U.S. Department of Energy: *Office of Indian Energy*

HO·CHUNK INCORPORATED

Deploying Clean Energy on the Winnebago Reservation

Winnebago Tribe Of Nebraska

- Located in northeast Nebraska near the tri-state area of Nebraska, Iowa, and South Dakota.
- The Winnebago Tribe of Nebraska has approximately 5,000 enrolled members.
- The reservation is 116,000 acres.
- Allotted reservation - there are 30,000 acres that is controlled by the Tribe.

Winnebago Tribe Of Nebraska

- The Treaty of 1865 relocated from Wisconsin are to the current reservation.
- There are nine members of the Tribal Council that serve a staggered three terms.
- Officers serve a one year term.
- IHS Facility
- Tribal College
- Educare
- Ho-Chunk Community Development Corporation
- Ho Chunk, Inc

Ho-Chunk, Inc.

Established in 1994 in Winnebago, Nebraska with one employee, Ho-Chunk, Inc. has grown to over 1,000 employees with operations in 24 states and 10 foreign countries.

Ho-Chunk, Inc.

- The board of directors consist of five members with two of them being council members.
- Ho-Chunk, Inc. has a focus on economic development.
- Early businesses were common tribal economic ventures such as tobacco and gas.
- Later was expanded to hotels and interest in modular home company.
- There has been major growth with 8a contracting.

Ho-Chunk, Inc.

- With growth, there was an increased need for community and social programs from Ho-Chunk, Inc.
- Housing initiatives, education initiatives, financial literacy.
- Leadership – Renewable Energy

“In Order to do one thing you have to do everything.”

– Lance Morgan, Ho-Chunk, Inc. President and CEO

Lessons Learned

Started with wind investments

- Didn't qualify for tax credits.
- Grants helped offset the cost.
- Commercial scale sold for ~2.9 cents KW, brought back at ~10 cents KW.
- High maintenance costs

Shift to solar investments

- Started with small projects.
- Grants helped offset the cost.
- Focus on offsetting coast on retail power.
- Low maintenance costs.
- Nebraska has very good solar resources

Lessons Learned

Planning and Engagement

- More and better communication with all stakeholders is key
- Use technology and social media to inform members
- Don’t forget old school use of flyers and newsletters
- Always, always, always include the Tribal Council.

Mechanics and Construction

- Keep projects simple as possible
- Know interconnection policy and economics
- Keep a ‘low profile’
- Protect from traffic, if it’s possible, they’ll hit it.
- Managing contractors and budgets
- Further development of ‘rightsizing’ capability

Project Highlights DOE -2

Ho-Chunk, Inc. is helping create one of the largest renewable energy infrastructures in the state of Nebraska in the Winnebago community.

This project follows on the heels of a 1,000 panel retail offset project (Topic 2) in 2018, DOE 1.

HIGHLIGHTS

- 900 solar panels installed at 9 sites across the Winnebago Community.
- 280kw solar power generation, reducing energy bills by about $40-46,000 annually.
- These projects will offset 455 MWh at the sites annually and offset significant retail consumption.

Funding DOE -2

In 2018, Ho-Chunk, Inc. and the Winnebago Tribe made an investment of over $700,000 in renewable energy with the support of U.S. Department of Energy, Office of Indian Energy

$728,600

BREAKDOWN

$364,300 in grants from the Office of Indian Energy at the Department of Energy

$364,300 in matching funds from Tribal sources, including Ho-Chunk, Inc.

