



*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*

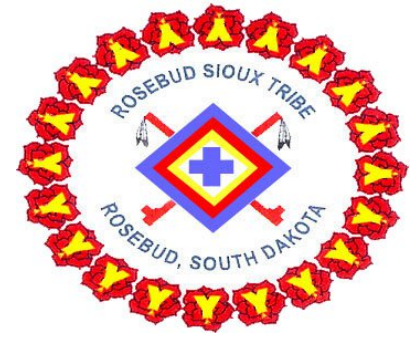
*I know now what this meant, that the bison were the gift of a good spirit and were our strength, but we should lose them, and from the same good spirit we must find another strength.*

**Black Elk speaks, 1932**





# Strategic Energy Planning for Tribal Governments



Why?

*Take charge of our tribes energy future?*

*Become energy independent?*

*Save Money?*

*Build business's?*

*Build the local economy?*

*Self reliance?*



# Global Warming and Climate Change

**Climate change is the most profound challenge of our time. Its effects are long lasting and so significant they even endanger humankind.**

**Human activity is now spilling 10 billion tons of carbon in the atmosphere annually.**

**This release of carbon outpaces carbon release during the most extreme global warming event of the past 66 million years by at least an order of a magnitude. That event was called the Palaeocene-Eocene Thermal Maximum or PETM.**





# What can we do?

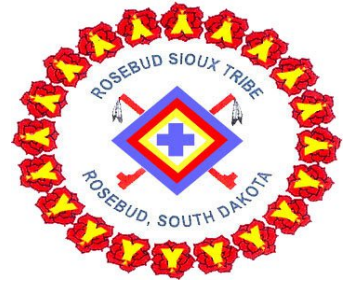
**FACT! 2015 is now the warmest year in the instrumental record, and Feb. 2016 made the record of being the warmest Feb. on record.**

Earth's average temperature has already risen by 1.6°F since the beginning of the 20th century, and [is expected to rise](#) another 0.5°F to 9°F by 2100, according to the [Intergovernmental Panel on Climate Change](#), depending on greenhouse gas emissions.





## ***EPA Carbon Plan Will Cause Energy Prices to Soar***



**General News** - Nov 20, 2014

- **The U.S. Environmental Protection Agency's (EPA) proposed carbon rule is the latest in a series of regulations alongside rising natural gas prices that will increase the cost of electricity and natural gas by nearly \$300 billion in 2020 compared with 2012.**
- **The study found the typical household's annual electricity and natural gas bills would increase by \$680, or 35 percent, from 2012 compared to 2020, escalating each year thereafter as EPA regulations grow more stringent.**

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

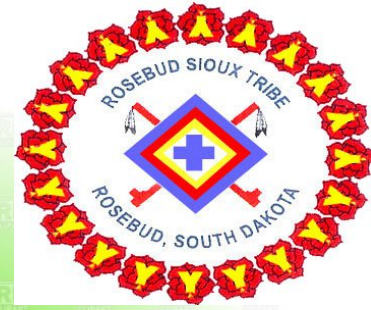


## Wholesale Rates Increases      Consumer Rate Increases

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

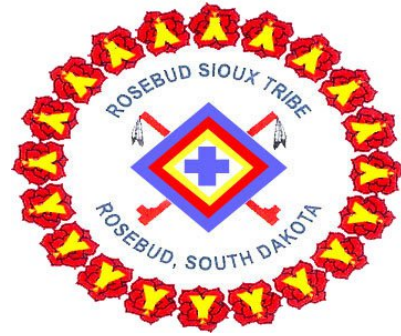


- 2003.....\$ 665,525.00
  - 2006.....\$ 954,997.00
  - 2013.....\$2,713,645.50
  - 2014.....\$2,578,311.68
  - 2015.....\$2,999,426.48
- 
- Federal LIHEAP assistance, annually is ~\$963,000.00 and is decreasing annually
  - Remaining monies supplied internally





# The Rosebud Sioux Tribe Strategic Energy Plan



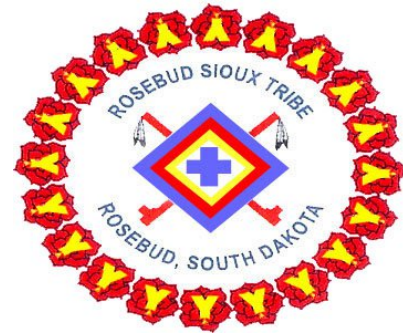
**An over-arching living document that will**

