



Air Quality Issues and Opportunities - Placer County Forest Resource Sustainability Initiatives

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Placer County Air Pollution Control District**

Community-Scale Bioenergy Conference

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Topical Outline/Discussion Points

- Why Placer County and the Air District are interested in Forests & Fires
- What initiatives and projects we are supporting regarding forest fuels reduction and wildfire mitigation
- Describe the results of some of those efforts to date

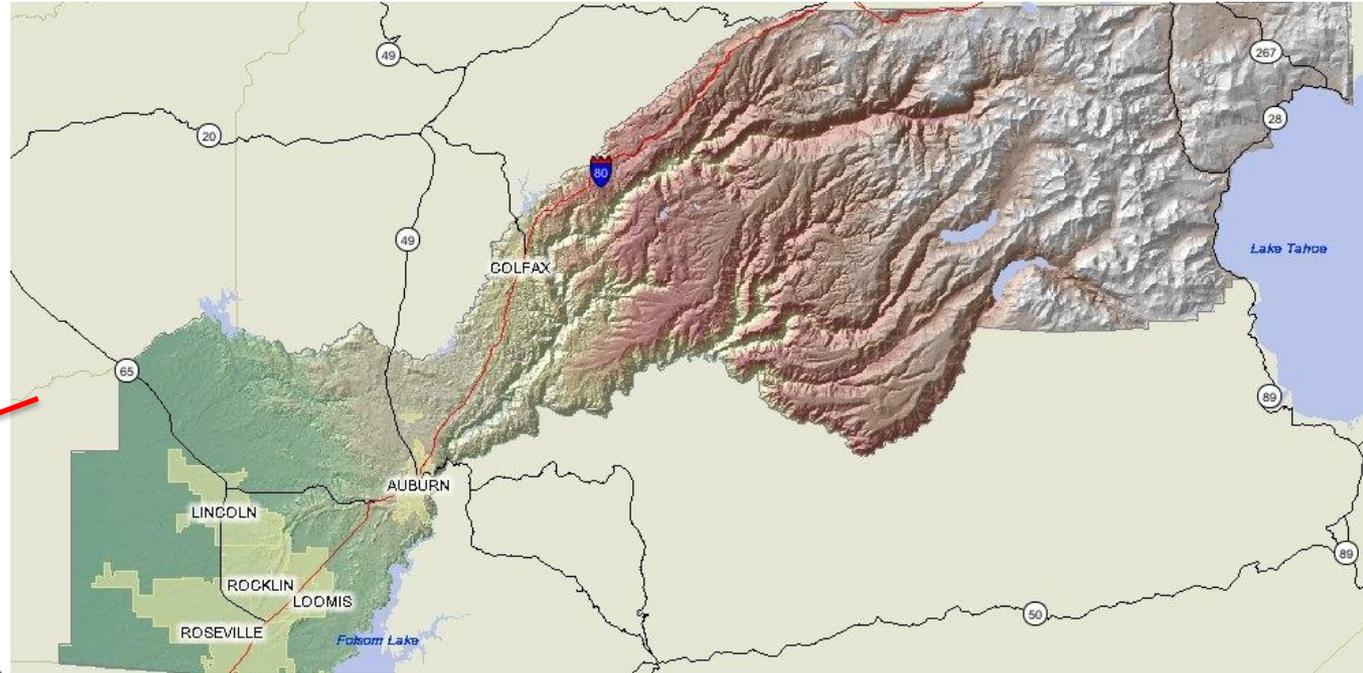


Placer County Landscape

- Sacramento Valley to Lake Tahoe
- 550,000 acres of forested land (> 50% of total county land, including three National Forests)
- Numerous wildland-urban interfaces throughout the County
- Heavy fuel loads throughout forested landscape from decades of fire suppression
- History of major wildfires in local area National Forests over the past decade
 - Gap, Ponderosa, Star, Ralston, American River Complex, Angora, Robbers – over 60,000 acres burned (+/- 10% of the forested landscape)
- Land managers are making concerted effort for forest fuel hazard reduction thinning
 - By-product – excess biomass waste



Placer County





Tahoe Forest Thinning

Massive South Shore fuels reduction project approved

January 13, 2012, Tahoe Daily Tribune

SOUTH LAKE TAHOE, Calif. — The U.S. Forest Service Lake Tahoe Basin Management Unit has approved a more than 10,000 acre project to reduce wildfire risk to communities at Lake Tahoe's South Shore and restore the health of the area's forests, according to a Friday statement.

The South Shore Fuel Reduction and Healthy Forest Restoration Project will thin trees and brush on national forest system land from Cascade Lake to the Nevada stateline. The project will take approximately eight years.