Project Sites

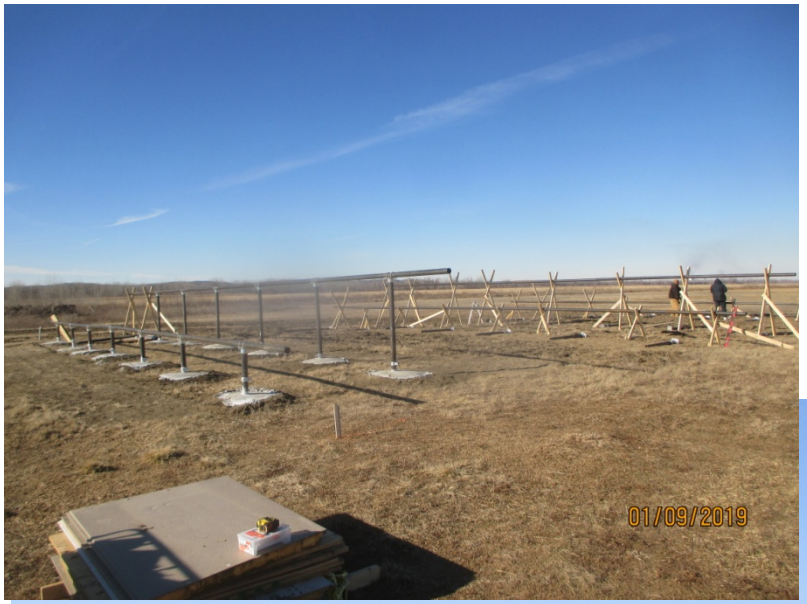
Renewable energy project sites include:

- Solar panels
  - 50kW Pony Express Fuel Station at Winnavegas Casino
  - 23kW Pony Express Fuel Station in Rosalie, NE
  - 8kW HCI Accounting in Winnebago
  - 50kW Blackhawk Community Center in Winnebago
  - 50kW at Winnavegas Casino
  - 50kW at Winnavegas Hotel
  - 8kW at Winnavegas North Amphitheater
  - 15kW at the Winnavegas RV Park
  - 25kW at the Winnavegas Training Center

  - Total 280kW

Winnavegas Pony Express

- Significant offset
- Cost effective
- Looks great!
- Out of traffic
- $2.30/watt installed cost
- Long electrical run


01/09/2019


28/04/2019


06/06/2019

Pony Express Rosalie

- First use of MPM mounting system
- Utilized property edge with a north/south spine
- Traffic bollards became necessary because of traffic
- Excellent production
- $3.25/watt installed cost


04/06/2019


TRUCK STOP

HCI Accounting

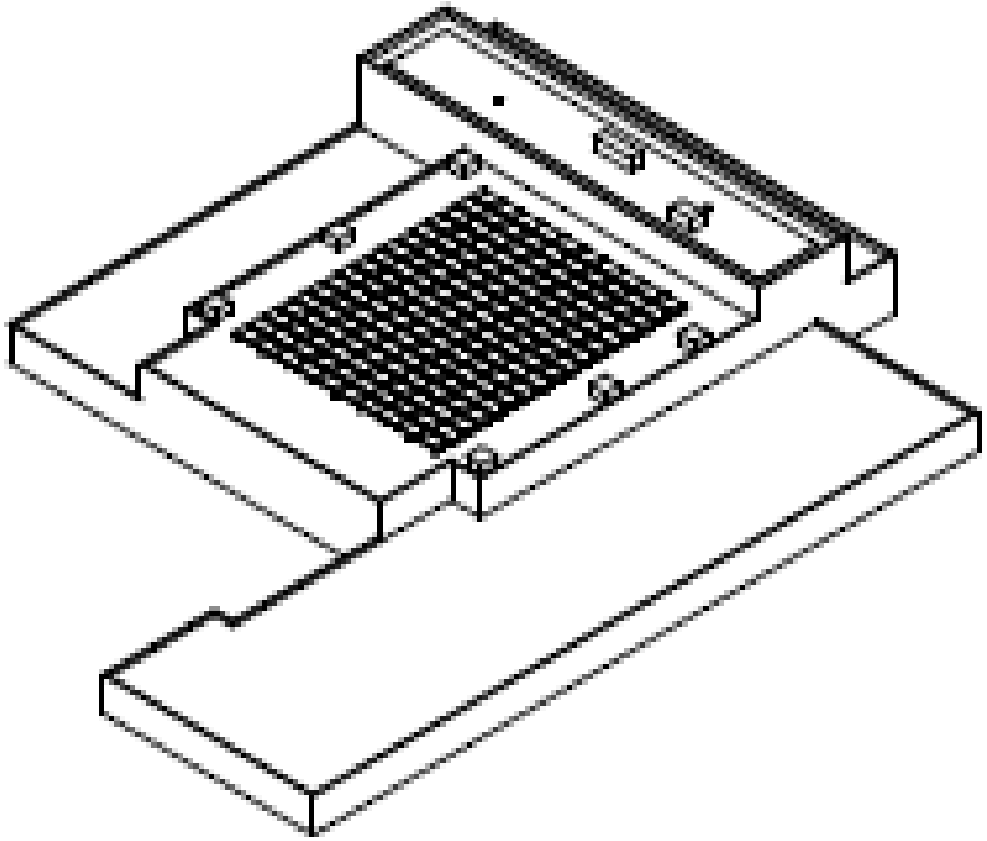
- Already had a skystream on this meter to make a hybrid system
- All electric building
- Pole mounts well adapted to sloped ground
- $3.65/watt installed cost


