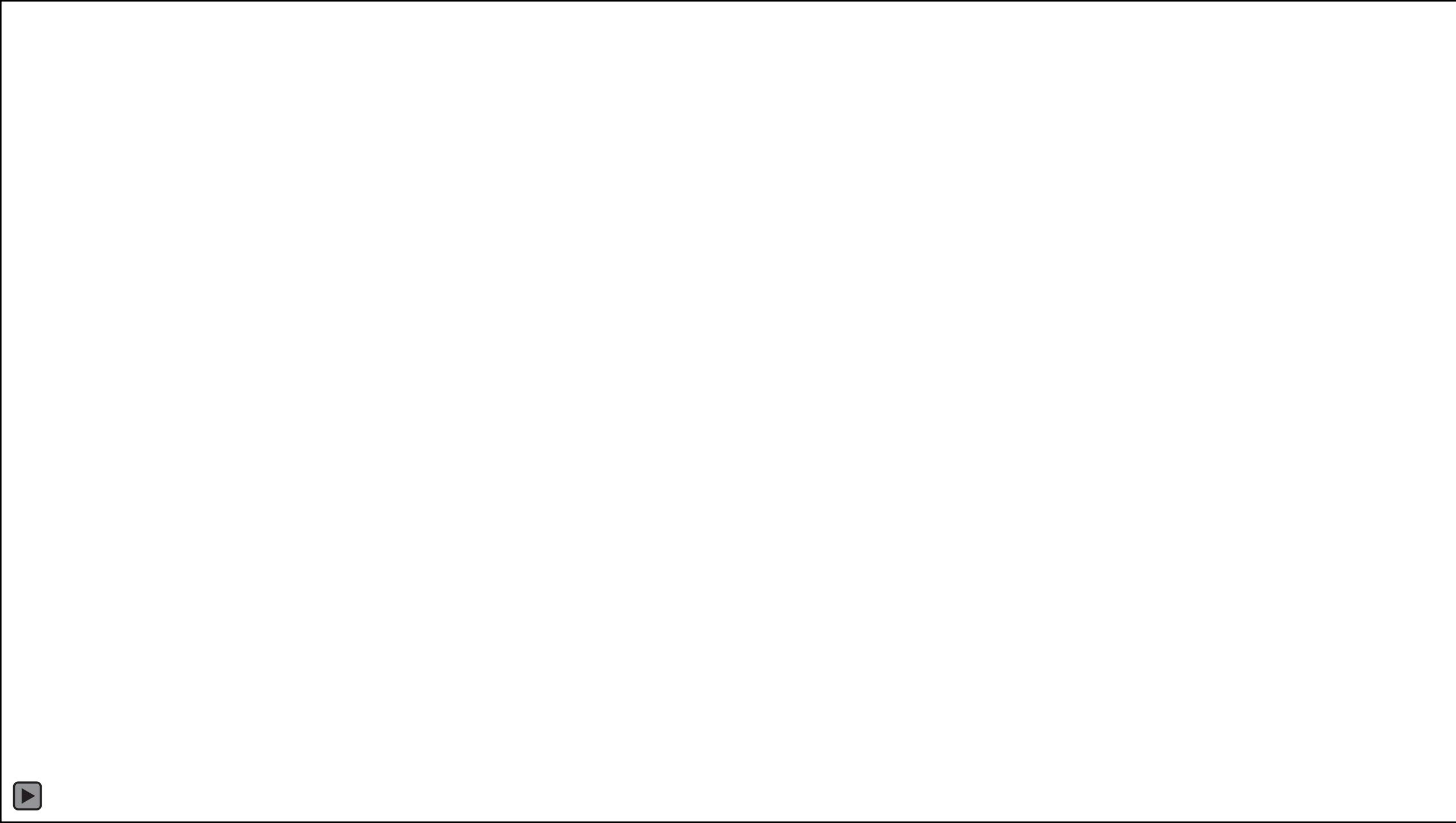


Price of electricity through Cherry-Todd for residential units is \$27.00 basic charge to be hooked up to the grid.

1st 900 kWhs are @10.182 cents per kWh, over 900, rate is 8.123 cents cents per kWhs.

Total production on 7 units,
since 9/15/2016 to 11/1/2016, 8.52MWh or 8520
kWhs @10.182 per kwh =
\$867.34, value of total production.
\$867.34/10 units = \$86.73





Monthly Energy Production Report

2509 Wicozani Drive, Rosebud Sd

Rosebud, SD

This report provides energy production for October.

Ave. kWhs per month is 1833, from slide
11

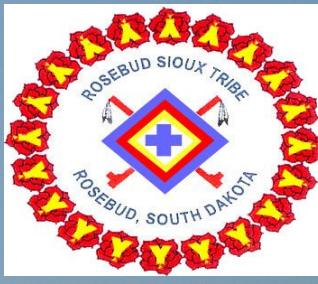
Actual production 718.8 kWhs

$719/1833=.392144$

At this early stage, it appears, we are replacing approx. 40% of the units average electrical need.

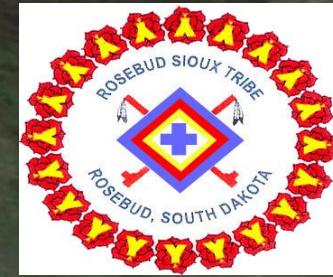
What we don't know is, what the unit is actually using and what is going up on the grid.

10/01/2016 - 10/07/2016	4,880 Wh	156.32 kWh
10/08/2016 - 10/14/2016	4,756 Wh	185.89 kWh
10/15/2016 - 10/21/2016	4,668 Wh	160.05 kWh
10/22/2016 - 10/28/2016	4,400 Wh	157.96 kWh
10/29/2016 - 10/31/2016	4,072 Wh	37.63 kWh
October 2016 Total:		718.83 kWh
Previous Month Total:		141.70 kWh
Year to Date:		842.07 kWh





Next Steps, Sicangu Village Estates



250 - 350kW tracking solar field...

Google Earth

Questions?

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