Fort Peck Wellness Center
Assiniboine & Sioux Tribes of the Fort Peck Indian Reservation

Office of Indian Energy Annual Program Review 2020 Meeting

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

- NE Montana
- 2.1 Million Acres
- Checkerboard Land Pattern

- Assiniboine & Sioux
- 11,000 members
- 6,700 live on Reservation

Fort Peck Wellness Center

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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? 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>
</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>
</tr>
<tr>
<td>E4</td>
<td>Improved Roof R Value</td>
<td>IECC 2012 Code minimum vs. architectural roof of R-41.3</td>
<td>$592.00</td>
<td>$89,970.00</td>
<td>152</td>
<td>No</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>
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<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>
</tr>
<tr>
<td>L1</td>
<td>Provide High Efficiency Lighting 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>
</tr>
<tr>
<td>C1</td>
<td>Evaluate standard efficiency Geothermal Heat Pump vs standard VAV</td>
<td>Use standard efficiency comparison</td>
<td>$1,353.00</td>
<td>$100,000.00</td>
<td>74</td>
<td>No</td>
</tr>
<tr>
<td><strong>VAV System EEM Analysis</strong></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>
</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>
</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>
</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>
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<tr>
<td>S1</td>
<td>Provide Transpired Solar Collector</td>
<td>Minimum outside air through “solar wall” type transpired solar collector</td>
<td>$243.00</td>
<td>$10,200.00</td>
<td>42</td>
<td>No</td>
</tr>
<tr>
<td><strong>Pool Systems EEM Analysis</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<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>
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<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>
</tr>
<tr>
<td>P2</td>
<td>Use Geothermal HP for pool heating vs. standard 80% boiler</td>
<td></td>
<td>$328.00</td>
<td>N/A</td>
<td>N/A</td>
<td>No</td>
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<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>
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</tbody>
</table>
Energy Generation:
- Solar Photovoltaic Panels – Option 1 and 2
- Wind Power – Not considered due to recent system failures and significant maintenance issues
<table>
<thead>
<tr>
<th>CO2 Equivalents for EEM Energy Savings Including PV Panels</th>
</tr>
</thead>
<tbody>
<tr>
<td>268.3 Metric Tons of CO2 equivalent</td>
</tr>
<tr>
<td>56.9 Passenger vehicles drive for 1 year</td>
</tr>
<tr>
<td>655,546 Miles Driven by an Average Passenger Vehicle</td>
</tr>
<tr>
<td>30,170 Gallons of Gasoline Consumed</td>
</tr>
<tr>
<td>293,114 Pounds of Coal burned</td>
</tr>
<tr>
<td>621 Barrels of oil consumed</td>
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</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
- Shop Drawing review
- Equipment ordered
- Material ordered

- No EEM installed at this time
- Envelope framing under construction
- COVID 19 precautions are being followed

- Construction Photos
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