COMMUNITY HEATING WITH LOCAL WOOD
HAINES BIOMASS DISTRICT ENERGY

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Southeast Conference
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PROJECT BACKGROUND

• **20XX Borough secures project funding:** construction through AEA and design through US Forest Service

• **2015 the Borough came into possession of ACT boiler equipment:** three boilers, two pellet silos and augers, and two thermal storage buffer tanks

• **2017 Borough retains Wisewood Energy to develop construction documentation** for a biomass boiler to serve the School, Pool, and future greenhouse

• **Borough objectives:**
  - Utilize existing ACT boiler equipment if possible
  - Enable use of pellets in the short-term, and locally-produced wood chips in the long-term
  - Consider inclusion of Library and Admin buildings for expanded district heating
## COMPARISON OF BIOMASS BOILER TECH

<table>
<thead>
<tr>
<th>BOILER TYPE</th>
<th>ACT CP 1350 and CP 1700</th>
<th>VIESSMANN PYROT 400</th>
<th>VIESSMANN PYROTEC 720</th>
<th>FRÖLING TM400</th>
<th>KOHLBACH K8 800</th>
</tr>
</thead>
</table>
| **OUTPUT CAPACITY** | 1.36 MMBtu/hr (400kW)  
1.7 MMBtu/hr (500kW) | 1.36 MMBtu/hr (400kW) | 2.46 MMBtu/hr (720kW) | 1.36 MMBtu/hr (400kW) | 2.73 MMBtu/hr (800kW) |
| **NUMBER OF BOILERS NEEDED** | 2 | 2 | 1 | 2 | 1 |
| **FUEL SPEC** | Wood pellets  
Wood chips: <30% mc, <1.25” | Wood pellets  
Wood chips: <35% mc, <2” | Wood pellets  
Wood chips: <50% mc, <2” | Wood pellets  
Wood chips: <45% mc, <2-4” | Wood chips: <55% mc, <6” |
| **BOILER COST ESTIMATE** | $30-60,000 for refurbish | 2 x $250,000 = $500,000 | $350,000 | 2 x $150,000 = $300,000 | $500,000 |
| **RECOMMENDED** | No | No | No | Yes | No |

*The Fröling TM400 can accept wood chips up to <4” with a hydraulic ram in-feed system.*

**Cost estimates are for boiler unit only, and do not include fuel storage feeding equipment.**

Note: Boilers are rank ordered by fuel quality, from most refined fuel specification to most coarse.
ENERGY ANALYSIS

Estimated Heat Load Coverage by New Wood-Fired Boiler

- K-12 School and Pool
- Admin Building
- Library
- Voc-Ed
- Garage
- 60' x 40' Greenhouse
- Wood Boiler Load Coverage
## PRELIMINARY OPERATING COSTS

<table>
<thead>
<tr>
<th>FACILITIES</th>
<th>AVE. ANNUAL OIL USE (GAL)</th>
<th>AVE ANNUAL COST ($)</th>
<th>AVE ANNUAL HEAT DEMAND (MMBTU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUEL OIL</td>
<td>$140,300</td>
<td></td>
<td>WOOD FUEL</td>
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<tr>
<td>ELECTRICITY</td>
<td>$23,600</td>
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<td>ELECTRICITY</td>
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<td>OPERATIONS</td>
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<tr>
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<td>TRIM FUEL (PROPANE)</td>
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<td>TOTAL</td>
<td>$171,900</td>
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<tr>
<th>ASSUMPTIONS</th>
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<tbody>
<tr>
<td>OIL</td>
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<tr>
<td>$3.17/GAL</td>
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<tr>
<td>PROPANE</td>
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<td>$0.21/KWH</td>
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<tr>
<td>WOOD FUEL</td>
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<tr>
<td>$130/GT</td>
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</tbody>
</table>

Approx. $74,000 in savings estimated for year one
NEXT STEPS

• Evaluate impact of dropping buildings
• Execute contract for next scope of work
• Initiate detailed mechanical design
THANK YOU!

Technology in Service of Community and Environment

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