Realistic Expectations for Woody Biomass Utilization

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Tulare, May 5 2009

Overview

Purpose:

- Look at what makes sense from a utilization perspective for woody biomass
- Based on challenges and opportunities that is possible today

Today's technology that is capable of delivering benefits in the short term:

- Reducing wildfire risk
- Enhancing forest health
- Delivering value to communities

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"A tree is a tree - how many more do you need to look at"

Ronald Reagan, California Governor

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Woody biomass



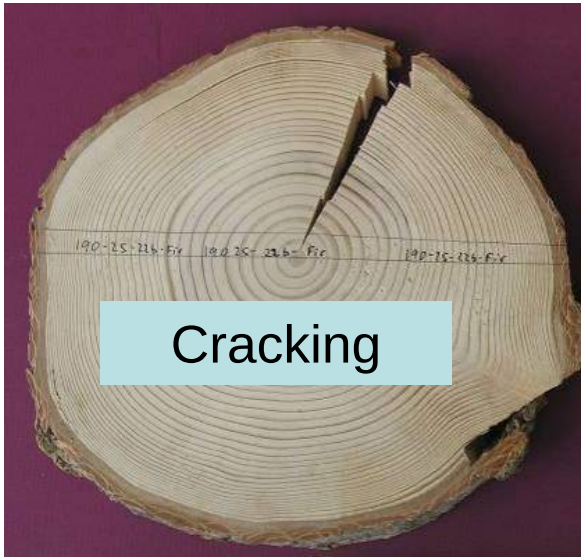


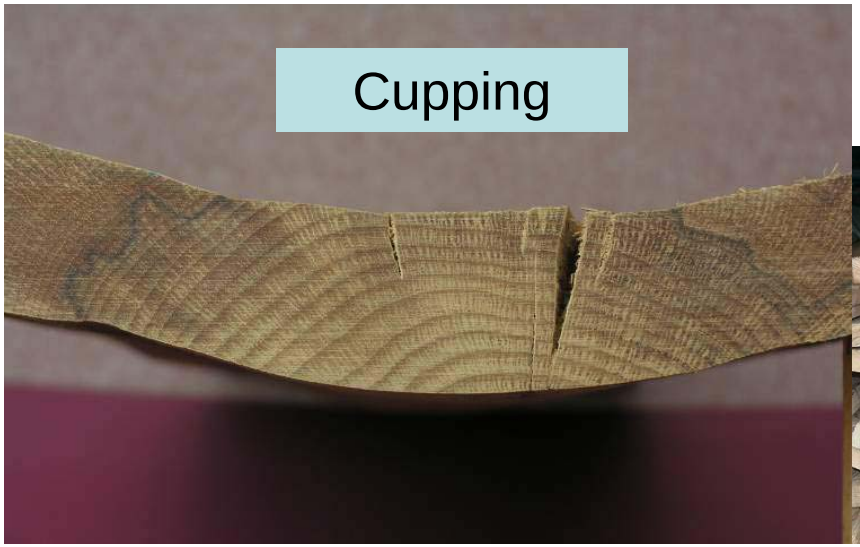


Changing public land management

Problems with smallwood?

- Raw material properties
  - Juvenile wood
  - Differential shrinkage
  - Knots
- Processing Cost
- Transportation cost





Raw material form is important

Every process has a raw material specification

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Scale of markets vs biomass availability

- **Bulk (100,000+ ton/yr)**
  - A monster to feed?
  - Long term (~10 years) supply commitments required in order for investment to happen
  - Hedge risk with diversified feedstock supply
- **Small-medium markets (<60,000 ton/yr)**
  - Smaller investment (less risk?)
  - Local sourcing (can be located closer to the resource)
  - Local markets
  - Adding value to communities

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What can technology do?

Almost anything!

But:

- Is it commercially proven
- Economics
- Quality control
- Environmental issues
- Raw material supply
- Market for product

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Location is important

- Are there existing markets for woody biomass?
  - Powerplants
  - Sawmills
  - Particleboard
  - Pulp
  - Others…

  - What do they pay?
  - Feedstock specification?
  - Opportunity to adapt?

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Opportunities in California

- Potential conversion opportunities:
  - Small diameter sawing
  - Roundwood
  - Densified wood fuels
  - Niche chip/shaving products
  - Heat
  - Power plants (CHP)
  - Liquid fuels?

