Togiak Heat Recovery

Dan Smith, Project Manager

ANTHC Rural Energy
Togiak Natives Limited

- Founded in 1973, Togiak Natives Limited is a village corporation formed under the Alaska Natives Claims Settlement Act.
- Serves approximately 959 shareholders.
  - Roughly 692 live in Togiak
  - Total Population is about 800
Alaska Native Tribal Health Consortium

Vision:
Alaska Natives are the Healthiest People in the world

Formed in 1998
Consortium of the Alaska Tribal Health System (ATHS)

We believe basic sanitation should be efficient, sustainable and affordable
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ANTHC Rural Energy

Our Purpose

The Alaska Native Tribal Health Consortium’s (ANTHC) Rural Energy Initiative works with communities to implement innovative energy efficiency and renewable energy solutions to make public sanitation affordable and resilient for the people we serve across Alaska.

We believe basic sanitation should be efficient, sustainable and affordable.
How We Can Decrease Cost and Generate Sustainability

Breakdown of average operating costs for a water/sewer system in rural Alaska

Energy, 39%
Labor, 44%
Parts, 13%
Regulatory, 4%

We believe basic sanitation should be efficient, sustainable and affordable
The 1st Step: Energy Efficiency

• Make our homes, workplaces and communities energy efficient
  – Appliances
  – Lighting & Insulation
  – Building envelope

• Energy Efficiency is far cheaper than renewable energy

• Once efficient, pursue renewable or more intensive energy sources/retrofits
Typical Heat Recovery in Rural Alaska

- Heat for occupied building space – see below
- Adding heat to water/sewer – next slide
- Over 75 heat recovery systems operating in Alaska
Adding heat to water/sewer
Project Partners

- Togiak Natives Limited (TNL)
- City of Togiak
- Alaska Village Electric Cooperative (AVEC)
- Alaska Native Tribal Health Consortium (ANTHC)
- US Department of Energy – Office of Indian Energy (DOE-OIE)
- Alaska Energy Authority (AEA)
- State of Alaska – Department of Environmental Control
Project History

- Originally explored Heat Recovery feasibility in 2010
- Applied to AEA Renewable Energy Fund (REF) in 2011
- REF grant awarded in 2012 ($443,030)
- Shifting priorities delayed the project
  - Cost estimate revealed to be much higher than feasibility calculations
- Design completed in March 2019
- Additional funding sources secured during fall 2019
  - State of Alaska revolving fund loan
  - DOE Tribal Energy Infrastructure Grant
Project History, Part 2

• Covid Pandemic cast uncertainty on project timeline
  • able to deploy with minimal delays
  • first on site September 8th, 2020
• Majority of work is completed
  • Last minute change order to adhere to heat supplier (AVEC) requirements
  • Final Training slated for early 2021
• Community has already begun exploring the possibility of expanding the heating district to the nearby VPSO and Clinic buildings
Project Summary

- **End Users:**
  - Water Treatment Plant
  - City Office
  - Library
  - City Shop
    - Search & Rescue Garage
- **Future Expansion**
  - Clinic
  - VPSO
Project Numbers – The Cost

- Original Cost $1,276,106
  - DOE $638,053
  - Cost Share $638,053
    - Alaska Energy Authority
- With change orders due to Covid+AVEC changes
  - Estimated $1,426,000
- Heating Fuel Cost in Togiak
  - $5.63 per gallon
Project Numbers – The Benefits

- Water rate stabilization
  - 2006 - $100
  - 2019 - $120
  - State Best Practices scores

- Offsets carbon emissions
  - Offset 13,691 gallons annually
  - Over 410,000 gallons over project life
  - 306,404.58 lbs. of carbon dioxide annually
Project Numbers – The Benefits

- Water rate stabilization
  - 2006
    - Water & Sewer - $100
    - Emergency - $45
  - 2019
    - Water & Sewer - $120
    - Emergency - $60
  - State Best Practices scores
- Annual Offset
  - $77,080 offset heating oil
  - $2.3 Million over Project Life
- Heat Sales Agreement
  - $53,956 after heat sales agreement
  - $1.6 Million Project Life Savings
- Offsets carbon emissions
  - Offset 13,691 gallons annually
  - Over 410,000 gallons over project life
  - 306,404.58 lbs. of carbon dioxide annually
### Project Numbers – The Benefits

**Fuel Offsets**

<table>
<thead>
<tr>
<th>Facility</th>
<th>Estimated Annual Fuel Usage (Gallons)</th>
<th>Estimated Heat Delivered (Equivalent Gallons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Treatment Plant</td>
<td>7,795</td>
<td>7,795</td>
</tr>
<tr>
<td>City Office</td>
<td>2,710</td>
<td>2,710</td>
</tr>
<tr>
<td>&quot;Old School&quot; (Library/Garage)</td>
<td>3,186</td>
<td>3,186</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13,691</strong></td>
<td><strong>13,691</strong></td>
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- Additional Heat available for future expansion
  - Equivalent to 16,700 gallons or more
  - Equivalent to approx. 2,200 MMBTU
We’re always looking to identify ways to increase the affordability and efficiency of Public Health Infrastructure in Rural Alaska.

...Questions?