The project is designed to provide defensible space, reduce the risk of high intensity fire and create forests better able to resist drought, insects and disease, while restoring stream environment zones, meadows and aspen stands, according to the statement.

Thinning by crews with chain saws, removing trees using tracked and rubber-tired equipment and prescribed fire are included in the project.

The Forest Service plans to move forward with hand thinning as soon as conditions allow. Mechanical thinning will undergo permitting through the Lahontan Regional Water Quality Control Board before starting.

“The fuel reduction efforts outlined in the South Shore project are critical to protecting our communities from wildfire,” said LTBMU Forest Supervisor Nancy Gibson in the statement. “We will continue to work closely with the Lahontan Regional Water Quality Control Board, and our goal is to begin implementing the project this summer.”



Forest Resource Sustainability Initiatives

- PCAPCD Approach to Wildfire Mitigation

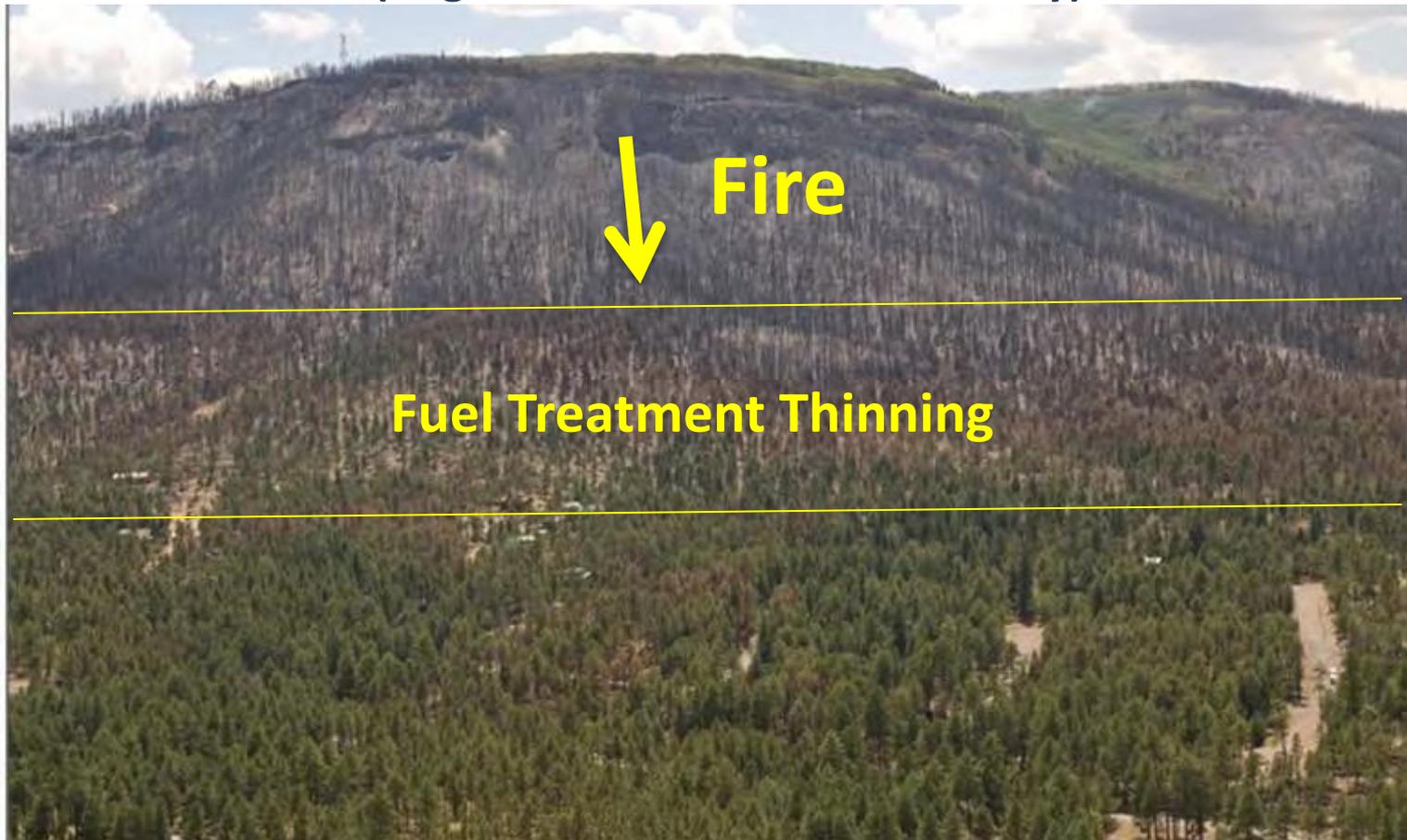
Explore and implement market based initiatives to reduce the costs of fuel hazard reduction activities at a strategic pace and scale that will mitigate the severity and impact of catastrophic wildfire events