- **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.**





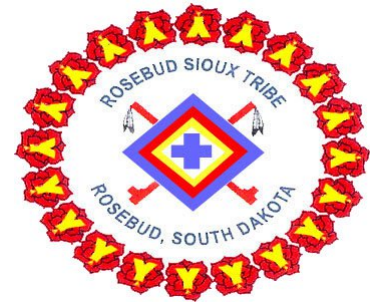
# The Rosebud Sioux Tribe Strategic Energy Plan



- Tribal Government to enact building and energy codes, laws and resolutions implementing and supporting this plan
- To place into effect energy conservation measures to lower the cost and waste of our declining federal and tribal resources.
- To incorporate renewable energy devices at the residential level or at community scale to produce energy locally for our needs
- To create self-sustainable businesses that will lessen the burden and the cost of “off reservation” generated electricity and fuels.



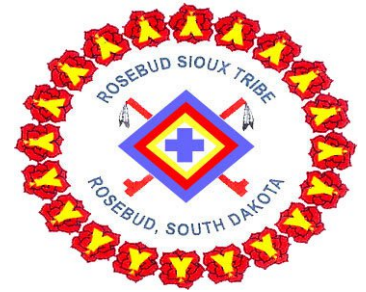
# The RST Strategic Energy Plan Initial Steps



- **Review and revise Draft Strategic Energy Plan under New Leadership Team**
- **Approve charter adopting RESCo, Rosebud Energy Services Company**
- **RESCo to initiate collection of ENERGY FOOTPRINT**
  1. **All LIHEAP recipients will permit this group to collect electrical use data from local utilities for last 2 years**
  2. **All Tribal Departments will permit this group to collect electrical and fuel use data**
  3. **Surveys to be sent out to request energy data use from all tribal members not using the LIHEAP services**



