SUCCEEDING WITH FOREST MANAGEMENT & DOMESTIC ENERGY PRODUCTION

ROB DAVIS

Woody BUG

June 9, 2009
It is working!!

- Negative Operating Conditions
  - Lowest lumber & wood products prices in over 35 years
  - Highest fuel prices ever
  - Worst International Economy

- But it is working
  - Restoration of thousands of acres annually with very large small diameter component
  - Net cost decrease with no fuel or labor price escalation
Results

- New sawmills
- New biomass power plant
- New wood treatment facility

Current situation

- The sawmills are shut down
- The treatment facility is operating at a minimum
- The power plant with subsidies through the federal PTC and other tax benefits and State REC can not pay the cost of restoration
- How can the contract continue to function???
Thermal Energy

- Thermal energy is economical
- Biomass thermal fuels are virtually the only market that continues and can support the cost of the contract
- Even more biomass fuels could be produced if there were more encouragement of the markets
THERMAL ENERGY

1/3 of the US energy consumption

The only non-subsidized renewable energy

Is carrying the success of the largest stewardship contract in the US.

It is the most efficient and economical solution for our forests, our energy demands and our Global warming challenges.
Highest and Best Use

- Products
- Energy
Energy Highest and Best Use

- What are the “optimum” utilization paths for biomass?

- How do we achieve the most benefit per ton = $ payment per ton
  - Useable Energy generated
  - Fossil Fuel displaced
  - GHG reduction
  - Jobs
  - $ remaining in Community
  - Biomass resource management improvement
Biomass Energy Efficiency

• Thermal Energy: up to 90%

• Electricity (stand alone): 15%- 39%

• CHP: 20% - 80%

• Fuels (BtL, Ethanol, SNG): 35% - (> ) 60% (maybe in future higher, especially for SNG)

• (Energy Economics Group Vienna University of Technology)
One ton of dry wood contains 5.0 MWhr of energy

- **Electrical Generation**
  - Produces 1.25 MWhr
  - Displaces 63 therms of Natural Gas

- **Thermal Energy**
  - Produces 4.50 MWhr of usable energy
  - Displaces 157 therms of Natural Gas
Biomass to produce 100 MWhr

- Stand Alone Electrical: 80 tons
- Transportation Fuels: 50 tons
- Thermal: 25 tons

Which is the Highest and Best Use?

Which can pay more for the resource?
<table>
<thead>
<tr>
<th>Heat</th>
<th>Electricity and Heat</th>
<th>Transport fuels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood log boiler</td>
<td>Pellet boiler</td>
<td>Wood chip boiler</td>
</tr>
<tr>
<td>Wood chip</td>
<td>District heating</td>
<td>CHP steam turbine</td>
</tr>
<tr>
<td>Heating boiler</td>
<td>Stirling engine</td>
<td>ORC</td>
</tr>
<tr>
<td>BtL</td>
<td>Lignocellulose</td>
<td>Ethanol</td>
</tr>
<tr>
<td>SNG</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Forest Biomass to Energy

- Highest and Best Use
- Local Use
- Thermal energy
- Thermal Based CHP
Advocating the best solutions for Biomass

1211 Connecticut Ave NW, Suite 600
Washington, DC 20036-2701
202-596-3974 tel    202-223-5537 fax
www.biomassthermal.org

Rob Davis
rdavis@forestenergy.com