08/07/2019


09/07/2019

Blackhawk Community Center

- Difficult design burden
- Open area, excellent solar access
- Load analysis completed
- Attached system using power grip anchors
- $2.40/watt installed cost



100kW Winnavegas Casino + Hotel

- Standing seam metal roof, quickly deployed
- Open solar access
- $1.85/watt installed cost
- Performed roof loading study


11/27/2018


11/29/2018


12/17/2018

7.6kW Amphitheater North

- Located with RV Park in small available area
- 17’ long pipe with ten foot in the ground with concrete
- Very high power cost
- $3.65/watt installed cost

15 kW RV Park

- Pole Mounts selected because of limited space available
- Will provide sustainable energy for camping visitors
- Replaces expensive power
- $$3.31/watt installed cost

25kW Winnavegas Training Center

- Utilize unused space for energy offset
- Designed to expand
- 25kW inverter capacity
- $2.20/watt installed cost

Winnavegas Site Planning

DOE-2 Overview

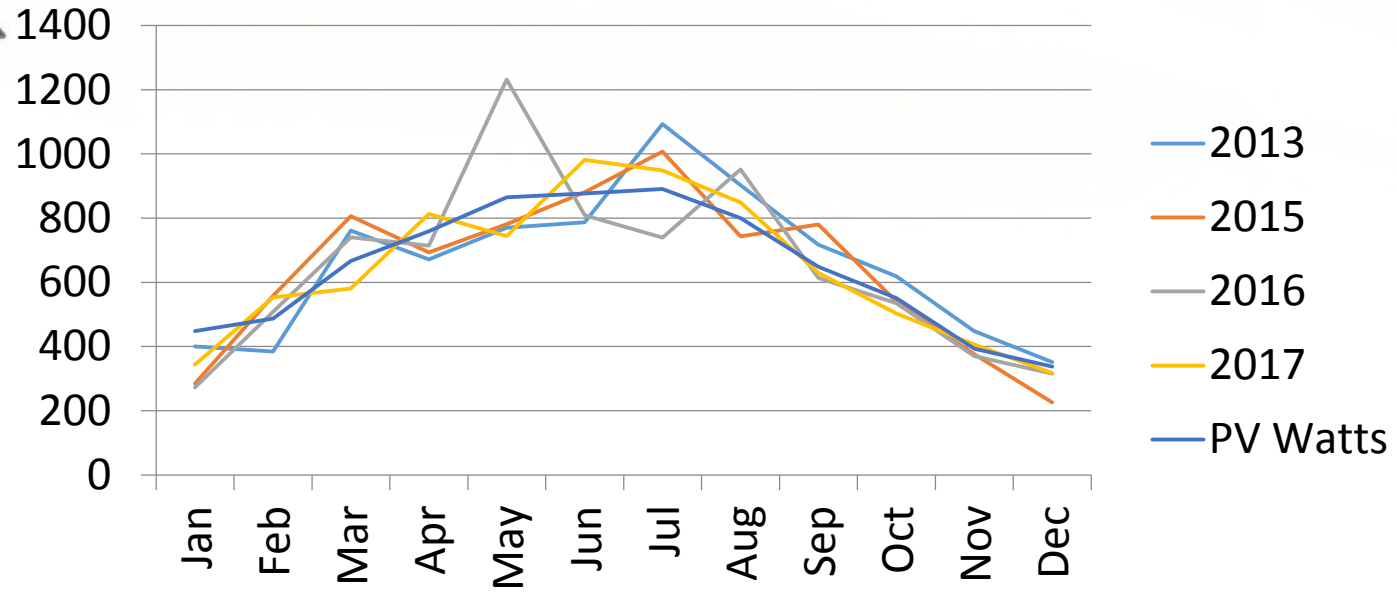
Annual Analysis	Suggested		Produced	value								
Location	**AC kW**	**DC kW**	**MWh**	**$/MWh**	**Value**	**Installed $**	**$/watt**	**Usage/yr**	**Match**	**IRR %**	**Payback**	**Type**
Pony Sloan	50	58	80	$116.00	$ 9,280.00	$ 121,974.00	$2.10	102 Mwh	HCI			Ground
Pony Rosalie	23	25	38	$110.00	$ 4,180.00	$ 81,250.00	$3.25	128 MWh	HCI			Pole
HCI Accounting	7.6	8.4	12	$100.00	$ 1,200.00	$ 30,622.00	$3.65	80 MWh	HCI			Pole
BHCC	50	58	89	$ 81.00	$ 7,209.00	$ 129,997.00	$2.24	1,086 MWh	Tribe			Roof
Casino	50	58	80	$ 88.00	$ 7,040.00	$ 107,133.00	$1.85	5,131 MWh	Casino			S-5 Roof
Hotel	50	58	80	$ 94.00	$ 7,520.00	$ 105,122.00	$1.81	1,528 MWh	Casino			S-5 Roof
Amphitheater N	7.6	8.4	12	$260.00	$ 3,120.00	$ 30,622.00	$3.65	14 MWh	Casino			Pole
Sign/RV park	15	16.8	24	$115.00	$ 2,760.00	$ 55,744.00	$3.31	61 Mwh	Casino			Pole
Training Center	25	29	40	$115.00	$ 4,600.00	$ 66,158.00	$2.28	106 Mwh	Casino			Ground
Totals/Average	278	320	455	$120.00	$46,909.00	$ 728,622.00	$2.69	8,236 MWh		7.20%	12.6yrs @ 3%	
Summary Figures											15.5 simple	

