

Biomass Utilization in the Southern Sierra Nevada

Current Status and Observations About Potential Emerging Markets

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Outline

- Definitions and Terminology
- Current Status – State of California Primary Processing Industry Infrastructure for Forest Trees
- Status - Central & Southern Sierra Nevada Primary Processing Industry Infrastructure
- Trends - Southern Sierra Nevada
- Emerging Utilization Pathways



Useful Definitions and Terminology

- Biomass
- Forest Products Infrastructure
- Primary and Secondary Processing
- California-Specific Terms
- Forest Metrics and Nomenclature



Current Status of California Wood Products Primary Processing Industry



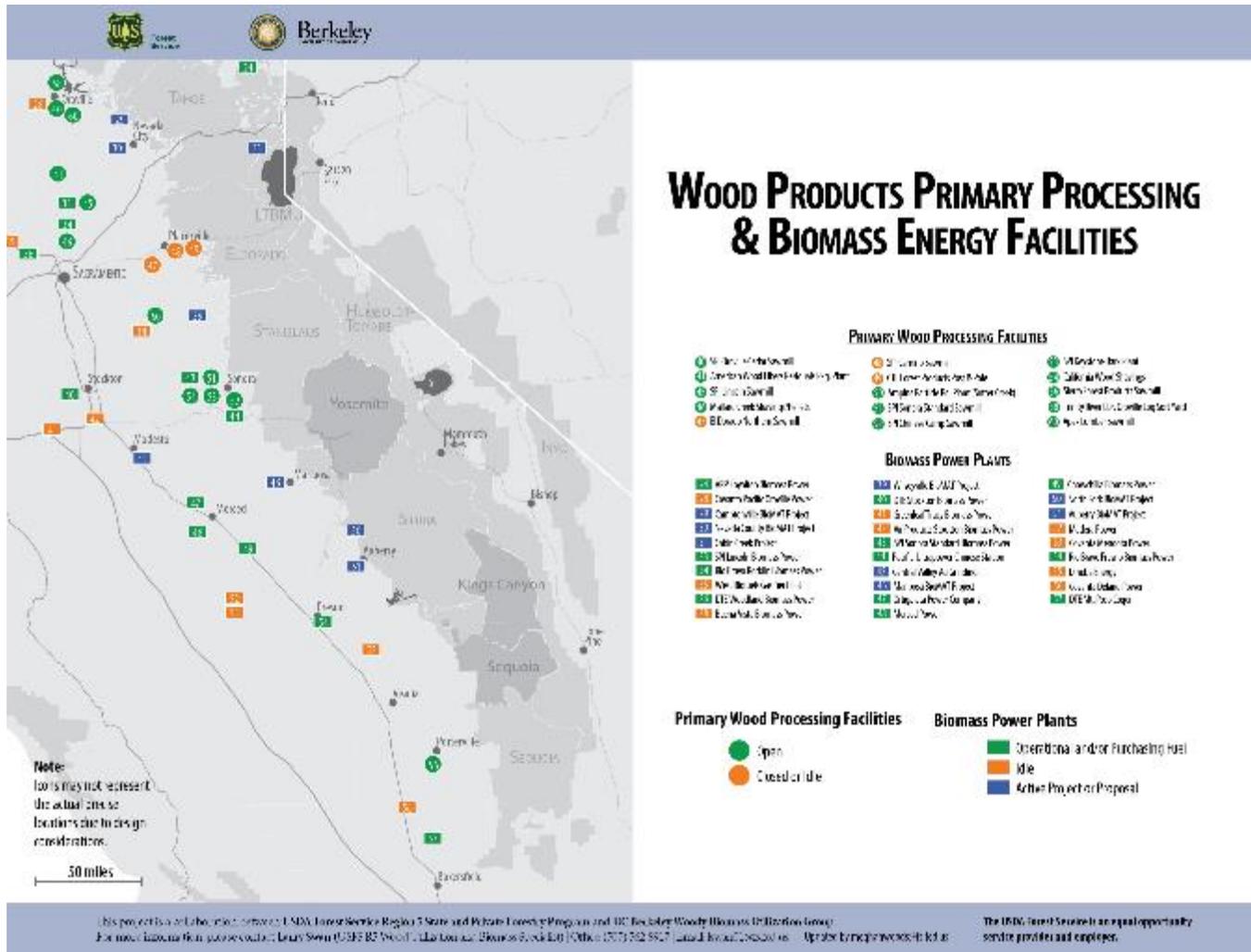
California Wood Products Primary Processing Infrastructure (July 2018)

Wood Products Primary Processing Infrastructure

Geographic Area	Sawmills	Veneer Plants	Post & Pole	Board Plant	Whole Log Shavings Mill	Total
Central & North Coast	12	0	0	0	0	12
Northern Calif.	8	2	2	0	0	14
Central & Southern Sierras	4	0	0	1	1	6
Southern CA	1	0	0	0	0	1
Total	25	2	2	1	1	33



Central & Southern Sierra Nevada Forest Products Industry Infrastructure



Utilization Options for the Central & Southern Sierra Nevada

- Post & Poles
- Animal Bedding
- Densified Wood Products (fuel pellets, bricks, logs and briquettes)
- Private Landowner Log Exports

