Sustainable Forest Management

Wood to Energy in the West

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USFS
Imagine an Invention

- Solar Collector
- Organic Battery
- Collectors provide complex habitat
- Structures for human habitat
- Carbon filtration from atmosphere
- Water storage and filtration system
- Produces the oxygen we breathe
Sustainable Forest Management

- For what and for whom?
- Landowner objectives
  - Aesthetics - recreation?
  - Wildlife Habitat?
  - Wildfire risk management?
  - Insects and Disease?
  - Climate Change mitigation? Adaptation? Resilience?
  - Wood production?
This

Or

This

Planned fire

Wildfire
No Treatment – Crown Fire

Treatment Zone

40 Homes in this Zone

Direction of Fire
Biomass Rides Coattails

- Higher values - Integrated Industry;
  - Flooring, windows, boards, posts & poles, shavings, pulp, energy - pellets, chips
  - Energy is lowest value residuals

OR

- Other objectives pay for treatment
  - Fire thinning
  - Wildlife Habitat
  - Watershed protection
Forest Health

Spruce Budworm

Mountain Pine Beetle
Fire Hazard & Bark Beetle Hazard Thinning Project

Slash, Pile and Burn or Pay to Thin Remove and Utilize
Existing Systems

Chadron State College – 17 yr
University of Idaho -24+ yr

Industry – Wood Products
Food – Potatoes, Beer

Pulp Mill -CHP
Darby, MT – 8+ yr
Darby, MT K-12 Schools

• Replaced Fuel Oil w/ Wood Chips
• Operational in 2003 = 8 yr
• Saved $30,000 yr 1 @ $1.00/ gal
• Saved $140,000 yr 5 @ $3.50/ gal
• Total Saved $800,000+
• Cost: $850,000
• Useful life 30+ yr
• Teacher salary~ $30,000/ yr
Darby, MT

High Tech Control Systems
New Construction
Glacier High School

A. Integrated wood heat during schematic design.
B. Wood heating system cost ~½ conversion.
C. Wood system meets 95% annual load.
Production & Transportation

Local Jobs

Pellet Manufacturing Plant
Fuel Cost Comparison

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Cost Per Thousand MJ's</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Oil</td>
<td>$3.25/gallon</td>
</tr>
<tr>
<td>Propane</td>
<td>$2.00/gallon</td>
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<tr>
<td>Natural Gas</td>
<td>$7.50/decatherm</td>
</tr>
<tr>
<td>Pellets</td>
<td>$150.00/ton</td>
</tr>
<tr>
<td>Wood Chips</td>
<td>$40.00/ton</td>
</tr>
</tbody>
</table>
Take Home on Wood

• Renewable, Domestic Energy
• Co-Benefits!
  – Wildfire mitigation
  – Watershed protection
  – Air emissions
• Save Money & Create Jobs!
• Reduced foreign oil dependence
• If you don’t grow it, you mine it!
• Forests are green!