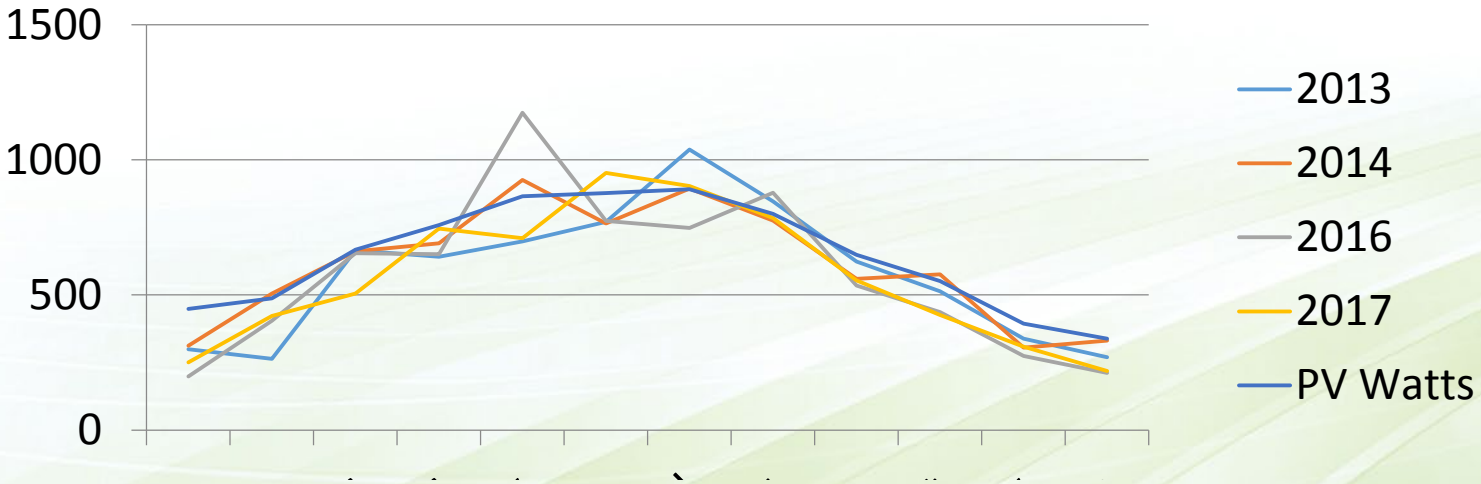
Project Status

Location	AC kW	Status	Electrical status	Savings to date
Pony Sloan	50	Installed	Completed, online	$2,800.00
Pony Rosalie	23	Installed	Completed, online	$325.00
HCI Accounting	7.6	Installed	Completed, online	$120.00
Blackhawk	50	Installed	Completed, online	$0.00
WV Casino	50	Installed	Completed, online	$4,200.00
WV Hotel	50	Installed	Completed, online	$4,200.00
WV Amph North	7.6	Installed	Completed, online	$450.00
WV RV Park	15	Installed	Completed, online	$750.00
WV Training Ctr	25	Installed	Completed, online	$1,100.00
	278			

* As of Nov 19, not all system on line Jan 1, 2018

Power Estimation

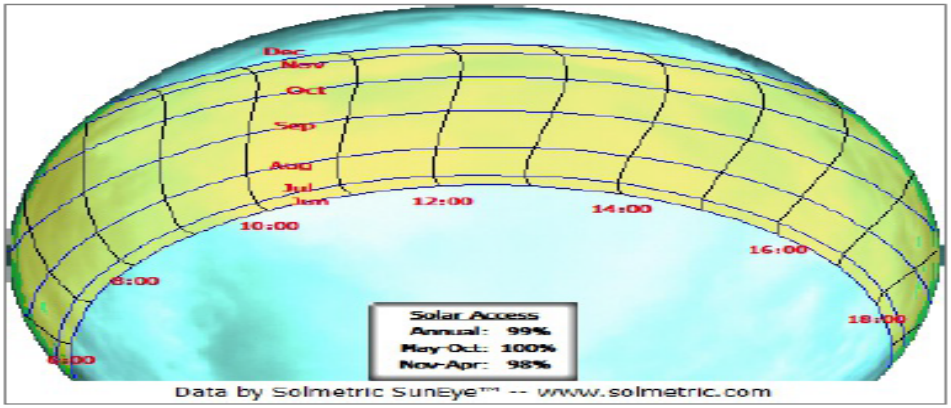


