



# The Wood Waste Crisis in California and what we can do about it

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## Challenges to wood waste removal and forest thinning practice in CA

- Agricultural and Urban wood waste overload
- Fuel reduction thinning in Forest Setting
  - Plans to increase treatment from 100,000 acres/yr to >500,000 acres/yr
  - Upside-down economics: revenue (wood products) < treatment cost
    - Slope, access, environmental restrictions
    - Dwindling forest management contractor industry expertise
    - Limited markets for excess biomass
    - Conservation group legal challenges
    - Unable to monetize all “avoided” benefits – reduced air pollution, fire fighting, watershed and ecosystem damage
- Traditional waste option: existing Biomass energy Industry
  - Not cost competitive with natural gas, other renewables
    - Fuel costs high due to processing and transport
  - Contraction of existing industry
  - Lack of understanding by environmental groups and other relating to life cycle analysis



## The options for wood waste disposal

- Chip and disperse
- Mulch, compost
- Wood products
- Air Curtain Incinerators
  - provide reductions in PM and black carbon, but not NOx
- Existing biomass infrastructure
  - BACT
  - New PPA agreements procuring 125 MW, use of CPUC RAM process for forest waste/displacement of ag waste issue
- New advanced technology in bioenergy
- Open Pile Burn

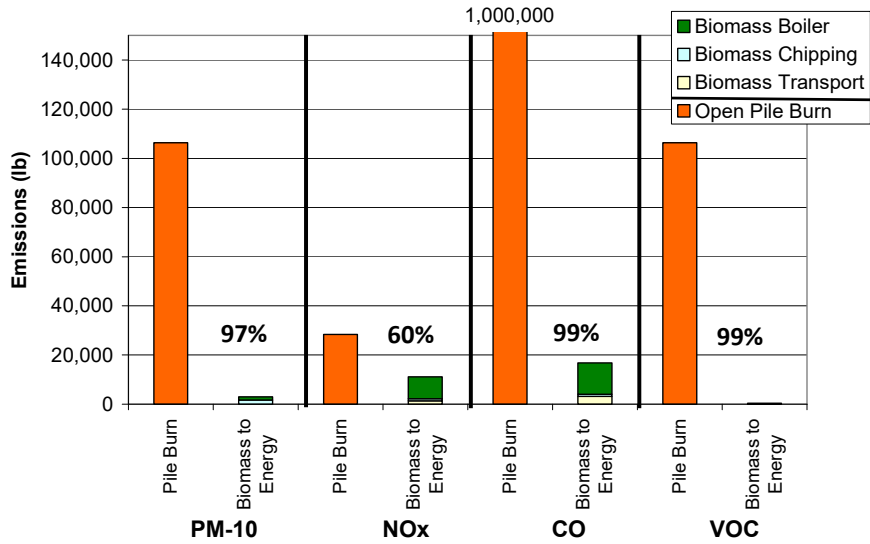


## Open Pile Burning as a waste disposal method

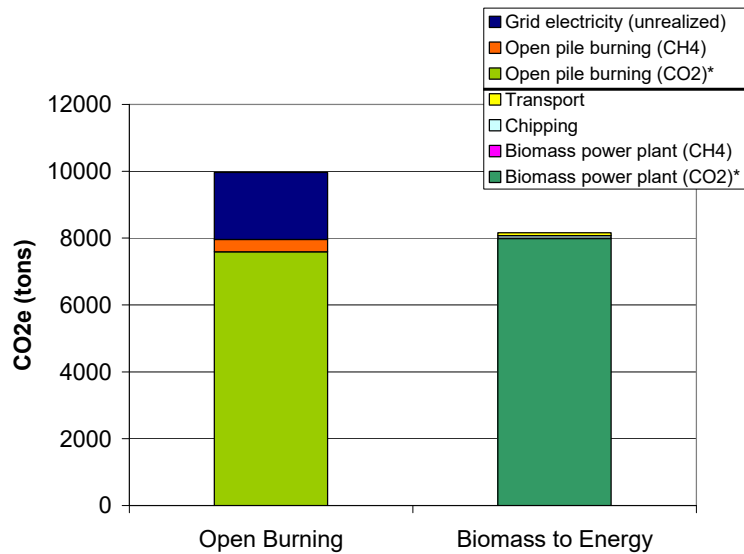




## Biomass to Electricity Reduces Criteria Air Pollutants



## Biomass to Electricity Reduces Greenhouse Gases





## Black Carbon

- 20% of PM
- Short lived climate pollutant with very high global warming potential
- Significant source from uncontrolled biomass burning -- prescribed burning (open pile and broadcast) and wildfire
- Developing GHG offset protocol for biomass energy as alternative to open pile burning
  - Conducting research program to quantify emissions from open pile burning of forest and ag materials in Placer County
    - Measurements being conducted by USFS Rocky Mountain Science Station Missoula Fire Sciences Laboratory



## The CPUC BioMat Program

- Incentivizes small distributed generation facility development with 10,15 or 20 year Power Purchase Agreement
- 3MW export. Up to 2 MW use on site
- Project must have site control, a completed, but not active, interconnection study and a project developer with experience on their team.
- Price will begin at 12.7 cents in category one - urban wood waste, 18.7 cents in agricultural wood waste and 19.9 cents within the forest biomass category.
- Forest derived wood waste must be source from unique definition "sustainable forest management" defined for this program.
- Program will end January of 2021.



## Biochar: Sequestration of Carbon

- Carbon-rich, charcoal-like solid from thermal gasification/pyrolysis
- Use as soil amendment:
  - Sequesters carbon -- highly stable and resistant to decomposition
  - Enhances soil fertility -- increases water and nutrient holding capacity
  - Reduces soil emissions, enhances biomass growth
  - Displaces fertilizer manufacturing
- OPR is looking at and has published very promising information about this product



## What can Cities Do?

- Educate constituency that healthy forests needs some trees to be cut down, that burning wood is unhealthy generally speaking, and that we are all responsible for the fate of wood waste
- Consider small government owned scale bioenergy facilities
- Consider amending codes to facilitate private development of bioenergy General Plan
  - Zoning
  - Building Code
  - Incentives
- Innovative wood products markets like biochar or other niche wood markets
- Continue to encourage our State leadership to fund these activities