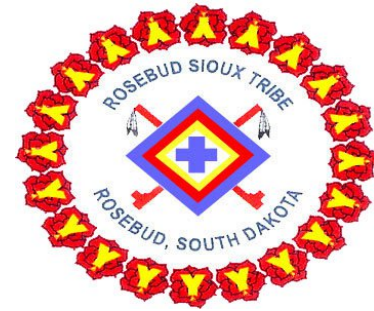
# Energy Audits Conservation



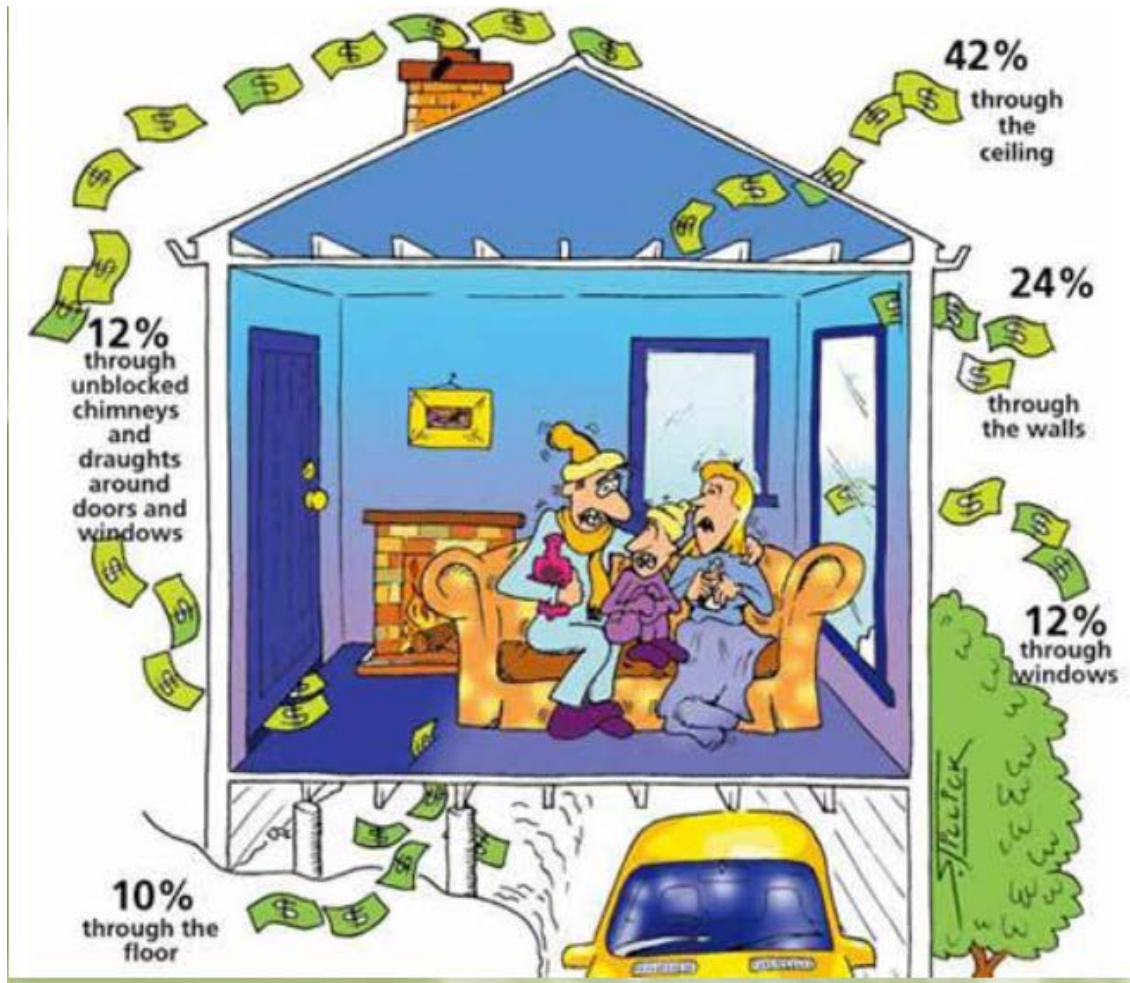
- **Initial actions and recommendations**
  1. **Target high energy use repeating LIHEAP recipients to a walk through energy inspections or full blown energy audits.**
  2. **All LIHEAP recipients will be required to attend to recommendations of energy inspections in 90 days or be subject to loss of tribally funded LIHEAP services**
  3. **If rental units, owners will become responsible for repairs, Examples: SWA or Sunrise Apartments**



# Energy Conservation



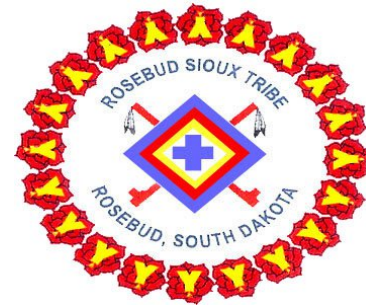
- Primary Step to lessen energy use and cost



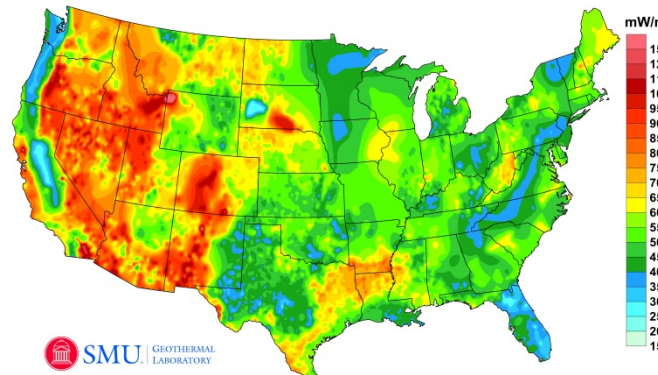
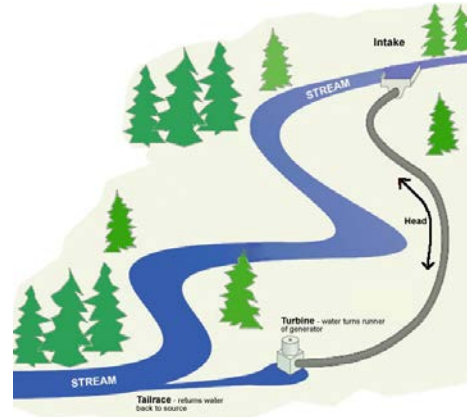




