Biomass Markets and Sales

Mimi Barzen, MN DNR

Fueling the Future:
The Role of Woody Biomass for Energy Workshop

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Brainerd

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Biomass Markets and Sales
“The United States has 5 percent of the world’s population but uses 25 percent of the world’s energy.”
Donald Klass
Biomass interest

- Increasing energy prices
- Climate change concerns
- Governor Pawlenty’s 25 in 2025
Woody biomass sources

**Logging Residue** *Largest potential source*
3.6 million cords harvested annually

Other Sources of Woody Biomass:
- Primary Mill Residue
- Secondary Mill Residue
- Dedicated energy crops
- Land clearing projects and urban waste
- Brushlands
- Precommercial thinning, TSI
## Biomass volume

<table>
<thead>
<tr>
<th></th>
<th>Available</th>
<th>Utilized</th>
<th>Net Available</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forest total</strong></td>
<td>2,924,500</td>
<td>748,900</td>
<td>2,175,600</td>
</tr>
<tr>
<td><strong>Primary Industry</strong></td>
<td>1,840,800</td>
<td>1,730,000</td>
<td>110,800</td>
</tr>
<tr>
<td><strong>Secondary Industry</strong></td>
<td>466,870</td>
<td>380,910</td>
<td>85,960</td>
</tr>
<tr>
<td><strong>Urban</strong></td>
<td>925,000</td>
<td>225,900</td>
<td>699,100</td>
</tr>
<tr>
<td><strong>Total all sources</strong></td>
<td>6,157,170</td>
<td>3,085,710</td>
<td>3,071,460</td>
</tr>
</tbody>
</table>
Marketing biomass

Limiting factors:

► Chip size
► Chip quality
► Percent bark
► Amount of dirt
► Processing efficiency
► End product
Marketing biomass

End Products:

**Engineered wood:** Georgia Pacific-Duluth International Bildrite in International Falls

**Landscape Mulch:** Markets vary by region – mostly urban tree trimming, land clearing, and sawmill bark residue.

**Animal Bedding:** Dairy and poultry industry utilize sawdust and shavings, processed from mill residue and usually not roundwood

**Energy:** Mills and processors have used residue for heat, steam, and electricity for decades

**Special Forest Products:** Small, but growing market
Marketing biomass

**Limiting factors:**
- Collection of logging residue as a product for sale
- Transportation costs are causing a limited procurement range
- Prices paid are a concern for the supplier

Pellet manufacturers face many of the same challenges

Biomass still upcoming commodity
Biomass limiting factors - loggers

- Lack of consistent market for biomass
- Low price paid for biomass
- Long haul distance to deliver biomass
- Lack of efficiency in harvesting biomass – individual and multiple sites
Biomass harvest
Biomass harvest
Biomass harvest
Biomass harvest
Biomass harvest
Biomass harvest

Residue remaining meets or exceeds biomass harvest guidelines.
Biomass harvest

Post-harvest residue
Biomass markets

**State prices**

- Auction price – standing green, slash, down and dead $0.38 per 1000 lb units.
- Informal sale – standing green, slash, down and dead $0.50 per 1000 lb units.
- Sales with biomass chipping is optional - sold as added timber
## Biomass Markets

### Large Woody Biomass Consumers in Minnesota

<table>
<thead>
<tr>
<th>Company</th>
<th>City</th>
<th>Fuel source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minnesota Power</td>
<td>Grand Rapids, Duluth</td>
<td>Mill and logging residue</td>
</tr>
<tr>
<td>Boise</td>
<td>International Falls</td>
<td>Mill and logging residue</td>
</tr>
<tr>
<td>Verso Paper</td>
<td>Sartell</td>
<td>Mill and logging residue</td>
</tr>
<tr>
<td>SAPPI</td>
<td>Cloquet</td>
<td>Mill and logging residue</td>
</tr>
<tr>
<td>Woodcraft Industries</td>
<td>Foreston</td>
<td>Mill residue</td>
</tr>
<tr>
<td>Valley Forest Wood Products</td>
<td>Marcell</td>
<td>Logging residue</td>
</tr>
<tr>
<td>St. Paul District Energy</td>
<td>St. Paul</td>
<td>Urban and logging residue</td>
</tr>
<tr>
<td>Laurentian Energy Authority</td>
<td>Virginia, Hibbing</td>
<td>Logging residue</td>
</tr>
<tr>
<td>Central Minnesota Ethanol</td>
<td>Little Falls</td>
<td>Mill and logging residue</td>
</tr>
<tr>
<td>Minntac Taconite Kiln</td>
<td>Mountain Iron</td>
<td>Mill residue</td>
</tr>
<tr>
<td>FibroMinn</td>
<td>Benson</td>
<td>Wood chips, turkey manure</td>
</tr>
<tr>
<td>Chippewa Valley Ethanol</td>
<td>Benson</td>
<td>Wood chips</td>
</tr>
</tbody>
</table>
Biomass markets

