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

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.
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.
- Know your interconnection policy!
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.
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.

**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
  - 25kW 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
  - 25kW at the Health and Human Services building

- Total 280kW
Winnavegas Pony Express

- Significant offset
- Cost effective
- Looks great!
- Out of traffic
- $2.30/watt installed cost
- Long electrical run
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
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
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
25kW DHHS Building

- Standing seam metal roof
- Concentrated on south end
- $2.00/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
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

<table>
<thead>
<tr>
<th>Location</th>
<th>AC kW</th>
<th>DC kW</th>
<th>MWh</th>
<th>$/MWh</th>
<th>Value</th>
<th>Installed $</th>
<th>$/watt</th>
<th>Usage/yr</th>
<th>Match</th>
<th>IRR %</th>
<th>Payback Type</th>
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<tbody>
<tr>
<td>Pony Sloan</td>
<td>50</td>
<td>58</td>
<td>80</td>
<td>$116.00</td>
<td>$9,280.00</td>
<td>$121,974.00</td>
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<td>102 MWh</td>
<td>HCI</td>
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<td>Ground</td>
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<tr>
<td>Pony Rosalie</td>
<td>23</td>
<td>25</td>
<td>38</td>
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<td>128 MWh</td>
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<td>HCI Accounting</td>
<td>7.6</td>
<td>8.4</td>
<td>12</td>
<td>$100.00</td>
<td>$1,200.00</td>
<td>$30,622.00</td>
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<td>80 MWh</td>
<td>HCI</td>
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<td>BHCC</td>
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<td>89</td>
<td>$81.00</td>
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<td>1,086 MWh Tribe</td>
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<tr>
<td>Casino</td>
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<td>80</td>
<td>$88.00</td>
<td>$7,040.00</td>
<td>$107,133.00</td>
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<td>5,131 MWh Casino</td>
<td>S-5 Roof</td>
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<td>Hotel</td>
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<td>80</td>
<td>$94.00</td>
<td>$7,520.00</td>
<td>$105,122.00</td>
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<td>1,528 MWh Casino</td>
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<tr>
<td>Amphitheater N</td>
<td>7.6</td>
<td>8.4</td>
<td>12</td>
<td>$260.00</td>
<td>$3,120.00</td>
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<td>$3.65</td>
<td>14 MWh</td>
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<tr>
<td>Sign/RV park</td>
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<td>8</td>
<td>24</td>
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<td>61 Mwh</td>
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<td>Training Center</td>
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<td>Casino</td>
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<td><strong>Totals/Average</strong></td>
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<td>320</td>
<td><strong>455</strong></td>
<td>$120.00</td>
<td><strong>$46,909.00</strong></td>
<td><strong>$728,622.00</strong></td>
<td><strong>$2.69</strong></td>
<td><strong>8,236 MWh</strong></td>
<td>7.20%</td>
<td>12.6yrs @ 3%</td>
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### Summary Figures

- 15.5 simple
## Project Status Dec 20

<table>
<thead>
<tr>
<th>Location</th>
<th>AC kW</th>
<th>Status</th>
<th>Electrical status</th>
<th>Savings to date</th>
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<tbody>
<tr>
<td>Pony Sloan</td>
<td>50</td>
<td>Installed</td>
<td>Completed, online</td>
<td>$10,100.00</td>
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<tr>
<td>Pony Rosalie</td>
<td>23</td>
<td>Installed</td>
<td>Completed, online</td>
<td>$3,420.00</td>
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<tr>
<td>HCl Accounting</td>
<td>7.6</td>
<td>Installed</td>
<td>Completed, online</td>
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<td>Blackhawk</td>
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<tr>
<td>WV Hotel</td>
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<td>Installed</td>
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<td>WV Amph North</td>
<td>7.6</td>
<td>Installed</td>
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<td>$2,400.00</td>
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<td>WV RV Park</td>
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<td>Installed</td>
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<td>WV Training Ctr</td>
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<td><strong>Total, 1st year</strong></td>
<td>278</td>
<td>Total</td>
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<td><strong>$49,648.00</strong></td>
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<td><strong>Annual goal</strong></td>
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<td><strong>$47,000.00</strong></td>
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</table>
Challenges overcome

✓ Unclear property lines caused extra work at a Winnavegas casino site.

✓ Winter weather

✓ Utility refusal to allow any onsite offset that exceeded 25kW, though allowed by law.
Future Plans

✓ Explore Tribal Sovereignty approach to restrictive limits and quotas

✓ Develop clean energy strategies in the development of Ho-Chunk Village 2.0

✓ Explore outside partnership efforts (investors, tax credit leveraging, etc.)
Contact Information

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