- 1) Bio-Energy Conversion -- Utilize excess forest biomass for production of renewable energy in lieu of open burning
 - a) Confirm project level economics and air emissions reduction
 - b) Research wildfire behavior mitigation and impacts from fuel load reductions
- 2) GHG Offset Protocols for bio-energy and fuel treatment(s) activities
- 3) Small scale distributed generation bio-energy facility development
- 4) State Agency Engagement Monetize benefits of wildfire mitigations & assist in implementation of State 2012 Bio-Energy Action Plan policies
 - a) Engagement (PCAPCD has party status) in Public Utilities Commission rulemaking proceedings related to renewable energy, interconnections, distributed generation, and pricing



Positive Effects of Fuel Treatments

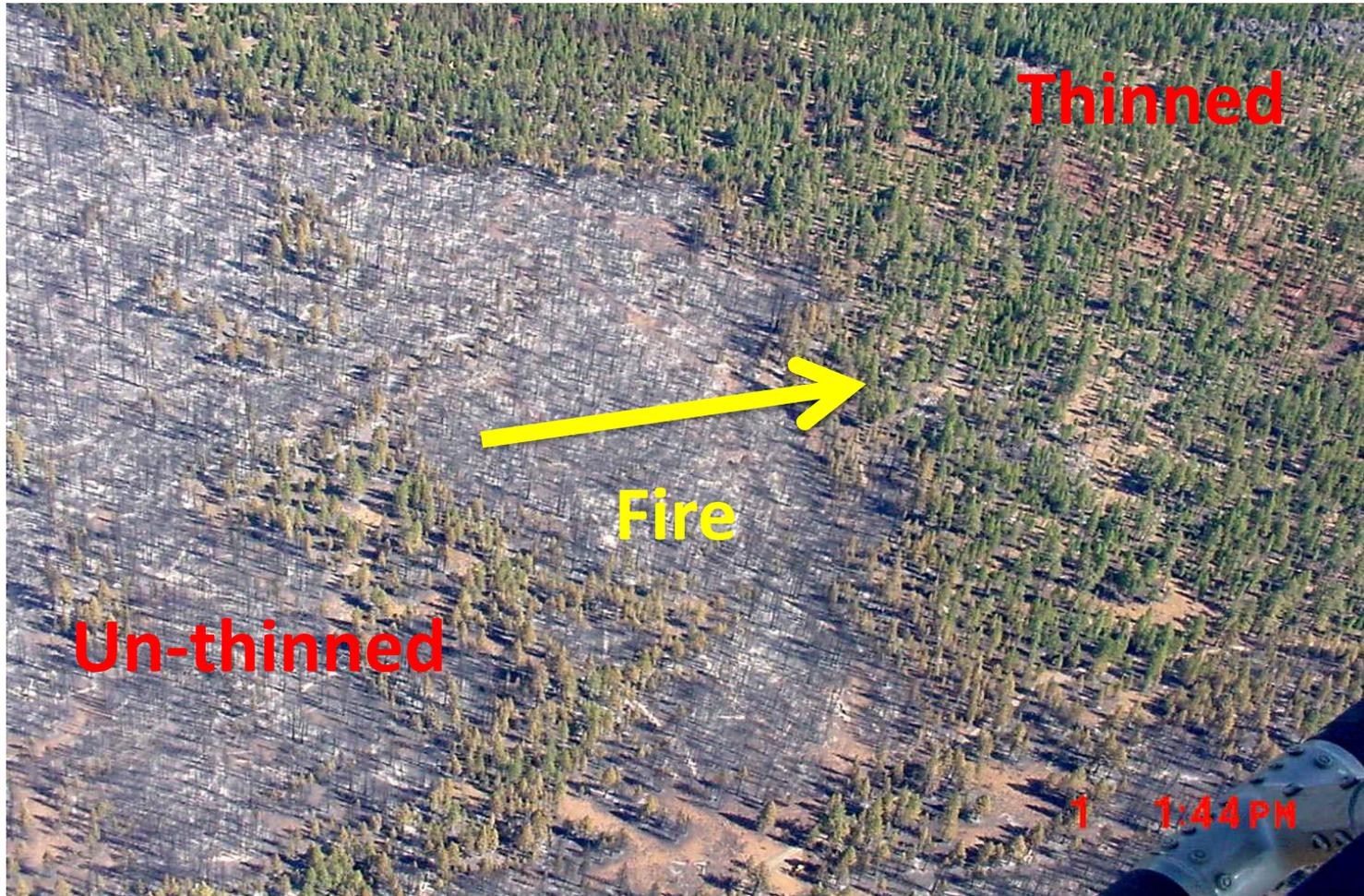
Wallow Wildfire, Apache National Forest, Arizona, May 2011, 500,000 acres
(largest wildfire in Arizona history)