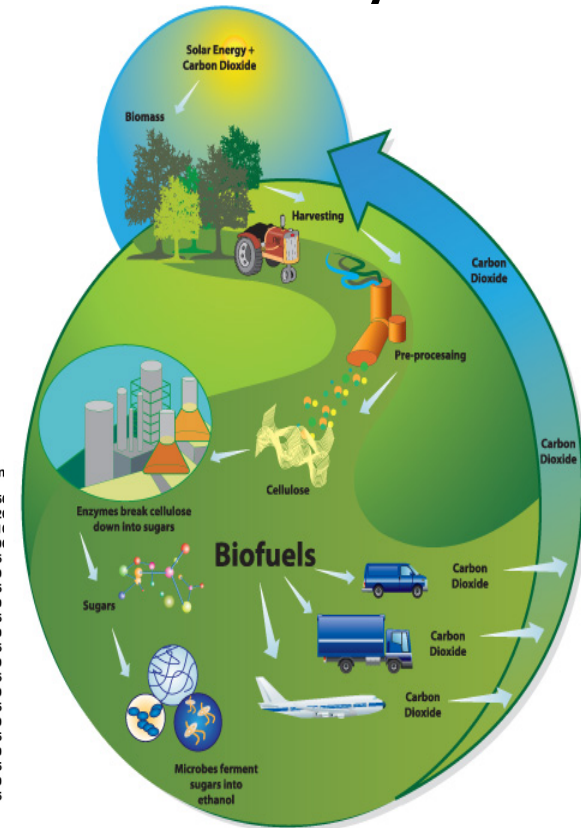
# Next Steps RST SEP



- Understanding our Local Renewable Resources and how to use them effectively and efficiently.