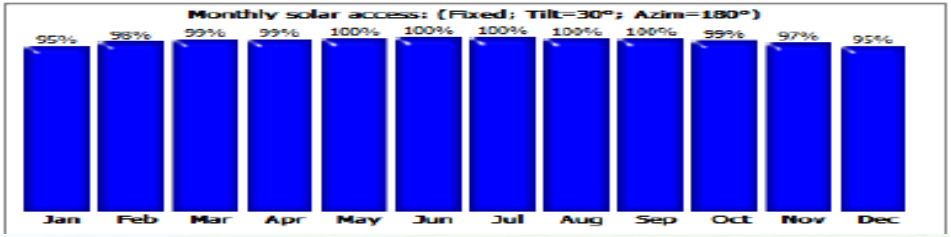


Resource Verification

Sky01 -- 3/23/2018 3:09 -- pony express site

Panel Orientation: Tilt=30° -- Azimuth=180° -- **Skyline Heading=181**
Solar Access: Annual: 99% -- Summer (May-Oct): 100% -- Winter (No
TSRF: 98% -- **TOF:** 99%





Resource Verification is clearly shown with modern solar camera devices. Solar access must be verified to ensure year round access to the solar resource.

Future Plans

- ✓ Continue clean energy projects in Ho-Chunk Village.
- ✓ Develop clean energy strategies in the development of Ho-Chunk Village 2.0
- ✓ Explore outside partnership efforts (investors, tax credit leveraging, etc.)

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