

California Wood & Biomass Utilization Infrastructure Status, Trends & Opportunities

Board of Forestry
October 1, 2015

Larry Swan, U.S. Forest Service
R05 State & Private Forestry, Vallejo, CA



Today's outline....

- Context, S&PF Wood & Biomass Involvement & Useful Definitions
- Looking Back, Sawlogs & Biomass Utilization, 1972 vs 2012
- Current Status, Primary Processing & Biomass Utilization
- Forest Biomass Utilization Trends & Opportunities
- Crisp Conclusion



Why is S&PF Involved with Wood & Biomass Utilization?

- Long History – In CA, started in 1905 with UC Berkeley contacts.
- S&PF – S&PF staff involved beginning 1960s.
- CAL FIRE - Involved with utilization since at least 1970.



USFS R05 Wood & Biomass Utilization Mission

- Retain a competitive and resilient wood products industry infrastructure to help accomplish ecosystem restoration objectives, create and retain jobs, and partially defray management cost.
- Investments – From 2004-2015, about \$33.3 million in businesses, non-profits, state agencies, collaborative groups and extension.



Larry's Useful Definitions

- **Biomass** – Residuals from forest management, wood processing, urban sources (e.g. construction & demolition debris, prunings and tree removals), and agricultural activities and processing. Woody biomass is usually either ground or chipped (i.e. cut) into smaller particles.
- **Forest Products Infrastructure** – Includes management, harvest, transportation, processing, marketing, distribution, and related support, such as financial/insurance services and equipment/supplies vendors.
- **Primary and Secondary Processing** – 1° processing refers to conversion of logs to lumber, chips, ground material, and pulp and other products. 2° processing refers to further processing and adding value to 1° products.
- **Board Mill** – Used in reference to composite panels, including particle board, hardboard, medium-density fiber board (MDF) and oriented strand board (OSB).



Looking Back Utilization Infrastructure 1972 vs 2015

Obvious and Less Obvious
Changes – Supply quantity
and characteristics, federal
and state environmental
laws and regulations, and
technology and markets
(i.e. shake/shingle mills).



Old Skidder:

<http://www.vannattabros.com/1973pics/lc14wag1.jpg>

Changes in Supply Sources, Harvest Levels, and Sawmill Production

Log Sources			
Year	USFS	Private	Other Public
1972	41%	56%	3%
2012	14%	83%	3%

Total Harvest, Sawmill Log Consumption & Production			
Year	Log Harvest	Sawmill Log Input (Eastside Scribner)	Sawmill Production (Bd. Ft. Tally)
1972	5,450 MMBF	4,695 MMBF	5,400 MMBF
2012	1,425 MMBF	1,180 MMBF	1,900 MMBF
Percent Change	-75%	-75%	-65%

California Forest Industry Wood Consumption and Characterization, 1972 (Howard 1974); California Forest Products Industry and Timber Harvest, 2012 (McIver et al. 2015).



Changes in Primary Processing Facilities & Markets

California Primary Processing Facilities

Year	Saw-mills	Veneer &/or Ply-wood	Pulp &/or Paper	Board (Com-posite Panel)	Shake & Shingle	Posts, Poles & Pilings	Bio-energy	Mulch, Firewood & Other (e.g. Animal Bedding)
1972	176	25	9	9	7	6	0(?)	0(?)
2012	30	2	0	1	0	1	26	11(?)
Percent Change	-83%	-92%	-100%	-89%	-100%	-83%	Sub-stantial	Substantial

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Why Are There So Many Biomass Power Plants in CA?

- PURPA of 1978, publicly-owned utilities purchased electricity at avoided cost of generation
- Numbers peaked in late 1980s or early 1990s (63 plants, 900+ MW), contracts changed to short-run avoided cost (SRAC), i.e. market price



Changes in Primary Processing Efficiencies

Sawmill Efficiency & Average Annual Production		
Year	Lumber Recovery Factor (LRF)	Avg. Annual Production
1972	7.38	30.7 MMBF
2012	8.87	63.3 MMBF
Percent Change	17%	52%
LRF - Lbr. output (bf tally) divided by lbr. input (cubic ft)		
Overrun - Lbr. output (bf tally) divided by lbr. input (bf Scribner)		

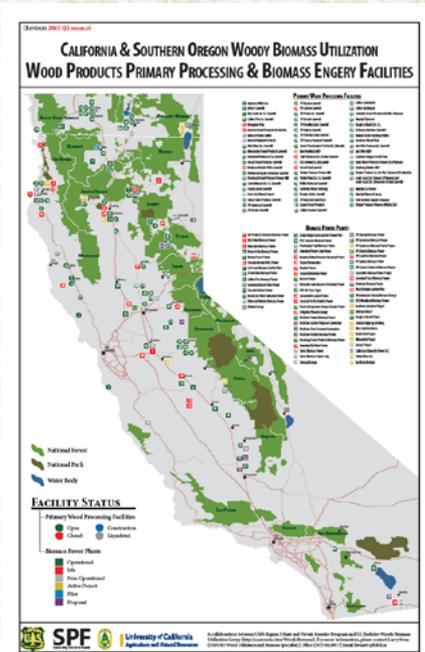
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Current Status, Primary Processing Infrastructure

2015 California Primary Processing Facilities That Use Logs

Sawmills	Veneer	Bioenergy	Particle Board	Posts & Poles	Whole Log Shaving	Portable Chippers & Grinders
27	2	24	1	2	1	(?)