- St Paul District Energy and MN Power are the biggest consumers
- Biomass gasification testing at Grand Forks, including woody biomass.
- Laurentian Energy Authority, converted to woody biomass plants in Hibbing and Virginia.
- Interest building in making ethanol from woody biomass (potential for bio-refineries).
- Abitibi in Fort Francis last phase of test-firing biomass facility
## Woody Biomass Consumers

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
<th>Fuel Supply Radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hill Wood Products</td>
<td>Cook/Mt Iron</td>
<td>200 mi</td>
</tr>
<tr>
<td>Woodcraft Industries</td>
<td>St. Cloud</td>
<td>300 mi</td>
</tr>
<tr>
<td>Hedstrom Lumber</td>
<td>Grand Marais</td>
<td>150 mi</td>
</tr>
<tr>
<td>Bergen's Greenhouses</td>
<td>Detroit Lakes</td>
<td>200 mi</td>
</tr>
<tr>
<td>Creative Sawmilling &amp; Products LLC</td>
<td>Bovey</td>
<td>10 mi</td>
</tr>
<tr>
<td>Hulls Sawmill</td>
<td>Two Harbors</td>
<td>30 mi</td>
</tr>
<tr>
<td>Isabella Community Center</td>
<td>Isabella</td>
<td>20 mi</td>
</tr>
<tr>
<td>Jarden Home Brands</td>
<td>Cloquet</td>
<td>50 mi</td>
</tr>
</tbody>
</table>
Biomass facilities

- Besides these consumers there are more than 25 facilities reporting utilization of woody biomass for heat and power.

- Additional facilities are in the feasibility stage of development as well as others working on upgrades of the current operation.

- Changes are constant and some operations may start and stop operations periodically.
# Biomass - potential facilities

<table>
<thead>
<tr>
<th>Woody Biomass Consumers</th>
<th>Location</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Location</td>
<td>Status</td>
</tr>
<tr>
<td>Nett Lake Cellulosic</td>
<td>Boise Forte Indian Reservation</td>
<td>proposed</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Benson</td>
<td>active</td>
</tr>
<tr>
<td>Chippewa Valley</td>
<td>Benson</td>
<td>proposed</td>
</tr>
<tr>
<td>Ethanol Phase 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chippewa Valley</td>
<td>Benson</td>
<td>proposed</td>
</tr>
<tr>
<td>Ethanol Phase 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas Technology</td>
<td>Coleraine</td>
<td>proposed</td>
</tr>
<tr>
<td>Institution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fond du Lac Resource</td>
<td>Cloquet</td>
<td>test phase</td>
</tr>
<tr>
<td>Mgmt.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Itasca Power</td>
<td>Mt Iron and Remer</td>
<td>proposed</td>
</tr>
<tr>
<td>Northome Biomass Plant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain Timber</td>
<td>Mountain Iron</td>
<td>grant phase</td>
</tr>
<tr>
<td>Wilderness Wood</td>
<td>Orr</td>
<td>negotiations</td>
</tr>
<tr>
<td>Products</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Biomass markets

Market considerations

- Contracts and prices vary at each facility
- Long term supply contracts are in the best interest of both vendor and consumer
- New and expanded facilities are planned in the forested part of the state and in the Metro area
- Market opportunities for suppliers will expand over the next 3-5 years
Biomass markets - demand

- Most competitive in Metro area with expanding radius of supply
- SE MN – No major consumer – Some struggle to stay profitable
- Central and NE MN – Improving market with new consumers coming on line
- NW MN- New consumers developing or in feasibility stage
Biomass market issues

- Dependent on value and price consumers are able to pay versus alternate fuels.
- Distance to markets – critical
- Efficiency and ease of collection – differs throughout the state
- Procurement companies – contracted to supply feedstock to facility.
- Pollution concerns due to burning lacquers and glue
Biomass market commodity trading - advantages

- Could encourage the development of facilities
- Increase the value of woody and agricultural residues
- Stabilize the supply
- Standardize quality and physical characteristics
- Create innovations for collection
Biomass markets
commodity trading - disadvantages

- Low energy to density ratio
- No governing body to set and enforce standards
- Currently no central market mechanism for efficient contracting
- Uncertain volume and price structure
- Transportation issues
Biomass – on the horizon

- Invasive species could cause flood on market
- Competitiveness of pulp and paper and other wood industries will have an influence
- New products or manufacturing processes may play a key role
Biomass is piling up.