Woody Biomass Utilization in Southern California

Workshop

San Bernardino, CA

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Southern California
Woody Biomass – What is it ?

Southern California Woody Materials

- BIOMASS
  - Drought-stressed trees and drought-induced tree mortality
  - Urban woody waste
  - Manufacturing woody residues
  - Urban tree residue
  - Wildfire fuel reduction residues
- TIMBER
  - Mountain top forest timber management
    - Public timberland
    - Private timberland

Southern California Woody Materials

What do we have?

Southern California Woody Materials

What do we have?

A disposal problem?

Southern California Woody Materials

What do we have?

A disposal problem?

Or

Southern California Woody Materials

What do we have?

A disposal problem?

Or

A raw material resource?

A disposal nightmare

Air Curtain Burner – an incinerator

A Wildfire Hazard

A resource

Hospital flat – Lake Arrowhead

What can we do with the Southern California Woody Biomass ?

Characteristics of Impacted Species						
Species	S. G.	Estimated Market Value in 2004 ($ / MBF, FOB Landing)			Percentage of the total mortality	Comments
		High	Paint Grades	Low		
Ponderosa pine					19	highest grades commonly used for molding and millwork, lower value used for common boards and pallet stock
Pinus ponderosa	0.38	480	300	120		
Jeffery pine						
Pinus jeffreyi	0.37	480	300	120		
Sugar pine					8	
Pinus lambertiana	0.34	480	300	120		
Coulter pine					10	low strength properties, brash nature, very little value as lumber
Pinus coulteri	*na*	60	60	60		
Pinyon Pine					10	small trees, important habitat species, no lumber value
Pinus quadrifolia	na	na	na	na		
Big cone Douglas-fir					6	~ 15% lower mechanical properties than *P. menziesii*
Psuedotsuga macrocarpa	0.45	na	na	na		
White fir					37	Structural lumber, studs, some fencing if preservative treated
Abis concolor	0.37	240	na	120		
Incense cedar					0	not impacted by drought/beetle, removed as fire salvage or fuel reduction
Libocedrus decurrens	0.35	600	na	600		
Other (minor hardwoods)	--	na	na	na	10	firewood is only hardwood market in So. Cal.

na = not available or no developed market exists

What can we Do with Woody Biomass?

What can we Do with Woody Biomass?

Grind it

Chip it

What can we Do with Woody Biomass?

Grind it

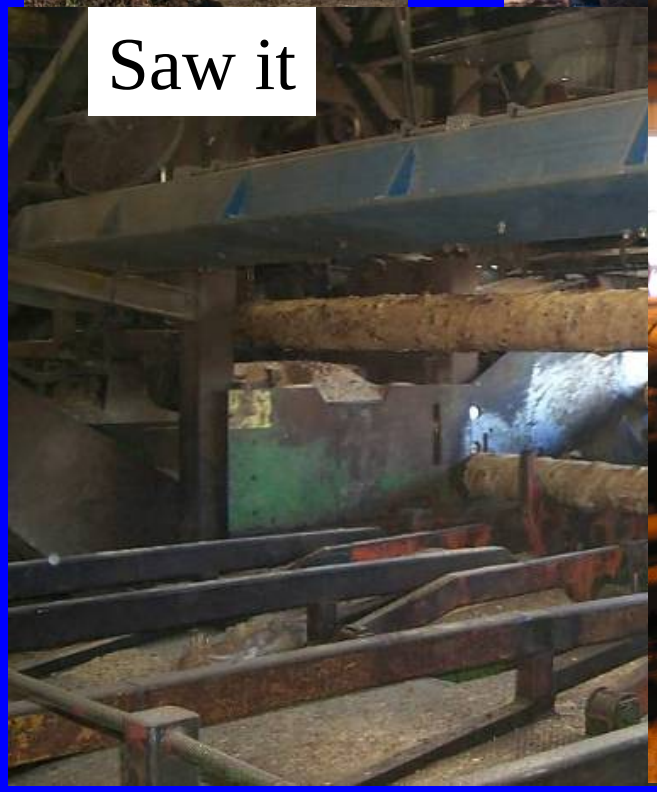
Chip it

Burn it

What can we Do with Woody Biomass?