What Facilities are Included in Forest Biomass Infrastructure?

1. Biomass Power Plants
2. Sawmill & Veneer Plant Energy Use
3. Particle Board



Other Forest Biomass Users

4. Mulch and Soil Amendment Producers
 - a. Bark Mulch
 - b. Specialty Mulches (e.g. playground, Cal Trans etc.)
 - c. Soil Amendments (e.g. compost)



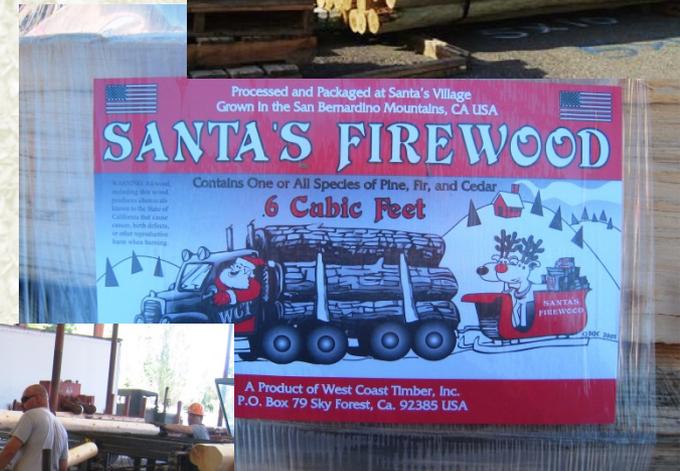
Other Forest Biomass Users

- 5. Industrial Compost Producers (e.g. biosolid users)
- 6. Biofilters



Other Forest Biomass Users

- 7. Post/Pole Manufacturers
- 8. Firewood



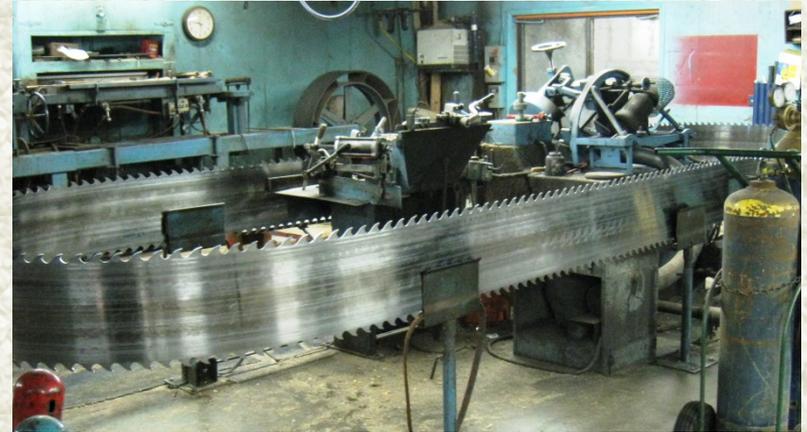
Other Forest Biomass Users

9. Cement plants



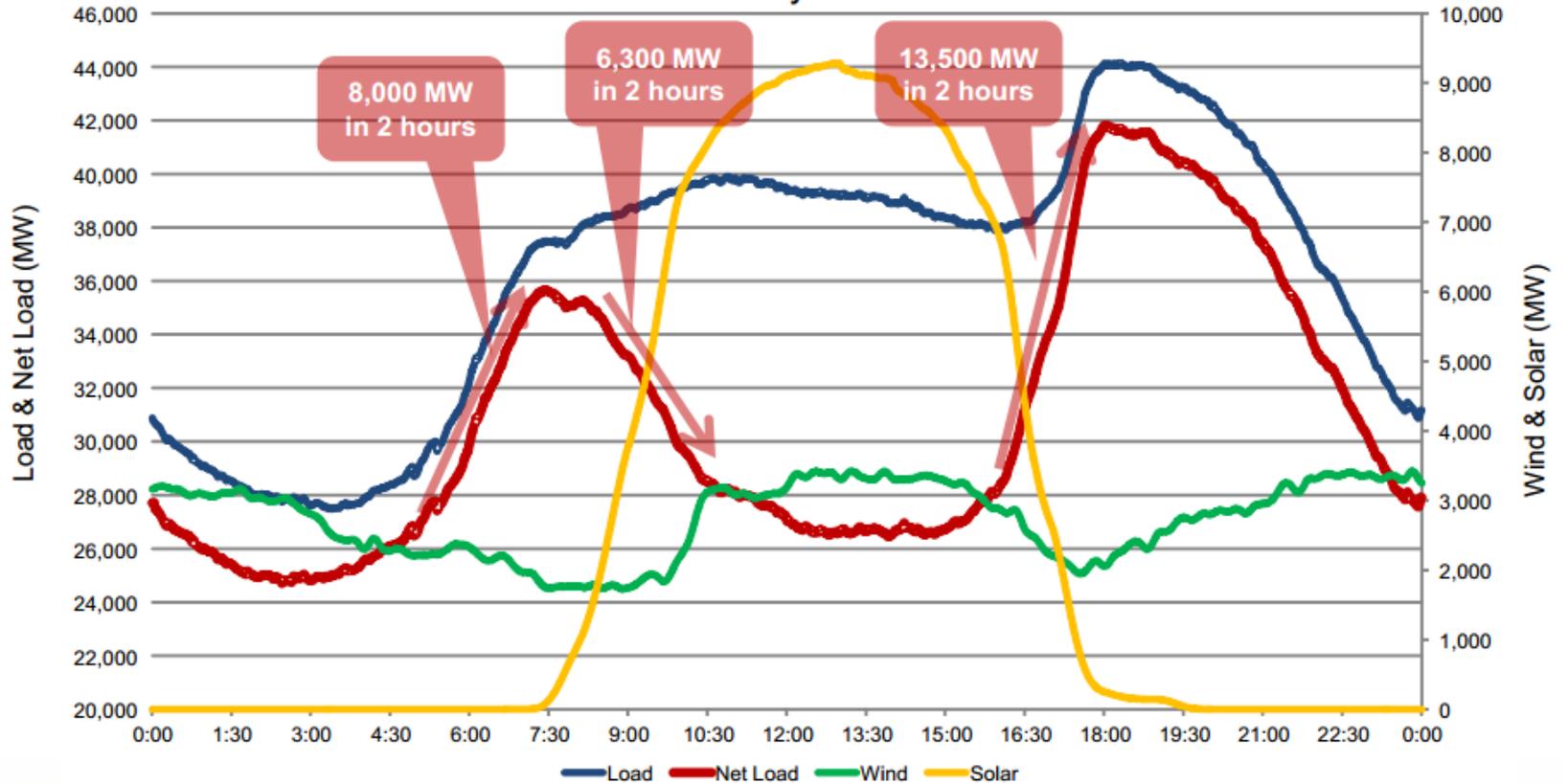
High Priority Emphasis Areas for Forest Biomass Program

1. Existing biomass power plants (operational & idle)
2. Existing sawmills, veneer plants & particle board plant
3. SB 1122 projects
4. Carbon & GHG discussions



The Duck Back Graph

CAISO Load, Wind & Solar Profiles – High Load Case
January 2020



Developing Forest Biomass Technologies and Markets