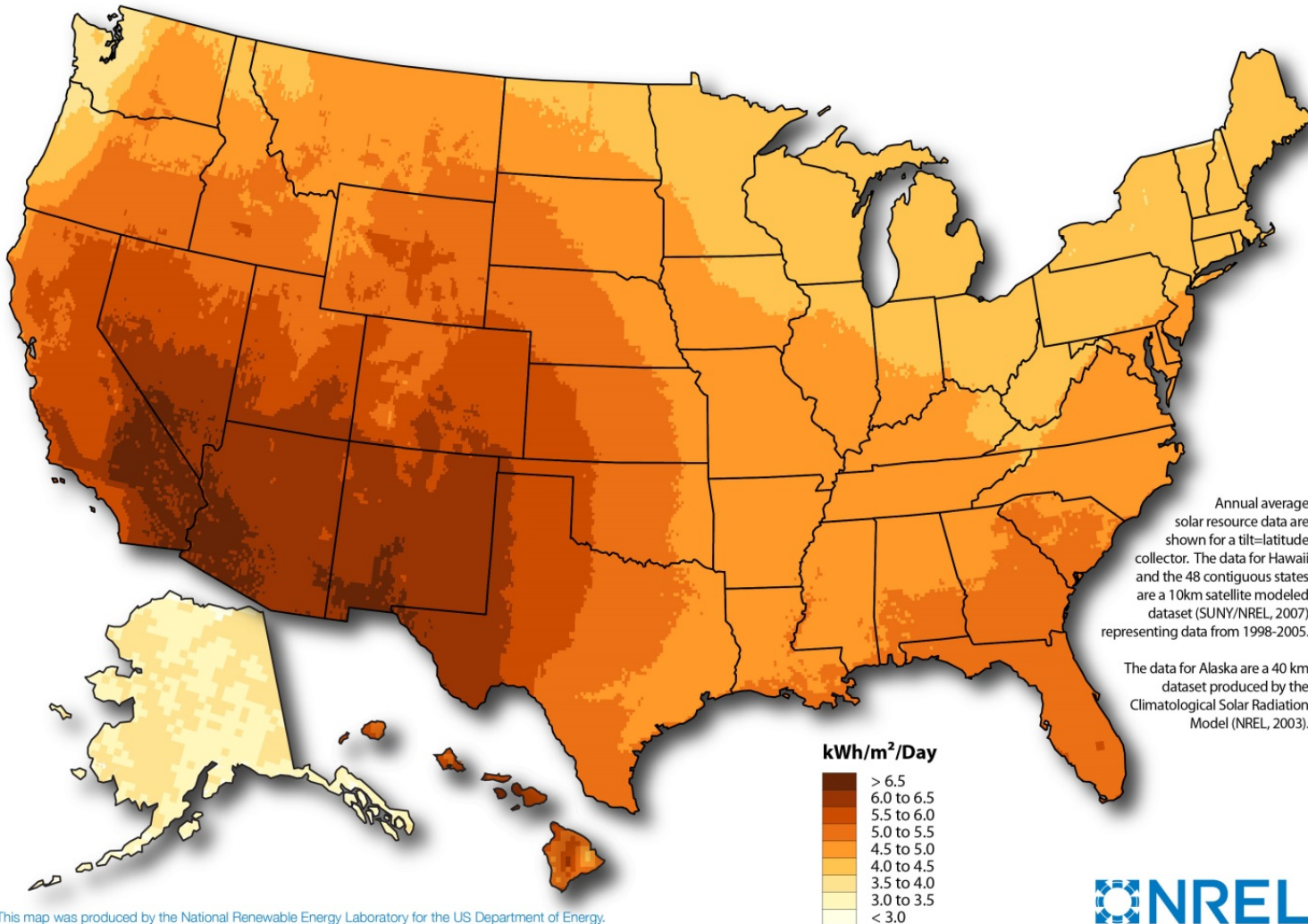
SMU GEOTHERMAL LABORATORY





# Residential Photovoltaic

## Photovoltaic Solar Resource of the United States



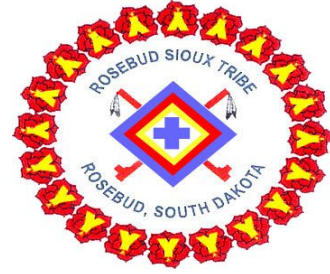
This map was produced by the National Renewable Energy Laboratory for the US Department of Energy.  
October 13, 2009 Author: Billy J. Roberts







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



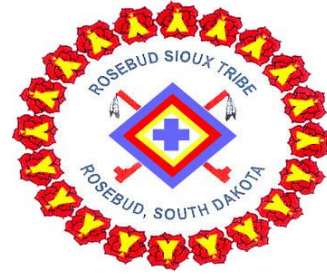
**10 SWA RENTAL UNITS  
WICOZANI SUBDIVISION  
RING THUNDER  
SOLAR ENERGY PARTNERSHIP INITIATIVE (SEPI)**

*Department of Energy, Office of Energy Efficiency & Renewable Energy*





# Solar Energy Partnership Initiative

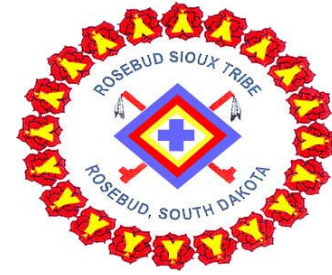


- **Targeted 10 SWA Rental Units** at Wicozani Subdivision, Ring Thunder, units are all electric heating and cooling, ground source closed loop systems.
- **\$205,339= 10 units@ \$20,534 Solar Equipment, Installation & Initial Training.**
  - SWA and GRID Alternatives will share match requirements
  - 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