What Can We Do with Woody Biomass?

What Can We Do with Woody Biomass?



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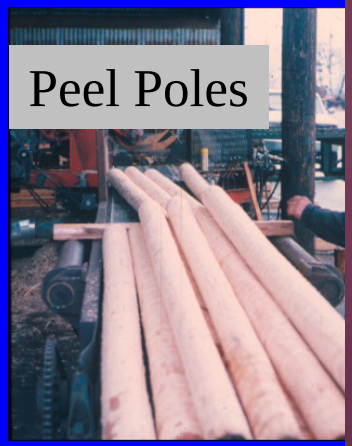
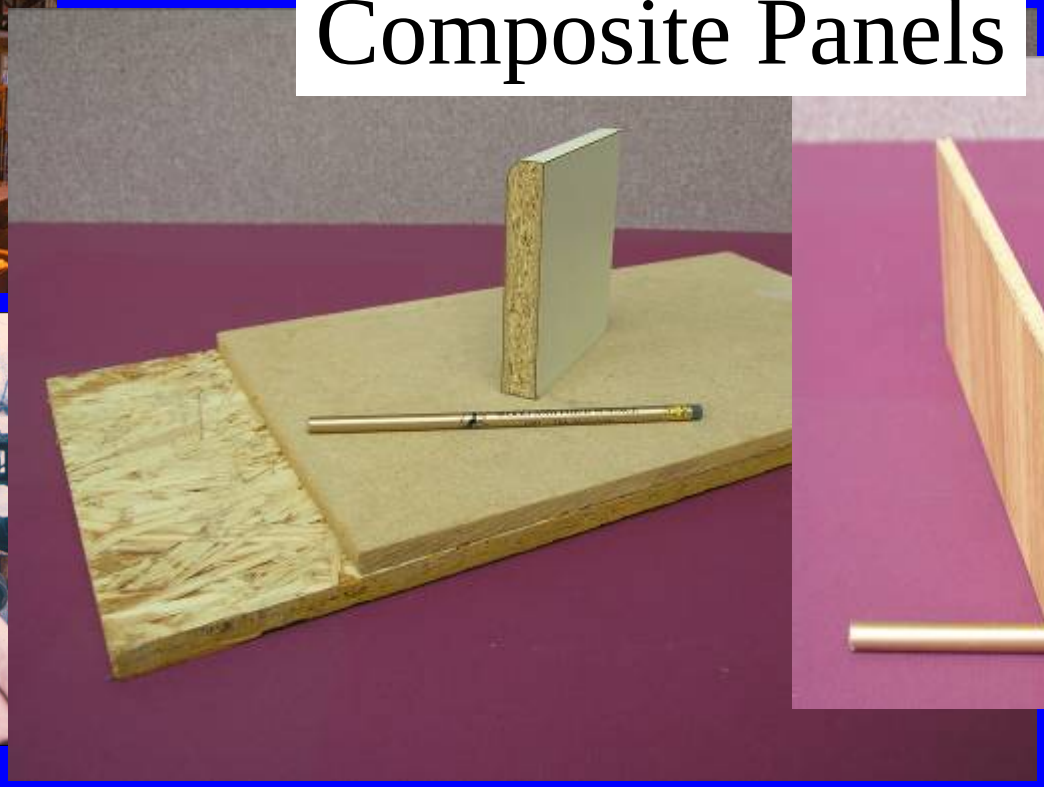
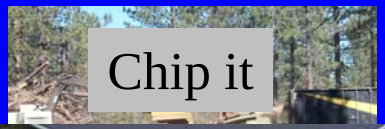
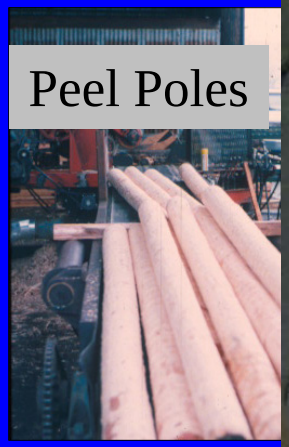




What Can We Do with Woody Biomass?