Positive Effects of Fuel Treatments

Cone Wildfire, Lassen National Forest, Sept 2002





Woody Biomass Wastes





Open Burning vs Renewable Energy

Open Pile Burn



Cost to chip and transport biomass to bioenergy facility

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Price paid by bioenergy facility for biomass fuel

VS

Renewable Biomass Energy



Grind and Haul Biomass



30 MW Co-Gen

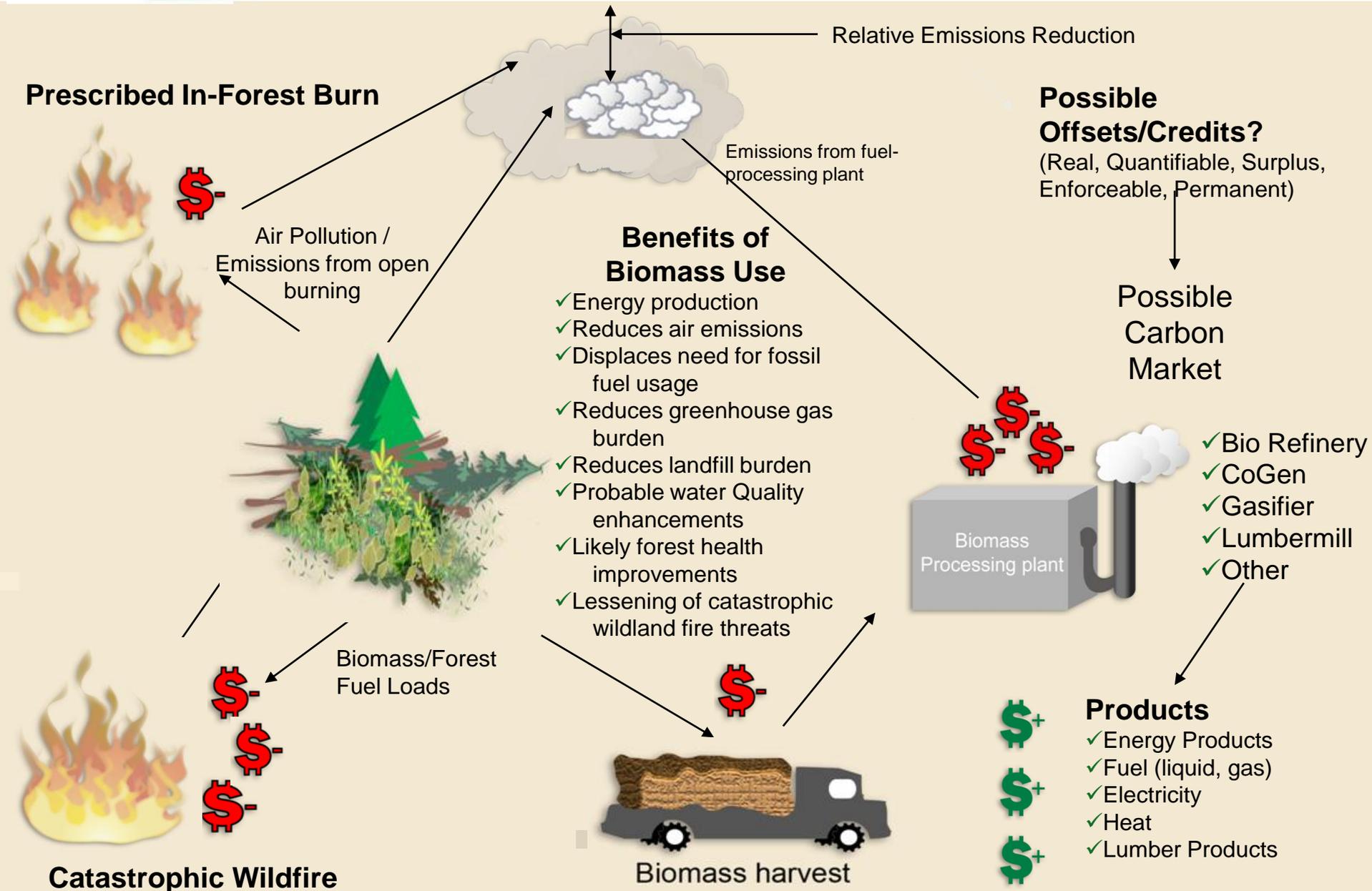
Controlled Energy Generation



0.5 MW Dist Gen



Biomass Emission / Economic Process Model

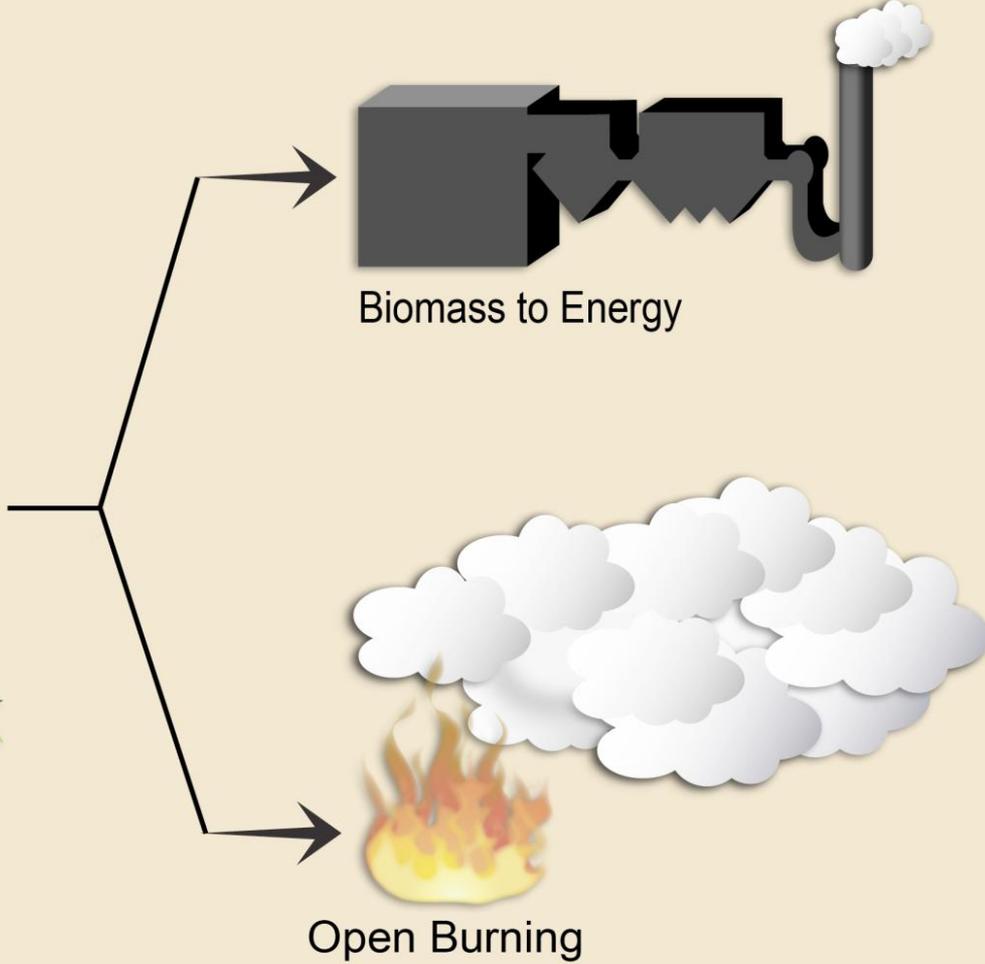




Air Pollution Comparison

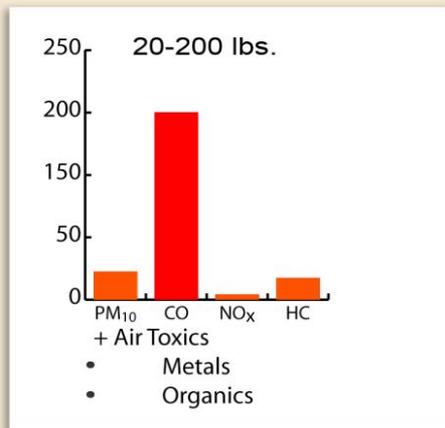
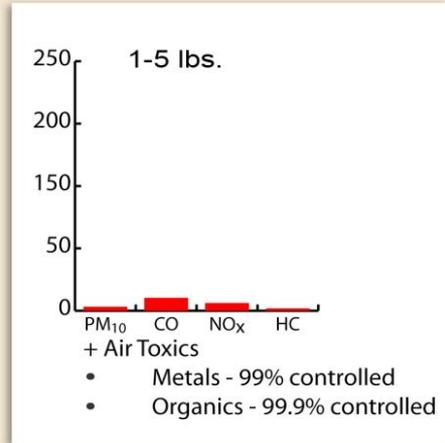


