UNIVERSITY OF MINNESOTA
EXTENSION

Biomass Markets and Sales

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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

Biomass (green tons)			
	Available	Utilized	Net Available
Forest total	**2,924,500**	**748,900**	**2,175,600**
Primary Industry	1,840,800	1,730,000	110,800
Secondary Industry	466,870	380,910	85,960
Urban	925,000	225,900	699,100
Total all sources	**6,157,170**	**3,085,710**	**3,071,460**

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 chipper

Biomass harvest

Biomass harvest

Biomass harvest

Biomass harvest

Biomass harvest

Biomass harvest

Biomass harvest

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		
Company	**City**	**Fuel source**
Minnesota Power	Grand Rapids, Duluth	Mill and logging residue
Boise	International Falls	Mill and logging residue
Verso Paper	Sartell	Mill and logging residue
SAPPI	Cloquet	Mill and logging residue
Woodcraft Industries	Foreston	Mill residue
Valley Forest Wood Products	Marcell	Logging residue
St. Paul District Energy	St. Paul	Urban and logging residue
Laurentian Energy Authority	Virginia, Hibbing	Logging residue
Central Minnesota Ethanol	Little Falls	Mill and logging residue currently idle
Minntac Taconite Kiln	Mountain Iron	Mill residue
FibroMinn	Benson	Wood chips, turkey manure
Chippewa Valley Ethanol	Benson	Wood chips

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

Biomass - smaller markets

Woody Biomass Consumers		
Name	**Location**	**Fuel Supply Radius**
Hill Wood Products	Cook/Mt Iron	200 mi
Woodcraft Industries	St. Cloud	300 mi
Hedstrom Lumber	Grand Marais	150 mi
Bergen's Greenhouses	Detroit Lakes	200 mi
Creative Sawmilling & Products LLC	Bovey	10 mi
Hulls Sawmill	Two Harbors	30 mi
Isabella Community Center	Isabella	20 mi
Jarden Home Brands	Cloquet	50 mi

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

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

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.

Questions?

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