Office of Indian Energy
Annual Program Review
2021 Zoom Meeting

Assiniboine & Sioux Tribes of the Fort Peck Indian Reservation
Fort Peck Wellness Center
Energy Project
Poplar, Montana
Fort Peck Indian Reservation

- Assiniboine & Sioux
- 11,000 members
- 6700 live on Reservation

- NE Montana
- 2.1 Million Acres
- Checkerboard Land Pattern
Fort Peck Wellness Center

- Multi disciplinary Wellness/Activity Center
- Initiated in 2012 by Health Promotion Disease Prevention Program
- Established CAT (Construction Advisory Team) in October 2018, intratribal, multidisciplinary
CAT Team

- Planning Office – 2 Representatives
- Tribes’ Secretary Accountant
- Environmental Office – 1 Rep
- Legal Representation – 2 Reps
- Health Prevention Staff - 6 Reps
- Road Department – 1 Rep
- Minerals – 1 Rep
CAT Deliverables

- Secured Civil Engineering services
- Advertised and selected Architectural Firm
- Reviewed funding options
- Established footprint of building
- Determined appropriate amenities
- Supported Green infrastructure options including DOE Grant
- Secures Tribal Executive Board support through information sharing including public outreach
Past Related Activities

“Model Green Tribal Community” – FPT Strategic Plan

- Ground source heat pumps (GSHP) – Adult Correctional Facility & 8 tribal homes
- Rehab Cultural Center for increased insulation and lighting efficiency
- GSHP and EE lighting installed on Phase III Tribal HQs and new Community Center
- Sustainable Village
Project Objectives:
• Objective 1: Install 72-78 kW of roof mounted solar Photo Voltaic System by the end of the 21st month
• Objective 2: Reduce utility bills by approximately 23% per year through installing 8 Building Energy Efficiency Measures (EEM’s) by the end of the 21st month

Baseline Assumptions, IECC 2012 compliant building:
• Electric Usage: Approximately 900,000 kWh per year
• Natural Gas Usage: 65,262 therms per year (based on package VAV system)
• Total expected utility cost - $108,690.00 per year

Energy Saving Expectations:
• Solar PV Arrays – operating cost savings - $5,991.00
• 8 accepted building envelope, lighting, & VAV HVAC EEM’s - $25,570.00 per year
• Total expected utility cost savings - $31,561.00 per year = 29% annual reduction
A detailed energy Simulation model was developed using eQuest (DOE 2.2) software.

Energy Savings:
- EEM’s – 15 options considered and modeled
- EEM’s – 8 options selected based on payback time frames
# Fort Peck Wellness Center