1 Ton of Biomass



Biomass to Energy

Open Burning

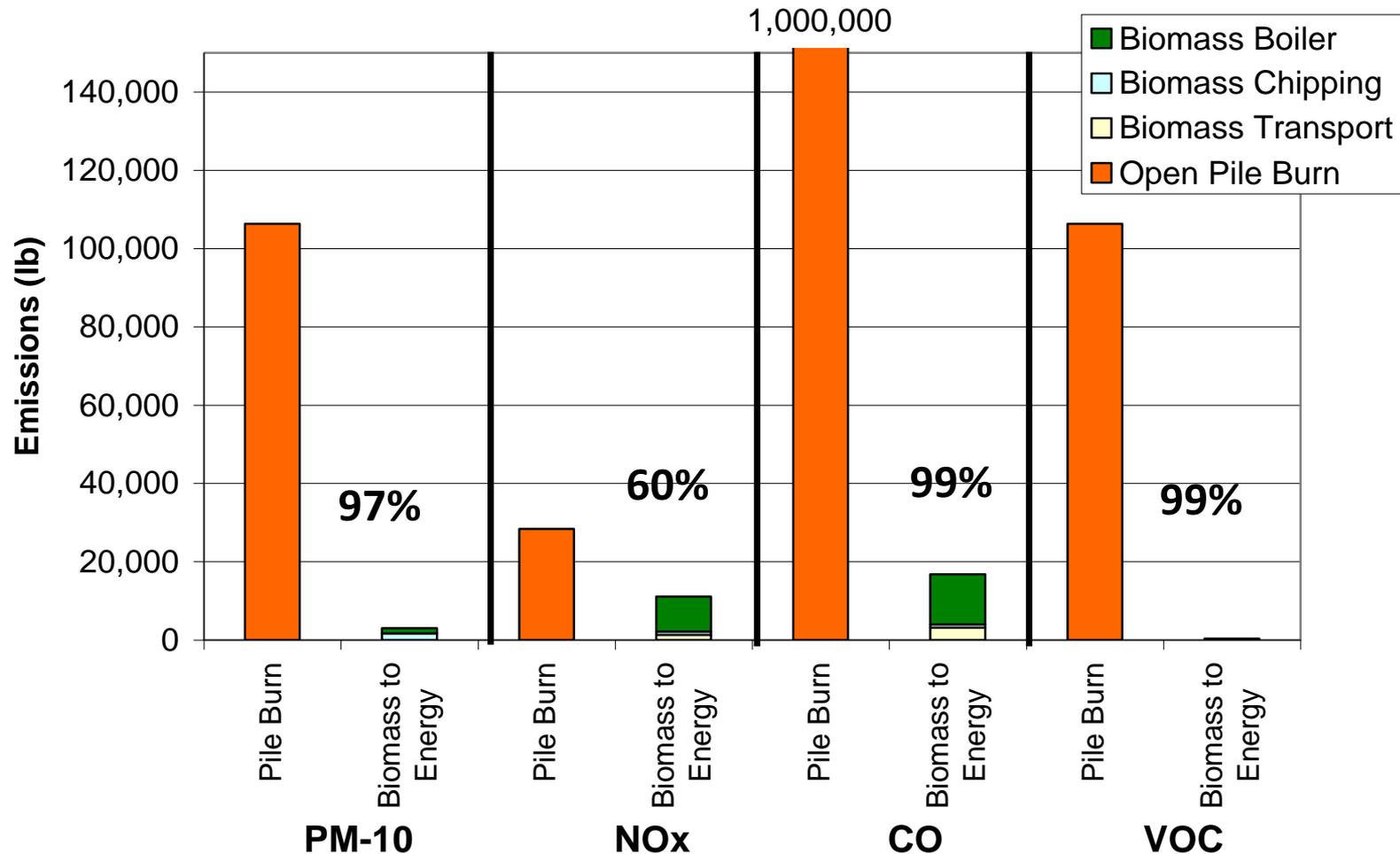




Bio-energy Conversion Initiative

Criteria Air Pollutants

Results from biomass energy project that processed 6,800 BDT biomass from thinning project on USFS Tahoe National Forest American River District