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Small diameter sawmilling

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Round Wood (Stronger and More Stable)

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Connections are Difficult-Costly

Slide provided by USDA Forest Service, Forest Products Lab

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Post and Pole – more realistic for now

- Low tech
- Low investment
- Good market in California

Post and Pole key figures

- Site size - 3-5 acres
- Investment - $750,000+ (ex land and permits)
- Equipment - typically 1 peeler and 1 doweler (production ~1,200 - 2,000 pieces per day)
- Raw material – lodgepole pine, ponderosa pine (treatability, availability, lower taper and smaller knots), White fir and douglas fir less desirable (treating and shipping weight issues)
- Typical plant needs 10,000-20,000 tons/yr (depending on plant efficiency)
- Employees – 10-15
- Market Trends - lower Canadian dollar and lower fuel prices mean that there are more Canadian imports and competition
- Other considerations:
  - Residuals market (eg animal bedding, hog fuel and firewood)
  - Sorting/merchandizing system (small processors in yard vs automated sort systems with multiple bins)
  - Treatment plant – onsite or send elsewhere?

Source: Larry Swan, USFS

Breaking wood down into particles minimizes the impact of defects (knots, juvenile wood, insect galleries etc.)

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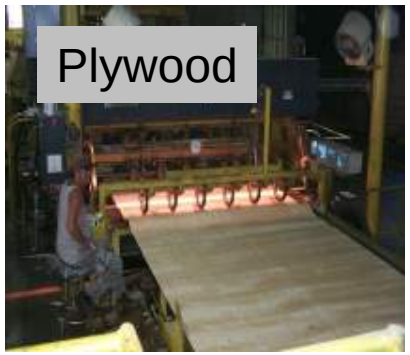
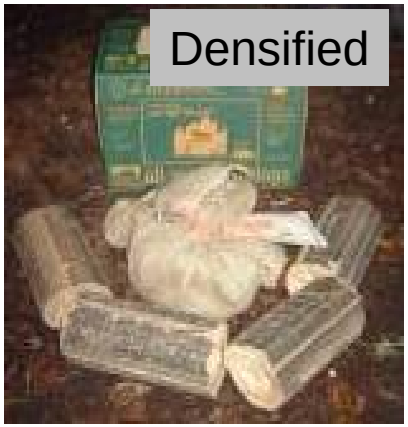
Creating uniformity





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Densified Wood Products

More detail tomorrow…

Niche woodchip and shavings

- Animal bedding (shavings) ($1m)
- Chip (bio-filtration)
- Chunk chip (cattle corrals) ($60k)

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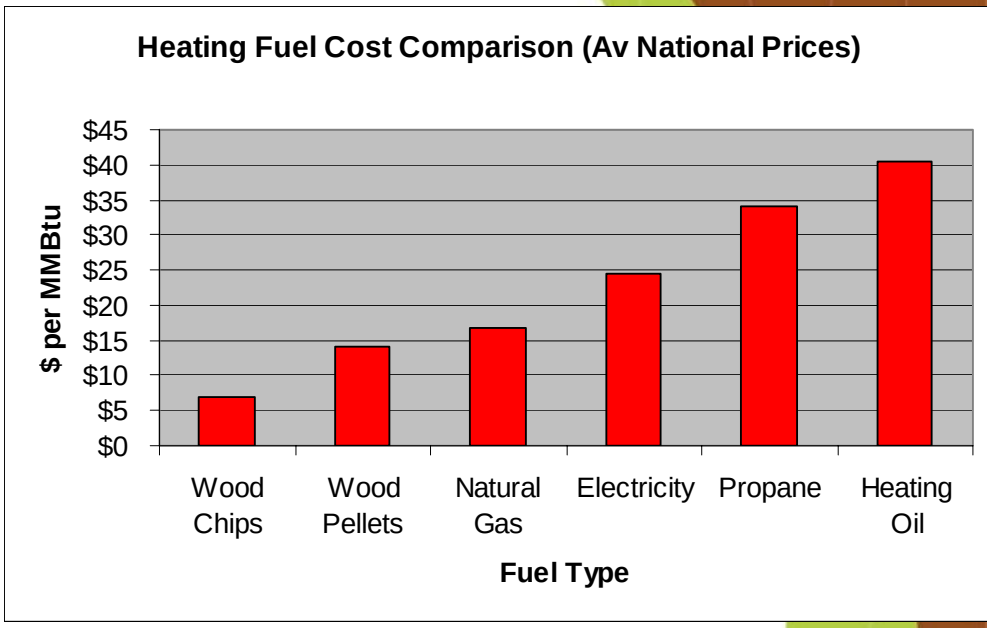
Small scale heat (institutional)

