Producing Raw Material for the Biomass Energy Markets

Presented by

Jerry Morey
President
Bandit Industries, Inc.
Cumulative new NA wood biomass demand 2007-15

Source: RISI Wood Biomass Market Report
MARKETS:
Introduction to Current Bioenergy Markets

A) Direct-Fired Power Plants
B) Pellet Production
C) Ethanol Production
MARKETS:
Introduction to Current Bioenergy Markets

A) Direct-Fired Power Plants
- Heat, steam and co-generation of electricity.
- Economically competitive with traditional fossil fuels.
- Schools, municipalities installing wood-fired heating systems.
- USDA’s Biomass Crop Assistance Program offering dollar for dollar match, up to $45.00 per dry ton to eligible biomass producers.
MARKETS:
Introduction to Current Bioenergy Markets

B) Pellet Production
   – Economically viable?
   – Pellets for home heating
   – Europe imports over 1 million tons of pellets per year from North America.
   – Exports to Europe to triple in the next couple of years.
MARKETS:
Introduction to Current Bioenergy Markets

C) Ethanol Production
- Prototype plants up and running
- Pyrolysis will be the next step.
- Pulp & Paper industry to lead the way in this emerging market
MATERIAL:
Where will we get all this biomass?

A) Forest Residues
B) Thinnings
C) Fuel Wood Plantations
D) Urban Wood Waste
E) Agricultural Residues
F) C&D Waste
MATERIAL:
Where will we get all this biomass?

A) Forest Residues
- Majority of biomass will come from our forests.
- Strong market for low-grade fuel wood provides economic incentive to capture logging slash.
MATERIAL:
Where will we get all this biomass?

A) Forest Residues
- New equipment will be developed to collect material, bundle it into bales, and then chip or grind it into usable fuel wood.
MATERIAL: Where will we get all this biomass?

C) Fuel Wood Plantations

- Development of fast-growing harvesting-type coppice hardwood that is harvested on a short-rotation basis.
- Harvesting of straw, rape, and miscanthus for use as fuel – cut, baled, and then chipped.
- Marginal crop land could be converted back to original forest cover for biomass production.
D) Agricultural Residues
   - Orchard pruning's, rice rolls, fruit pits, and nut shells have been used for energy for years.
   - European countries using different types of agricultural grasses – hay, straw, rape and switch grass for pellet production or direct-fired systems.
MATERIAL:
Where will we get all this biomass?

E) Urban Wood Waste

– Capturing storm damaged material for use in mulch and compost.
– Emerald Ash Borer outbreaks will contribute to urban wood waste.
– Collection centers expand to capture chips, limbs and logs created from trimming and removing unwanted trees in urban areas.
MATERIAL:
Where will we get all this biomass?

F) Construction & Demolition Waste
- Diverting materials from landfills
- Converting material into mulch and raw material into fiber board.
- Pellets produced from dry wood such as pallets for its relatively low moisture content with little or no drying needed.
CASE STUDIES:
How will we convert this material into a useable form?

- Includes converting material into the right dimensions, moisture content, and cost.
- Completed a number of case studies in all spectrums of the biomass energy markets.
CASE STUDIES:
How will we convert this material into a useable form?

A) Whole Tree Disc-Style Chippers for Direct-Fired Boilers
- Capacities from 18” to 24” diameter
- Horsepower options from 250- to 700-hp
- Available with cab & loader, track undercarriage
CASE STUDIES:
How will we convert this material into a useable form?

A) Whole Tree Drum-Style Chippers for Direct-Fired Boilers
   - Capacities from 20” to 36” diameter
   - Horsepower from 250- to 1,200-hp
   - Available with track undercarriage, and cab & loader
   - Capturing logging slash at the landing or roadside will be done by whole tree chippers and grinders, depending on the cleanliness of the material.
CASE STUDIES:
How will we convert this material into a useable form?

- Hardwood and softwood thinnings will be collected and processed in a manner similar to logging slash.
- Material will be put into bundles.
- Skidders or forwarders will be used to forward material.
CASE STUDIES:
How will we convert this material into a useable form?

- Pine Star logging utilizes a Beast Recycler to produce material for pellets
- Processes logging slash that has been pushed into a pile
- Horizontal grinders are best suited for processing material that will contain dirt or rock
How will we convert this material into a useable form?

(B) Beast Knives for Pellet Production

- Cut, split and grind!
- Type of tool dependant on cleanliness of materials.
- For pellets, cutting is better than grinding due to the blocky nature of the end-product, as opposed to a fractured product made from grinding.
- Pellet production increased 10-12% when cutting as opposed to grinding.
CASE STUDIES:
How will we convert this material into a useable form?

C) Beast Knives for Direct-Fired Boilers

– Conventional 3/4” chips compared to ground material will increase payload by as much as 25%
– Using a grinder with knives as opposed to grinding tools dramatically increase production and lower fuel costs and consumption.
– Logging slash gathered at the stump will likely be processed by grinders because the material will generally contain higher levels of contaminants.
– Some slash collected by forwarders may be able to be processed with whole tree chippers.
CASE STUDIES:
How will we convert this material into a useable form?

D) Urban Wood Waste & Storm Debris
- An auxiliary supply source.
- Recycling yards and landfills in major cities produce mass quantities of wood biomass.
- 50mW plant in Flint, MI is fueled primarily from urban wood waste and construction waste.
- Hurricanes, ice storms, and wind storms generate significant quantities of wood waste.

BANDIT INDUSTRIES, INC.
CASE STUDIES:
How will we convert this material into a useable form?

E) Beast with Knives for Sawdust Production

- Breakthrough technology for producing fine 1/4”-minus chips
- Ideal for pellet production
- Should be more attractive for direct-fired systems and biofuel plants
CASE STUDIES:
How will we convert this material into a useable form?

Biosawdust:
- 1/4” minus in size
- As much as 80 tons/hour produced
- Only a minor increase in fuel consumption
Summary
Closing Remarks: Bandit Facts

- 240,000 square foot manufacturing facility
- 170 dealer locations worldwide
- Over 45,000 machines in operation
- Celebrated 25th anniversary in 2008