Port Graham Woody Biomass Community Waste Heat Project

Charlie Sink, Chugachmiut
For
Port Graham Tribal Council
U.S. of Energy Tribal Energy Program
Annual Tribal Energy Conference 2012
November 13-16, 2012
Port Graham, Alaska

- Approximately 134 people
- Annual fuel consumption 53,100 gallons diesel fuel for heat
- Annual electrical usage 1,340,000 kWh/yr
Funding Agencies

US Department of Energy Tribal Energy Program (DOE/TEP)
http://apps1.eere.energy.gov/tribalenergy/

Alaska Energy Authority (AEA)
http://www.akenergyauthority.org/
4-Steps to Project Development

- Step 1 — Developing an Energy Strategy
- Step 2 — Developing a Feasibility Study
- Step 3 — Planning, Designing, Permitting, Purchase Agreements
- Step 4 — Shovel Ready Development and Testing
Strategic Plans

- Integrated Resource Management Plans
- Phase I November 2006
- Phase II October 2009
- Port Graham Corporation Forest Stewardship Plan
Why

Heating cost is approximately $6.00 gallon for fuel oil.
Where

Possible Heating Pipe Line for Port Graham Garn boiler phase 1

Pipe Line
- Main
- Possible Customer
- Spur
What
When
Feasibility Studies

- DoE Tribal Energy Program Port Graham Woody Biomass Feasibility Study July 2007
- Internal CHP Feasibility Study 2009
- Internal GARN Boiler Feasibility Study 2010
## Wood Combustion Scenarios

<table>
<thead>
<tr>
<th>A. Wood Furnaces/Boilers</th>
<th>Feedstock: Logs, wood chips, or pellets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Indoor Wood Boilers</td>
<td>Individual homes' and village buildings' heat</td>
</tr>
<tr>
<td>2. Small Outdoor Wood Furnaces</td>
<td>Individual homes' and village buildings' heat</td>
</tr>
<tr>
<td>3. Moderate Outdoor Wood Furnaces</td>
<td>Multiple (3–4) homes' and village buildings' heat</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Automated Combustion System</th>
<th>Feedstock: Wood chips</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Moderate Combustion System</td>
<td>Village buildings' heat and cannery steam</td>
</tr>
<tr>
<td>2. Large-Scale Combustion System</td>
<td>Entire village, i.e., homes and village buildings' heat and cannery steam</td>
</tr>
</tbody>
</table>
# Feedstock Costs

<table>
<thead>
<tr>
<th>Feedstock</th>
<th>Heating Value</th>
<th>Price/Cost</th>
<th>Per MMBtu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>130,000 Btu/gal</td>
<td>$6.00/gal</td>
<td>$46.00</td>
</tr>
<tr>
<td>Wood, dry</td>
<td>8100 Btu/lb</td>
<td>$60/ton</td>
<td>$4.20</td>
</tr>
<tr>
<td>Logs, 12% moisture</td>
<td>7100 Btu/lb</td>
<td>$97/ton</td>
<td>$6.80</td>
</tr>
<tr>
<td>Chips, 12% moisture</td>
<td>7100 Btu/lb</td>
<td>$240/ton</td>
<td>$15.00</td>
</tr>
<tr>
<td>Pellets, 5% moisture</td>
<td>7700 Btu/lb</td>
<td>$240/ton</td>
<td>$15.00</td>
</tr>
<tr>
<td>Fish Oil</td>
<td>120,000 Btu/gal</td>
<td>$1.00/gal</td>
<td>$8.50</td>
</tr>
</tbody>
</table>

EERC Table 3. Feedstock Costs
Politics

- Public opinion—local kind
- Local and private utility
- Public Utility Cooperatives
- State Regulatory Commission
- Federal Tax Credits and other support
- Carbon Credits
- Consultants and consulting firms and “other” experts
Step 3—Planning, Designing, Permitting, and Purchase Agreements

- Planning—an endless exercise
- Design—engineering design for technology and site design and fitting/retro-fitting
- Permitting—meeting regulatory requirements and land-use agreements
- Purchase Agreements—who will buy your product and what formal agreements are needed to obtain your fuel source
- Funding your project, matching and down payments, and what is the Pay Back Period*

*Pay Back Period is the time it takes to recoup the initial investment in a project.
Step 3—Planning, Designing, Permitting, and Purchase Agreements

- Alaska Department of Environmental Conservation
- Alaska Department of Fish and Game
- Alaska Department of Natural Resources
- Regulatory Commission of Alaska
- US Army Corp of Engineers
- US Bureau of Land Management
- US Coast Guard
- US Environmental Protection Agency
- Federal Aviation Administration
- Federal Energy Regulatory Commission
- US Forest Service
- US Fish and Wildlife Service
- And Others
Step 3—Planning, Designing, Permitting, and Purchase Agreements

- Long-term agreements
- Everybody wants to make money
- Everybody wants free energy
- Cost and collection
- What does the forest look like?
Step 4—Next Steps
Shovel Ready Project and Testing

Now you can build

Who manages the project?

Who does the construction?

Who does the testing?

Who operates and sustains the project?

Who collects the fees, operates, and manages the technology?
Questions