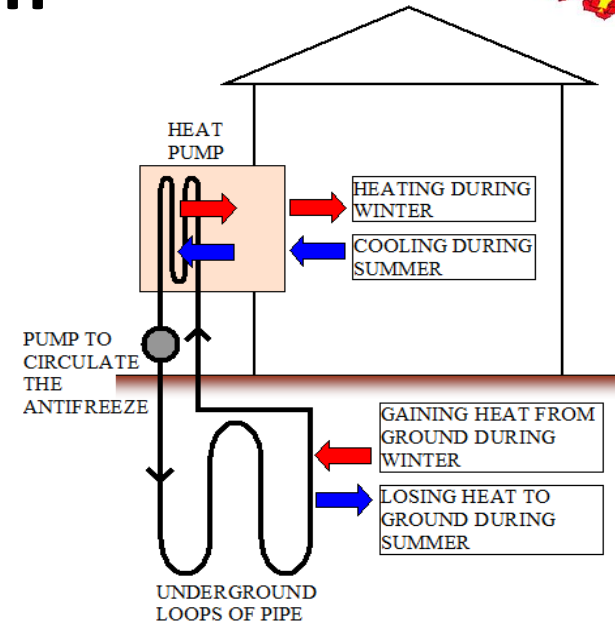




# Residential Photovoltaic 10 SWA Units @ Wicozani Subdivision



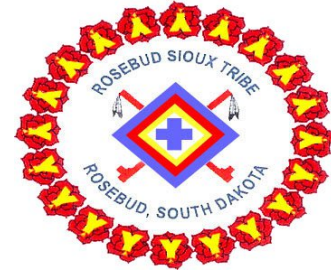
Wicozani Subdivision Ring Thunder Housing			GSHP closed loop		
Srv Loc #	Account	Yr KW Usege	Ave KW Mth Use		
10350	203879	19,403	1,617		
10351	203880	29,580	2,465		
10352	203881	17,113	1,426		
10349	203878	25,806	2,150		
10343	203872	30,741	2,562		
10344	203873	15,006	1,250		
10345	203874	19,885	1,657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

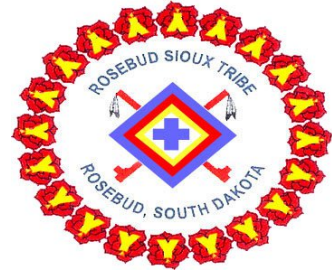
- According to pv watts, 5.0 Peak sun hours per day
- 5.0 hours X 5.83 kW = 29.15 kWhr per day per house
- 29.15 kWhr X 365 days X 80% Real Solar Conditions=  
8511.8 kWhr per year/per house
- 8,511.8 kWhr X 10 houses =85,118 kWhr Amount produced by 10 Houses
- 85,118 kWhr X \$ .104 = \$8,852 Cost for 10 Houses in fall 2016

<u>Year</u>	<u>Savings/year</u>	<u>Cum/savings</u>
1	\$ 8,852	\$ 8,852
2	\$ 8,852	\$ 17,704
3	\$ 8,852	\$ 26,556
4	\$ 8,852	\$ 35,408
5	\$ 8,852	\$ 44,260
6	\$ 8,852	\$ 53,112
7	\$ 8,852	\$ 62,964
8	\$ 8,852	\$ 70,816
9	\$ 8,852	\$ 79,668
10	\$ 8,852	\$ 88,520

Pay back if SWA matched dollars and grant was awarded, approx. 6 years.



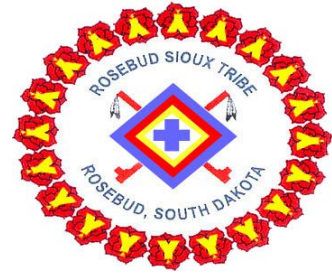
# Develop Businesses and Build Human Capacity



