

UNIVERSITY OF MINNESOTA

EXTENSION

Marketing and Sales of Woody Biomass

Mohammed Iddrisu, Minnesota Department of Natural Resources

Fueling the Future:

The Role of Woody and Agriculture Biomass for Energy Workshop

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Some History

- 1970's energy crisis results in government subsidies and research
- 1978 Public Utilities Regulatory Policy Act (utilities must buy energy from other producers)
- During 1980's, 6,300 megawatts of new wood fired capacity added (from 200 megawatts in late 1970's)

And Then

- 15 plants in CA alone are bought out and closed by utilities (to reduce costs associated with buying their power; Bergman and Zerbe 2005)
- During the 1990's not many new plants were built
- It is believed that this is due to limited tax credits, increased conventional power capacity and overall low fuel costs

Now

- Resurge in interest in biomass
- Costs of energy is increasing
- At the same time forest fires are increasing and forest fuels reduction needs have reached epidemic levels in some parts of the country
- Great public interest in renewable energy
- Public concern about CO2 etc.
- Governor Pawlenty's 25 in 2025

Woody Biomass Sources

What are some sources of woody biomass, and how can markets be used to accomplish improved forest management and in some cases generate income?



1) Biomass From Logging Residue (tops and limbs)

Logging residue is by far the largest landowner-supplied biomass source (along with a bit of small diameter timber and low merchantability species) currently being used in biomass markets.

Much of the logging residue resource is currently untapped, unless one happens to be pretty close to a biomass market.



2) Forest Health Management and Invasive Species Control

- Small diameter pine thinnings and utilization of tops and limbs for bark beetle control
- Early spruce thinnings
- Tamarack salvage after larch beetle, white spruce and balsam fir salvage after spruce budworm, and localized outbreak salvage, especially for jack pine budworm and two-lined chestnut borer.
- If Emerald Ash Borer (EAB) should have an outbreak in Minnesota requiring sanitation of ash in an infection center, utilization of some the trees for biomass could be an important strategy for reducing cost & improving treatment effectiveness.

3) Brush From Brushlands

- There can be excellent wildlife habitat benefits from greater management of brushlands. Brushy areas are some times “sheared” with bulldozers to either set the vegetation back to an earlier age, or establish a more open, grassy condition. Costs of managing this resource may be reduced by sale of some harvested brush material for biomass markets.



4) “Precommercial Thinning” and Timber Stand Improvement (TSI)

- A resource of currently unmerchantable woody material is produced during forest management activities such as very early thinnings. If the economics can be made to work, and ecological concerns are addressed, the potential forest management benefits of being able to accomplish more of this work would be significant.

5) Dedicated Energy Crops

- Very small acreages of Short Rotation Woody Crops (SRWC) are currently being grown specifically for energy in Minnesota. Most SRWC in Minnesota is hybrid poplar, most of which will go to the highest value markets such as pulp & paper and OSB. Even if the main stems go to other markets however, the top and limb portion of the harvested trees could fit biomass energy markets nicely.

6) Land Clearing and Road Construction Projects

- Significant resource from powerline clearing and road projects. Past practice has been to dispose of this material on-site through open burning or sometimes chipping and spreading the material. Challenges to greater utilization include keeping dirt off of the material and changing contracting language and procedures.

7) Fire Hazard Fuel Reduction Activities

- Vegetation reduction around homes in the rural-urban interface can make a huge difference in home's wildfire defensibility. Use of biomass resulting from fuel reduction activities should reduce the cost of the work.

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

Woody Biomass Markets

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 Sales: Reality Check

- Logging Residue (and in some cases small diameter and low value species timber) are likely to be the only type of biomass a landowner can currently sell.
- Biomass sales can be an opportunity for some additional income, improved forest management in some cases and contributing to the local economy and renewable energy goals. All good things, but **it is unlikely that any landowner is going to get rich off of biomass sales any time soon.**
- There will almost certainly be greater opportunities for biomass sales in the future, as renewable energy markets develop further. This will take some time.

Biomass Sales

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 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	Big Fork and Remer	permit processing?
Mountain Timber Wilderness Wood Products	Mountain Iron	grant phase
	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?

Mohammed Iddrisu

mohammed.iddrisu@dnr.state.mn.us

(320) 679-4604