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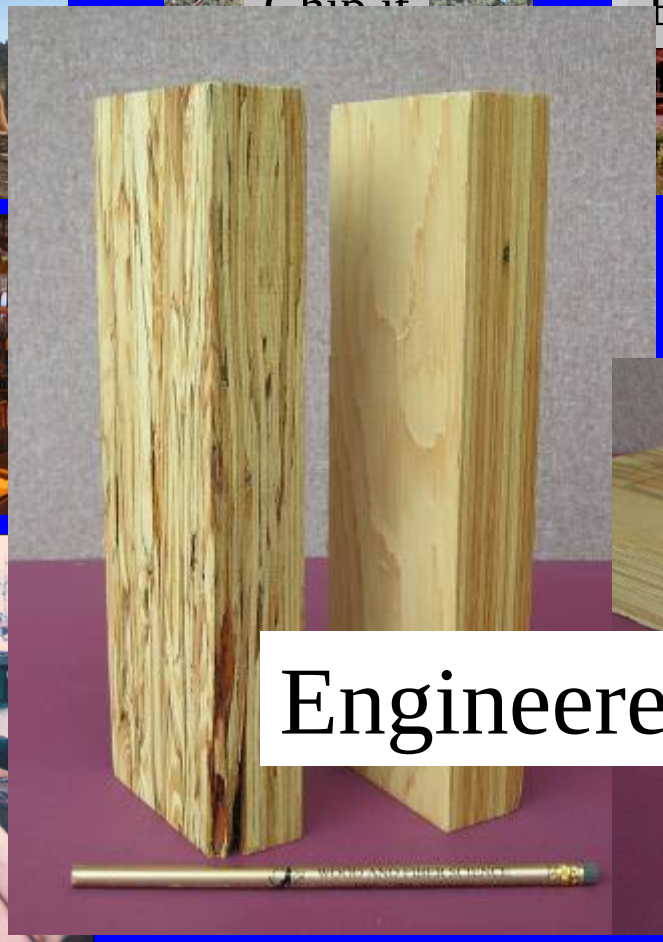


Make Plastic

Engineered Lumber

What Can We Do with Woody Biomass?

Make Organic Chemicals

Wood = C + O + H

State of the Industry in 2002

- Landscape and soil amendment (950,000 GT)
- Biomass powerplant (850,000 GT)
- Firewood (1,000 GT)
- Sawlogs transported out of region (5,000 GT)

Response to the Crisis

- Government – incentives to remove dead trees and establish new businesses to use material
  - USFS State and Private Forestry, NRCS
- Outreach – Encourage established businesses from other areas of state to purchase So. CA logs and biomass
- Private Sector – Utilities and landowners contracting for tree removals and fuel reduction