- Can be cheaper than alternatives – it is easy to calculate simple payback
- Carbon neutral
- Local market
- Opportunities for public buildings (10,000 sq ft to 1m+ sq ft)
- Air quality permitting can be an issue
- Long payback period may be a problem (5-15+ yrs)



Source: US DOE Energy Information Administration, Sept 08

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Powerplants

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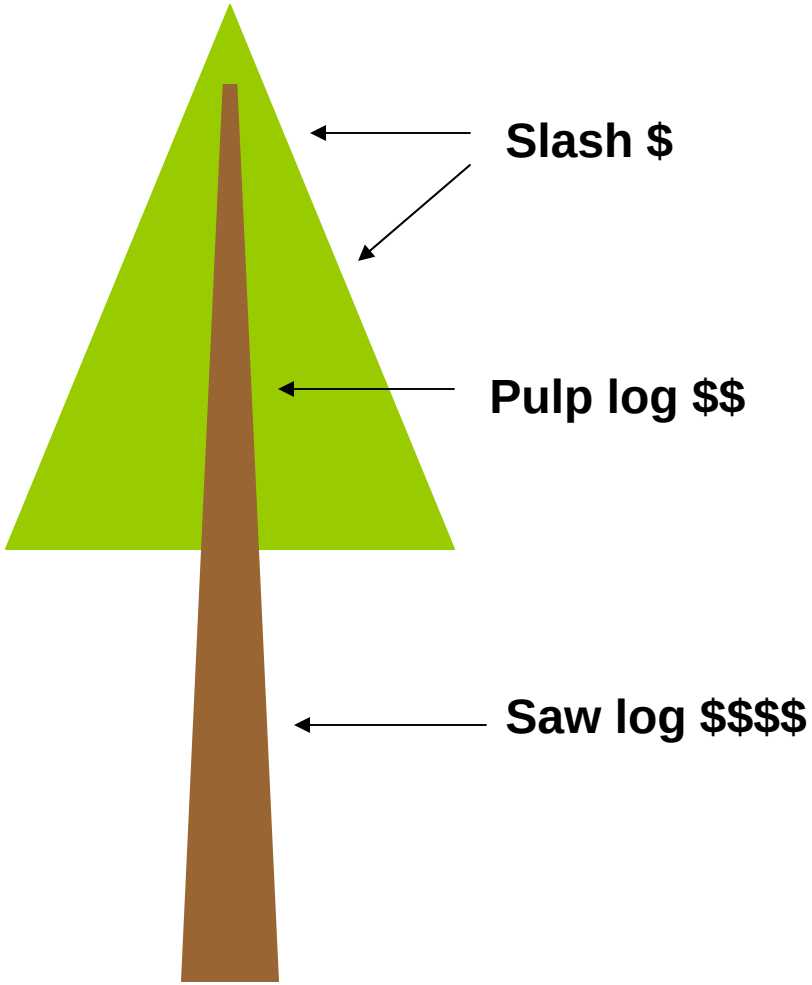
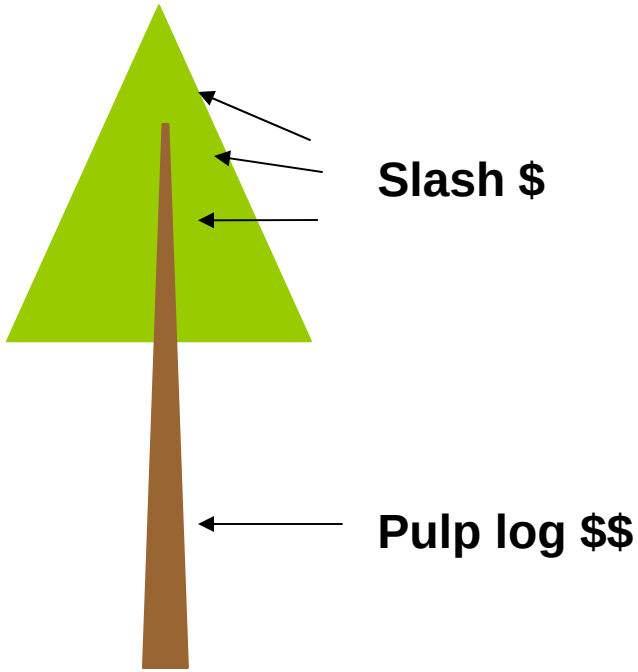
Value helps to move residuals





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Conclusions

- There are lots of product opportunities
- Different raw material value for different products – value is required to move the material
- Raw material supply is crucial for new investments and to maintain existing infrastructure

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