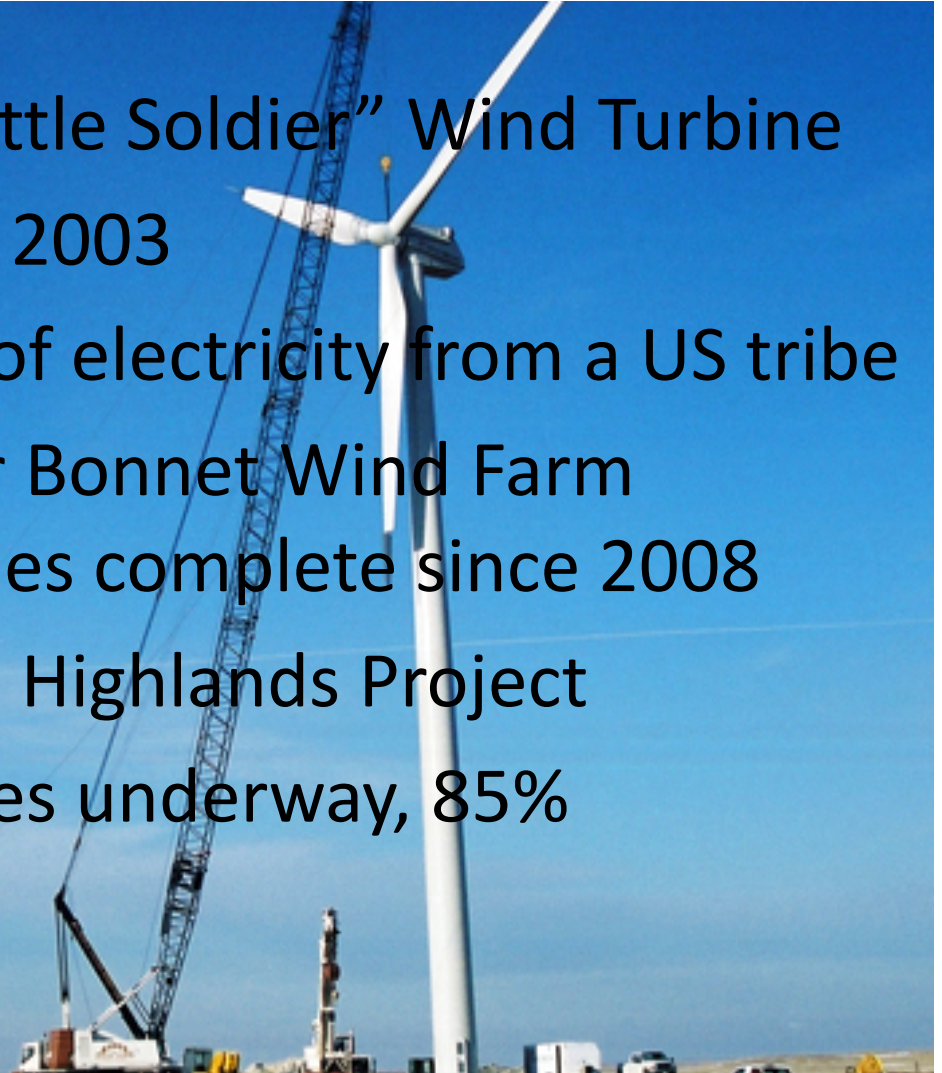
- Cost estimate was developed by Grid Alternatives on 5.83kw residential solar. \$20,534.00 each labor and installation.
- 5.83kw systems can be found on line to cost out about ~\$8-9,000.00 for kits.
- Develop and train Local electricians how to set up and install these residential solar systems through SGU then RESCO to implement large scale.
- Repeat the same when developing residential or community scale Wind Turbines,
- Learn costs, learn systems, build Human Capacity, Jobs and businesses
- REDCO to develop these businesses, RESCO to maintain these services, Sinte Gleska University to teach and build capacity



# Commercial Grade Wind Development on the Rosebud



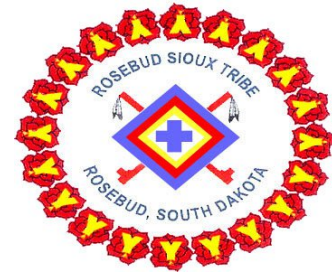
- 750 Kw Akicita Cikala “Little Soldier” Wind Turbine  
Commissioned March 2003  
First commercial sale of electricity from a US tribe
- 30 Mw Owl Feather War Bonnet Wind Farm  
Preconstruction Studies complete since 2008
- 190 Mw North Antelope Highlands Project  
Preconstruction Studies underway, 85%  
complete





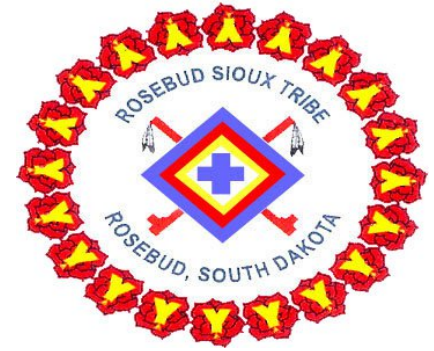


# Why an energy plan? For our Future Generations





# Rosebud Sioux Tribe Strategic Energy Plan



For more information:  
Tribal Utilities Commission

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

605-856-2727 or

Ken Haukaas, Commissioner

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

605-319-1427