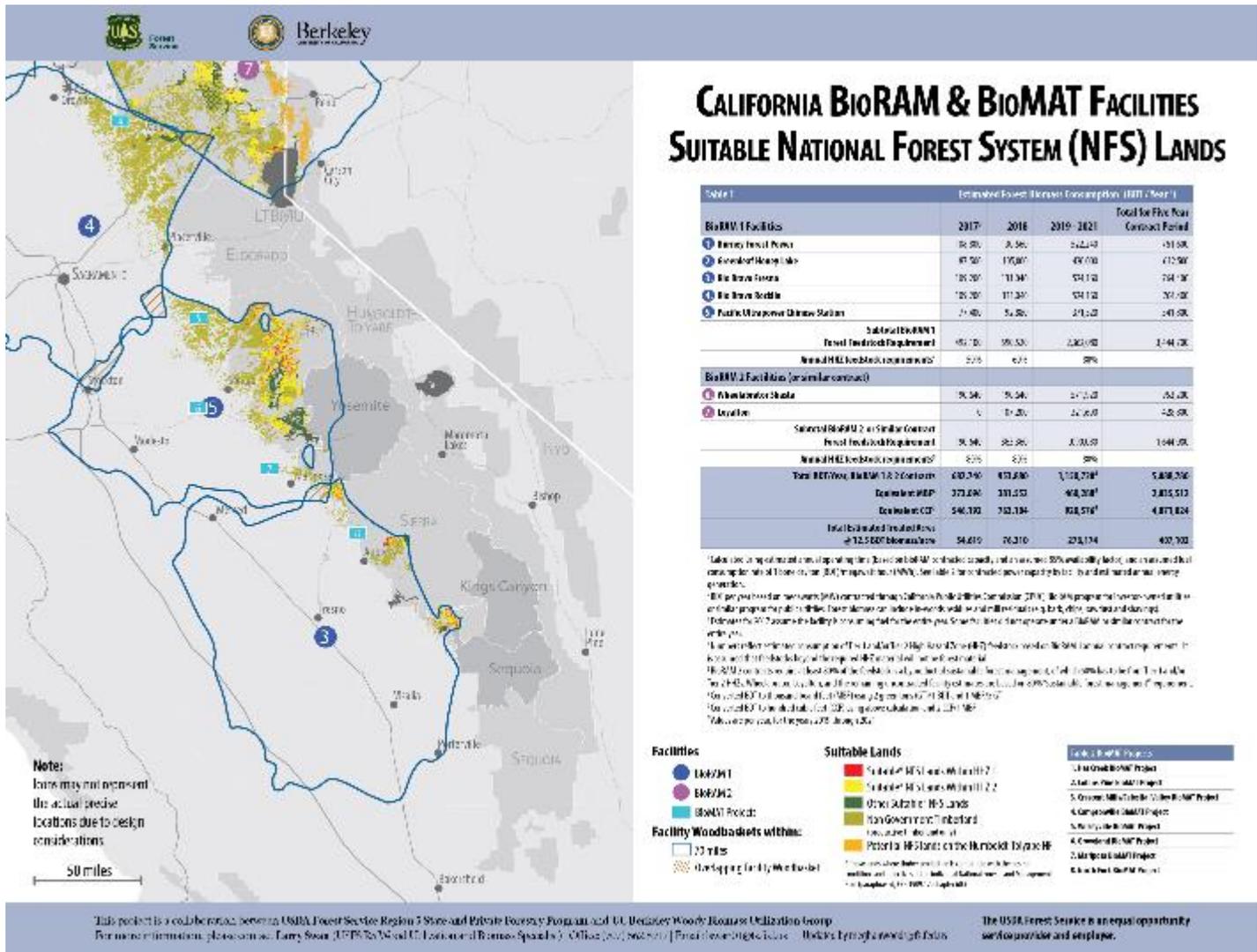


Potential High Volume Wood Utilization Options

1. Export Pellet Plants
2. Cross-Laminated Timber (CLT)
3. Oriented Strand Board (OSB)



High Volume Wood Utilization, BioRAM Contract Facility Example



What Else is Being Tracked or Promoted?

1. Gasification, Fast Pyrolysis and Portable Technologies
2. Liquid Fuels
3. Biochar
4. Nanotechnology
5. Torrefaction
6. Cement plant co-firing



Conclusion

- **Lack of Wood Scientist Expertise in California** – Need to better understand rate and extent of wood fiber breakdown to better predict potential impacts to public and firefighter safety (i.e. tree strikes and falling limbs). This affects commercial operations, such as falling, yarding, transportation and processing.
- **Better Planning is Necessary to Economically Remove Biomass** – The lower the value of logs and other fiber, the higher the risk that small decisions will negatively impact the ability to remove material. This includes project layout, directional falling, bucked lengths, and type of access to cull decks and slash piles.
- **Forest Industry Infrastructure in Southern Sierra Nevada** – Loss of any one of current facilities will pose large challenges for active management. Very little competitive overlap.
- **Logging and Transportation Infrastructure** – Recent jump in forest biomass demand because of BioRAM contracts, fire salvage and other circumstances did not stimulate significant increase in logging and transportation infrastructure..
- **Big Biomass Development Possibilities** – More difficult in southern Sierras than northern due to transportation and access to inland ports.



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