Fort Yukon
Wood Energy Program:
Wood Boiler Deployment

Prepared By:
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and
Bill Wall
Organizational Overview:

- Council of Athabascan Tribal Governments (CATG)
  - Consortia of 10 Tribal Governments of Interior Alaska
- Gwitchyaa Zhee Corporation (GZ Corp)
  - Alaska Native Claims Settlement Act Village Corporation
- Alaska Village Initiatives (AVI)
  - Rural Alaska economic development organization
Overview of Project:

- First off grid, off road system biomass CHP in the world
  - 8 miles north of the Arctic Circle
- New Power House
- Wood Chip Boiler
- District Heating loop providing heat to commercial buildings
  - Ie. School, AC, Radio Station, Water Plant, Clinic, etc.
Integrated Biomass Program

- Rural Economic Development
- Energy Cost Reduction
- Environmental Improvement
- Habitat Enhancement
- Wildfire Mitigation
- Community Biomass Utilization Program
## How much money will be spent?

<table>
<thead>
<tr>
<th>Funder/Grantee</th>
<th>Amount</th>
<th>Source</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denali Commission (DC)/Alaska Energy Authority (AEA)</td>
<td>$808,805</td>
<td>Round “zero” Renewable Energy Fund</td>
<td>Grant Secured - Match in place - Harvest Equipment</td>
</tr>
<tr>
<td>DC/Alaska Village Initiatives (AVI)</td>
<td>$258,300</td>
<td>Economic Development Program</td>
<td>Training and Tech Support and Harvest Plan</td>
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<tr>
<td>DC/AEA</td>
<td>$60,000</td>
<td>Energy Program Planning/Design</td>
<td>Comprehensive Energy Business Plan including Rural Power System Upgrade (RPSU), heat utility/wood harvest, biomass diesel hybrid power and integrated district heat system. 1st draft completed</td>
</tr>
<tr>
<td>AEA</td>
<td>$210,000</td>
<td>Final Design Funds AEA</td>
<td>In conjunction with DOE and is match</td>
</tr>
<tr>
<td>DOE</td>
<td>$210,000</td>
<td>Phase 1 80% design DOE</td>
<td>In conjunction with AEA and is match</td>
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<tr>
<td>DOE/CATG</td>
<td>$990,000</td>
<td>Renewable Energy DOE</td>
<td>Construction or other support functions needs 1:1 Match</td>
</tr>
<tr>
<td>AEA/GZ</td>
<td>$2,300,000</td>
<td>REF Round (3) AEA</td>
<td>Construction Funds</td>
</tr>
<tr>
<td>GZ Cash</td>
<td>$300,000</td>
<td>Cash GZ</td>
<td>Company start up fundfs</td>
</tr>
<tr>
<td>DC/AEA</td>
<td>$280,000</td>
<td>RPSU Program</td>
<td>Diesel powerhouse design &amp; CHP BOP</td>
</tr>
<tr>
<td>AEA/Power House funding</td>
<td>$3,500,000</td>
<td>Awarded from USDA - NEPA needs to be done</td>
<td>Diesel powerhouse construction</td>
</tr>
<tr>
<td>GZ Match Land and Building</td>
<td>$400,000</td>
<td>GZ Corp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$9,317,105</td>
<td>Total Funding Secured</td>
<td></td>
</tr>
</tbody>
</table>
Products thus far:

- Conceptual Design
- Financial Analysis –
  - @ 4.10 a gallon & $250 a ton with 70% displacement a $80K boiler pays back in 3 years.
- Boiler Business Plan
- Powerhouse business Plan
- Combined business plan
- Harvest Plan
- Operations Plan
- Environmental Assessment
- Harvest Equipment
Power Costs: among highest in nation

- Gasoline = $8.50 per gallon
- No 1 Diesel = $7.00 per gallon
  - Average house hold cost for oil = $3,500 per year
  - Oil cost per year for school = $210,000
  - Fuel cost for electrical generation = $1.4 M
- Cord Wood = $275 - $300 per cord
- Kwh = $0.51 (rate increase coming)
- Propane = $193 per 100 lbs tank
Years achievements:

- Funder reassurance
- Consultant accountability
- Harvest Equipment Grant
- Harvest site selection
- Power house funding
- Two pieces of Equipment
- Integrated business plan
Implementation Plan

- CHP (Power house) Facility construction
  - Who is responsible
  - Objectives List
  - Timeline for completion
- Biomass Harvest
  - Timeline
  - Operations
Implementation Plan

- CHP Facility construction – Power house
  - Who is responsible:
    - AEA will manage the construction
    - Steve Stassel will preform engineering over site
    - Construction contract will go through standard AEA biding process.
  - Objectives List
  - Timeline for completion
Implementation Plan

- CHP Facility construction – Power house
  - Who is responsible
  - Objectives List:
    - Finalize legal paperwork for site control
    - Survey plot, including topographic (completed)
    - Design Facility layout
    - AEA put construction contract out to bid
    - Begin construction – Spring 2012
    - Finish construction – Fall 2012
  - Timeline for completion
Implementation Plan

- CHP Facility construction – Power house
  - Who is responsible
  - Objectives List:
  - Timeline for completion
    - Finalize legal paperwork for site control – DEC 2011
    - Survey plot, including topographic - completed SEPT 2011
    - Design Facility layout – Late Winter 2012
    - AEA put construction contract out to bid – Late winter
    - Begin construction – Spring 2012
    - Finish construction – Fall 2012
The loop:
Implementation Plan

- **Biomass Harvest**
  - **Timeline:**
    - Environmental Analysis
    - Equipment arrival
    - Clear Storage site
    - Permitting for Landing Site
    - Develop landing to harvest site
    - Harvest Fiber
      - December-April 2012
  - **Operations**
Implementation Plan

- Biomass Harvest
  - Timeline
  - Operations: Four primary components
    - Trail Development to Ulota island
    - Felling Fiber
    - Transport
Year 1 Harvest Area: Slough Crossing
Implementation Plan

- Biomass Harvest: Operation Detail - Year 1
  - Cutting
    - Kubota 080 & New Holland TV 6070
  - Transport
    - Sled to staging area
  - Stack for drying
    - Separate by relative species
Implementation Plan: Next 3 months

- Final Environmental Analysis
- Alaska Forest Practices Act notification
- Legal site control for facility
- Final Design
- Harvest Contract