Expanding Firewood Production

Log sort yards and portable sawmills

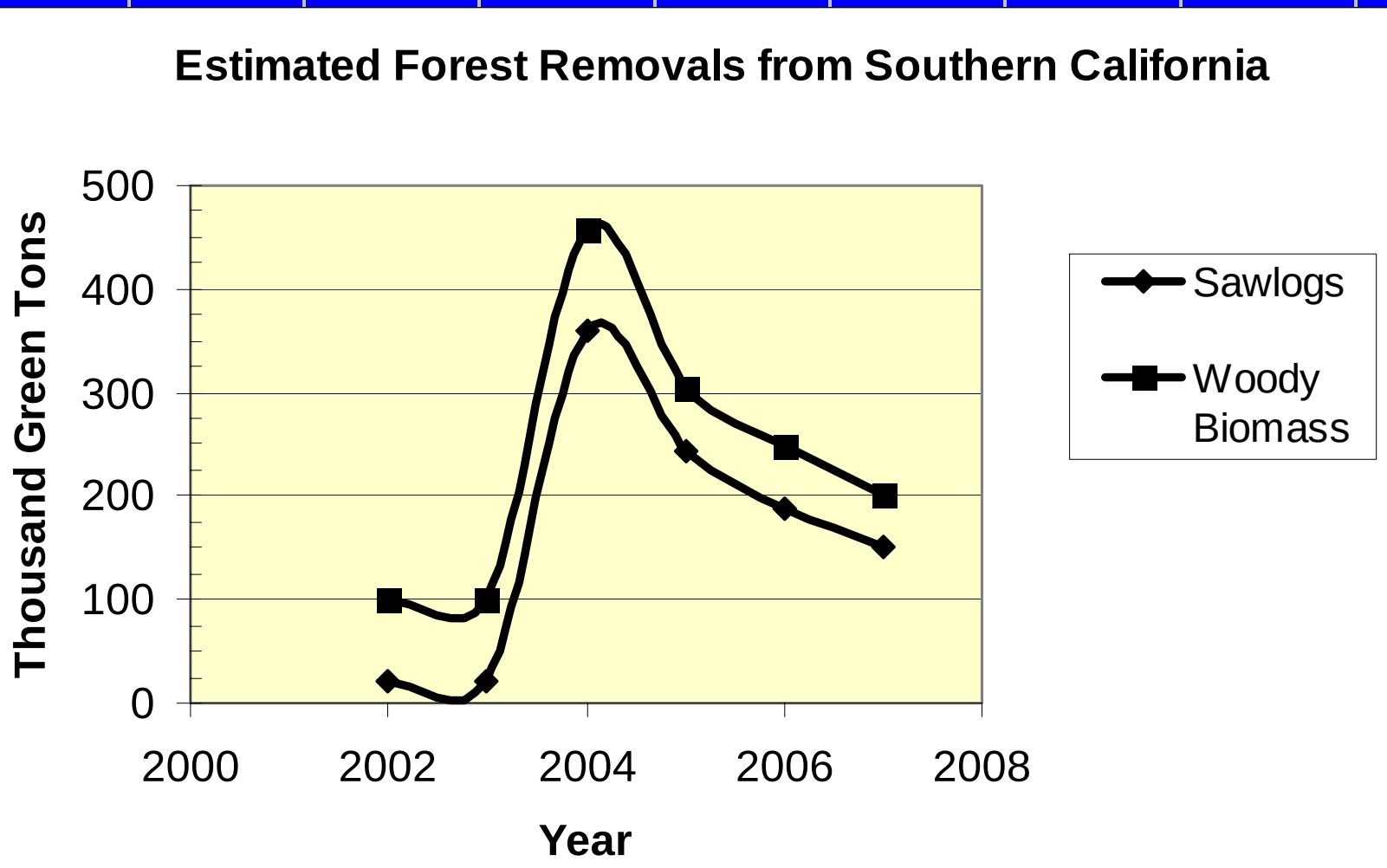
New sawmills

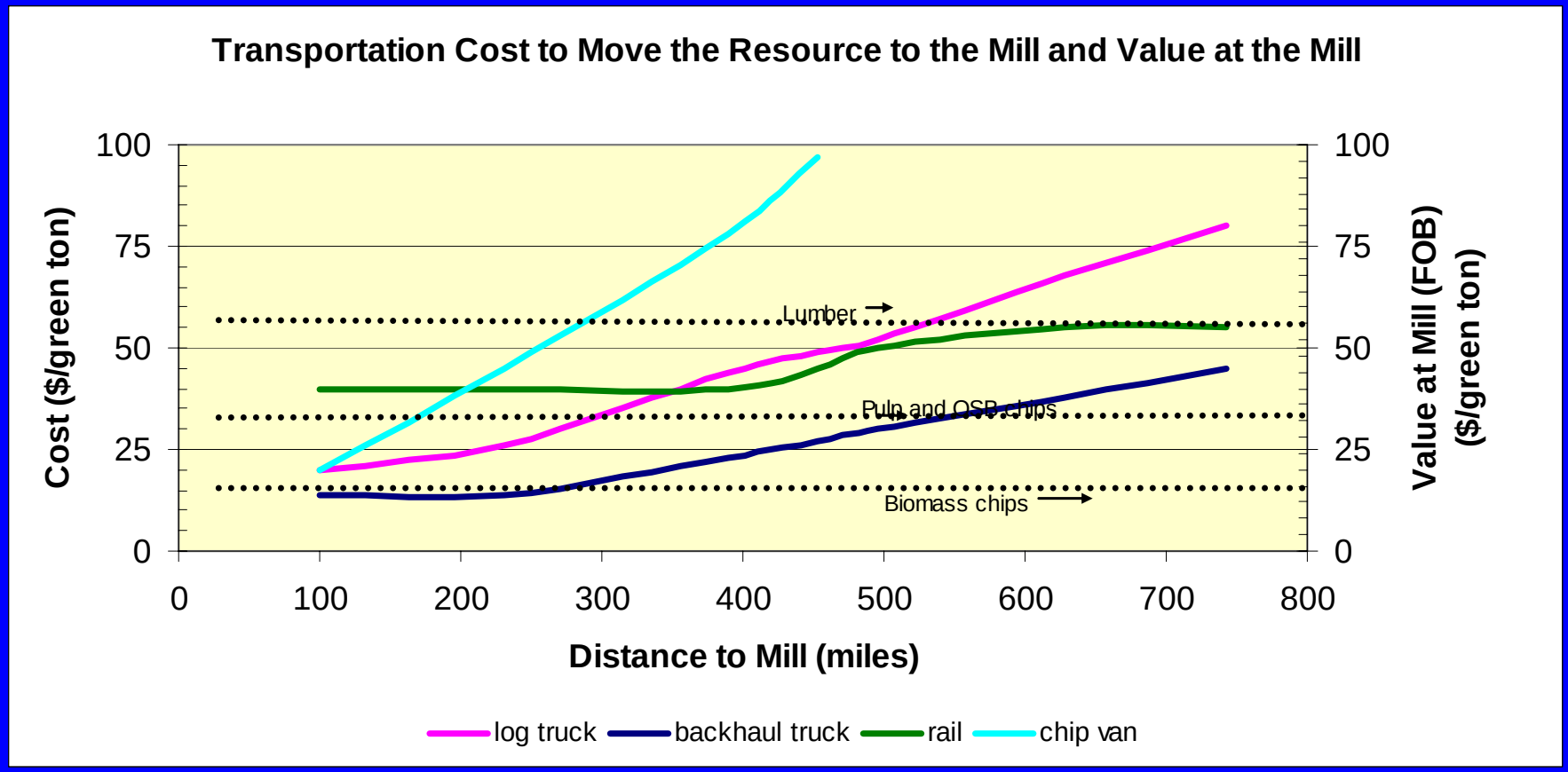
Rail car transport of logs

Southern California Forest Product and Biomass Markets	Resource Consumption by year and source (thousand green tons)							
	2003		2004		2005		2006	
	Urban	Forest	Urban	Forest	Urban	Forest	Urban	Forest
Sawlogs (transported out of region)	--	10	--	444	--	244	--	200
Local Lumber production	--	20	--	217.5	--	174	--	100
Composite panels	--	--	--	--	--	--	--	--
Firewood	--	1	--	10	--	7.5	--	6
Biomass chips	850	5	870	80	690	45	695	40
Landfill cover and Erosion Control	800	--	830	--	830	--	830	--
Compost/Mulch	150	--	197	--	200	40	200	40
TOTAL	1800	36	1897	751.5	1720	510.5	1725	386

Total Forest-based **1684** MGT

Total urban-based **7142** MGT


Estimated Forest Removals from Southern California
Thousand Green Tons
500
400
300
200
100
0
2000
2002
2004
2006
2008
Year
Sawlogs
Woody Biomass


Transportation Cost to Move the Resource to the Mill and Value at the Mill
Cost ($/green ton)
Value at Mill (FOB) ($/green ton)
100
75
50
25
0
Lumber
Pulp and OSB chips
Biomass chips
0
100
200
300
400
500
600
700
800
Distance to Mill (miles)
log truck
backhaul truck
rail
chip van

So What's the Problem?

So What's the Problem?

- Resource Availability
- Processing Cost
  - Extraction, Transport, Manufacturer
- Product Quality

Challenges for Manufacturing Biomass-Based Products

- Insure a Long-Term Supply of Biomass Raw Material
- Overcome Material Property Limitations (biomass is a low quality raw material)
- Reduce the High Handling and Production Costs
- Improve Processing Knowledge
- Develop New Markets or Market Share