## EEM List and Energy Cost Savings Results

<table>
<thead>
<tr>
<th>Item</th>
<th>Energy Efficiency Measure</th>
<th>Details</th>
<th>Energy Cost Savings per year</th>
<th>Cost Of Item (Baseline - EEM Cost)</th>
<th>Payback (Years)</th>
<th>EEM Accepted?</th>
<th>Reasoning for Acceptance or rejection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Building Envelope and Lighting Components EEM Analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E2</td>
<td>Improved Wall R value</td>
<td>IECC 2012 Code minimum vs. architectural wall of R-31.6</td>
<td>$1,009.00</td>
<td>$134,555.00</td>
<td>133</td>
<td>No</td>
<td>Poor payback</td>
</tr>
<tr>
<td>E4</td>
<td>Improved Roof R Value</td>
<td>IECC 2012 Code minimum vs. architectural roofof R-41.3</td>
<td>$592.00</td>
<td>$89,970.00</td>
<td>152</td>
<td>No</td>
<td>Poor payback</td>
</tr>
<tr>
<td>E8</td>
<td>Improved Windows</td>
<td>IECC 2012 Code minimum vs. triple glaze, Low E Argon Glass</td>
<td>$362.00</td>
<td>$10,823.00</td>
<td>30</td>
<td>Yes</td>
<td>Longer Payback, but helps meet comfort of occupants</td>
</tr>
<tr>
<td>E11</td>
<td>Improved Skylights</td>
<td>IECC 2012 baseline vs. High Performance U=0.16, SHG - 0.06</td>
<td>$475.00</td>
<td>$11,896.00</td>
<td>25</td>
<td>Yes</td>
<td>Fair Payback</td>
</tr>
<tr>
<td>L1</td>
<td>Evaluate standard efficiency Lighting (LED) and controls</td>
<td>IECC 2012 minimum vs. 0.6w/sf overall goal</td>
<td>$9,681.00</td>
<td>$53,466.00</td>
<td>6</td>
<td>Yes</td>
<td>Excellent payback</td>
</tr>
<tr>
<td>C1</td>
<td>Provide High Efficiency Lighting (LED) and controls</td>
<td>IECC 2012 minimum vs. 0.6w/sf overall goal</td>
<td>$1,353.00</td>
<td>$100,000.00</td>
<td>74</td>
<td>No</td>
<td>Poor Payback</td>
</tr>
<tr>
<td><strong>VAE System EEM Analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM1</td>
<td>Utilize High Efficiency DX AHU</td>
<td>Versus Chilled Water AHU</td>
<td>$681.00</td>
<td>$-</td>
<td>-</td>
<td>Yes</td>
<td>Instant Payback</td>
</tr>
<tr>
<td>VM2</td>
<td>Provide High Efficiency Chiller (if VAV)</td>
<td>Provide High Efficiency chiller vs. code minimum</td>
<td>$1,726.00</td>
<td>$54,000.00</td>
<td>31</td>
<td>No</td>
<td>Poor payback</td>
</tr>
<tr>
<td>VM3</td>
<td>Provide High Efficiency Boiler (if VAV)</td>
<td>Use Condensing boiler vs. code minimum boiler</td>
<td>$6,888.00</td>
<td>$114,408.00</td>
<td>17</td>
<td>Yes</td>
<td>Fair Payback, Helps meet 27% efficiency Goal</td>
</tr>
<tr>
<td>VM4</td>
<td>Provide Energy Recovery on AHU's</td>
<td>Provide heat wheel energy recovery between relief and fresh air</td>
<td>$3,155.00</td>
<td>$88,500.00</td>
<td>28</td>
<td>No</td>
<td>Will consume significant floor space in addition to moderate payback</td>
</tr>
<tr>
<td>S1</td>
<td>Provide Transpired Solar Collector</td>
<td>Minimum outside air through &quot;solar wall&quot; type transpired solar collector</td>
<td>$243.00</td>
<td>$10,200.00</td>
<td>42</td>
<td>No</td>
<td>Poor payback</td>
</tr>
<tr>
<td>VM5</td>
<td>Provide Pool HVAC Dehumidification Unit with heat recovery for pool heating</td>
<td>Use heat recovery on the Pool Dehumidification unit for pool heating. Cost includes HVAC unit upgrade and necessary piping and valves to pipe pool water to the heat recovery HX</td>
<td>$5,838.00</td>
<td>$10,000.00</td>
<td>2</td>
<td>Yes</td>
<td>Excellent payback</td>
</tr>
<tr>
<td>P1</td>
<td>Use High Efficiency Condensing Boiler for pool heating</td>
<td>Provide condensing boiler vs. 80% boiler for pool heating</td>
<td>$759.00</td>
<td>$16,310.00</td>
<td>21</td>
<td>Yes</td>
<td>Fair Payback, Helps meet 24% efficiency Goal</td>
</tr>
<tr>
<td>P2</td>
<td>Use Geothermal HP for pool heating vs. standard 80% boiler</td>
<td>Use geothermally driven pool heating system</td>
<td>$328.00</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
<td>No payback</td>
</tr>
<tr>
<td>P3</td>
<td>Utilize an Electric Pool cover</td>
<td>Use electrically operated pool cover (Pool Consultant)</td>
<td>$886.00</td>
<td>$24,270.00</td>
<td>27</td>
<td>Yes</td>
<td>Fair Payback, will also reduce dehumidification load</td>
</tr>
</tbody>
</table>
Energy Generation:
- Solar Photovoltaic Panels – Option 1 and 2
- Wind Power – Not considered due to recent system failures and significant maintenance issues
### CO2 Equivalents for EEM Energy Savings Including PV Panels

<table>
<thead>
<tr>
<th>268.3</th>
<th>Metric Tons of CO2 equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>56.9</td>
<td>Passenger vehicles drive for 1 year</td>
</tr>
<tr>
<td>655,546</td>
<td>Miles Driven by an Average Passenger Vehicle</td>
</tr>
<tr>
<td>30,170</td>
<td>Gallons of Gasoline Consumed</td>
</tr>
<tr>
<td>293,114</td>
<td>Pounds of Coal burned</td>
</tr>
<tr>
<td>621</td>
<td>Barrels of oil consumed</td>
</tr>
</tbody>
</table>

Overall installing the accepted envelope, lighting, PV and VAV HVAC measures would result in energy savings of about $31,561.00 per Year.
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Current Status of Construction

EEM items
- All are on site except swimming pool covers (on order)
- Windows and skylights are completed
- Project Commissioning Process is started and ongoing
- All other EEM installed at this time but not all are currently connected to control systems
- Building systems are being placed on line daily
- Test and Balance scheduled to begin 11/08/2021
- Generator start up/test scheduled for 11/11/2021
- COVID 19 pre-cautions are being followed

- Construction Photos
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QUESTIONS & ANSWERS

Assiniboine & Sioux Tribes of the Fort Peck Indian Reservation