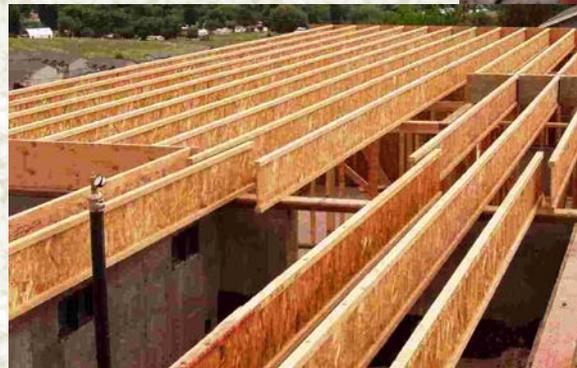
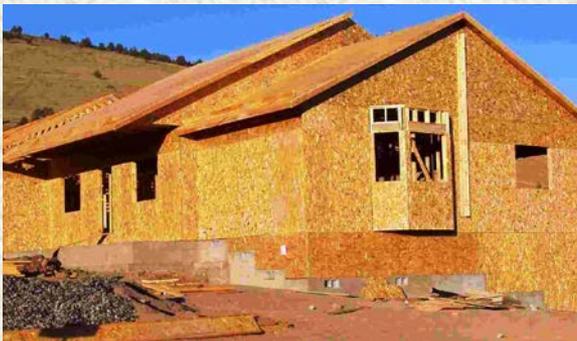
1. Gasification, fast pyrolysis, air curtain burners, and portable adaptations
2. Liquid fuels
3. Biochar
4. Nanotechnology



Prelim. Results of Statewide Wood Opportunity Assessment

Workshop, UC Davis, Oct 19, 2015

- 1) Cross-Laminated Timber (CLT)
- 2) SB1122 + Co-Located Businesses
- 3) Green Veneer
- 4) OSB (?)



Crisp Conclusion

- Biomass utilization is economically difficult and getting more difficult, but the need is increasing.
- Critical to engage other affected constituents (e.g. ag. and urban) as biomass power plant contracts expire.
- Short-term priorities will be fire salvage, insect/disease mortality and thinnings, and better definition and outreach of biomass benefits.
- USFS will keep door open to new technologies and opportunities.
- Wouldn't mind more company, both figuratively and financially.



Contact Information

Larry Swan

Wood & Biomass Utilization Specialist

USDA Forest Service, Vallejo, CA

lswan01@fs.fed.us

707-562-8917



Other Slides