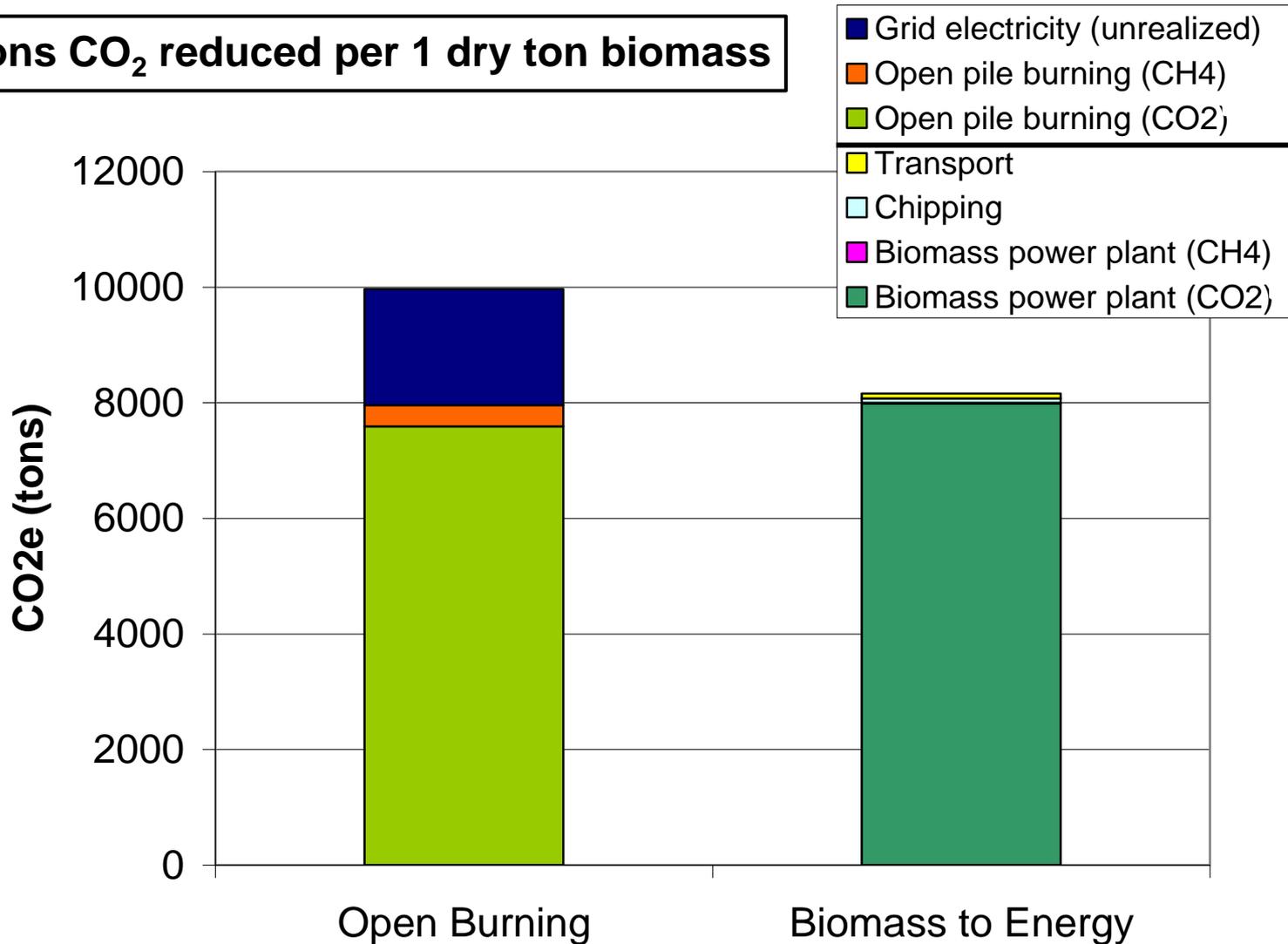




Bio-energy Conversion Initiative

Greenhouse Gases

0.4 tons CO₂ reduced per 1 dry ton biomass



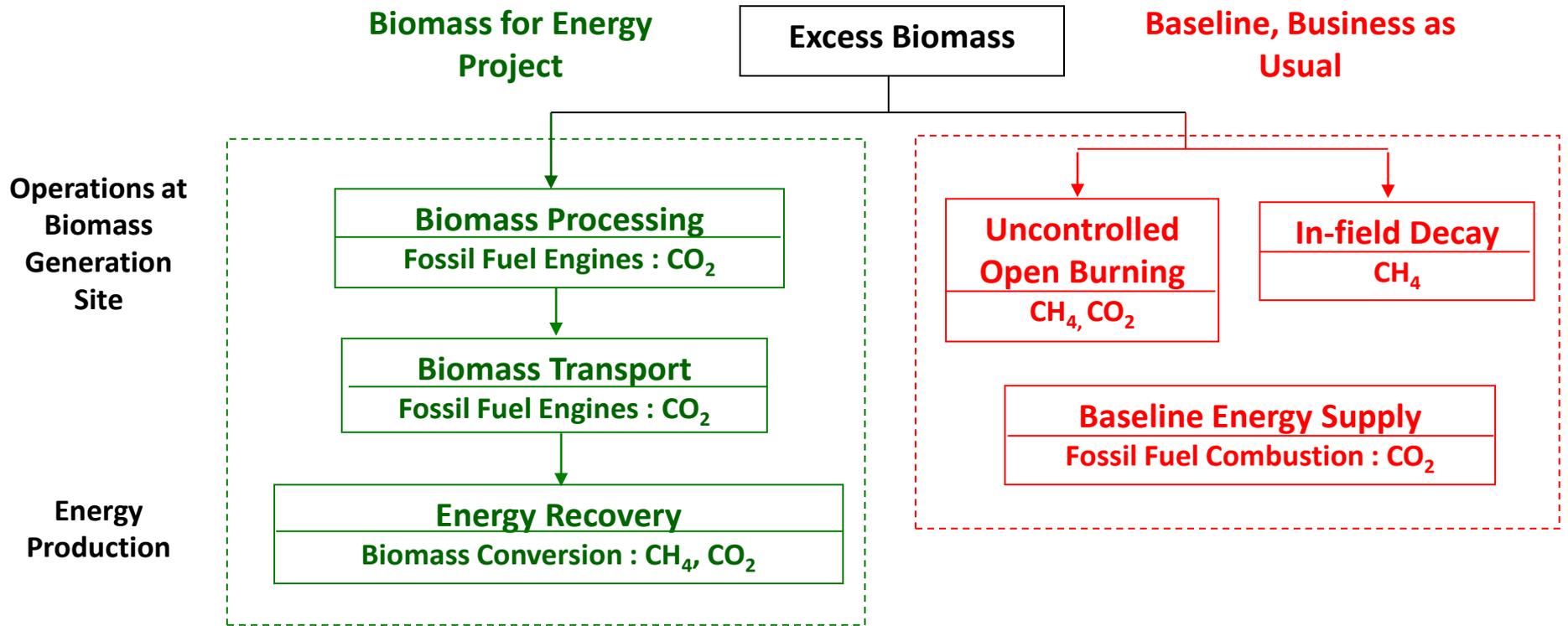


Biomass Waste for Energy Project Greenhouse Gas Offset Protocol Initiative

- Utilize excess biomass wastes for production of renewable energy as alternative to baseline business as usual (open burning)
 - Monetary support for biomass processing and transport to energy facility
- Greenhouse gas benefits result from:
 - Avoided methane from open pile burning
 - Renewable biomass energy displaces fossil fuels
- Endorsed by:
 - California Board of Forestry, USFS, and Cal Fire
 - California Air Districts, including San Joaquin, South Coast, Mendocino, Butte, Feather River, and the California Air Pollution Control Officers Association (CAPCOA)
 - American Carbon Registry interest in listing



Protocol Accounting



$$\begin{aligned}
 \text{GHG}_{\text{Reduction}} &= \text{GHG}_{\text{Open Burn}} + \text{GHG}_{\text{Decay}} + \text{GHG}_{\text{Baseline Energy}} \\
 &\quad - \text{GHG}_{\text{Biomass Energy}} - \text{GHG}_{\text{Biomass Processing}} - \text{GHG}_{\text{Biomass Transport}}
 \end{aligned}$$



Spring 2013 Bio-energy Project

- Partnering with UC Berkeley Blodgett Forest Research Station, College of Natural Resources
 - 5,000 acres of mixed conifer forest in Sierra Nevada
- 1,300 BDT (approximately 90 truck loads) of forest slash from timber operations scheduled for open burning...will create 1,300 MWhrs electricity to power 225 homes for one year
- PCAPCD to fund processing and transportation of forest biomass using GHG protocol
- GHG credits created and sold at cost (to recoup initial funding)







Bio-energy Facility Development Initiative

Tahoe Region Biomass Project

- 2 MW electricity (gasification and internal combustion engine)
- 16,000 BDT/yr woody biomass from local forest management
- Draft EIR released for comment in Aug 2012, Final EIR December 2012
- US Dept of Energy/Placer County/Private Investment funding





Biomass Energy Benefits

- Net improvement in air quality – reduction in criteria air pollutants, toxics, and black carbon
- Greenhouse gas reduction -- displacing fossil fuel
- Baseload, 24/7 renewable energy
- Supports hazardous fuels reduction and healthy forests
 - Watershed – water quality, quantity, timing
 - Wildfire – reduces size and intensity
 - Ecosystem services – recreation, habitat protection
 - Electrical Transmission Infrastructure Protection
- Provides employment (4.9 jobs/MW)
- Reduces waste material destined for landfills



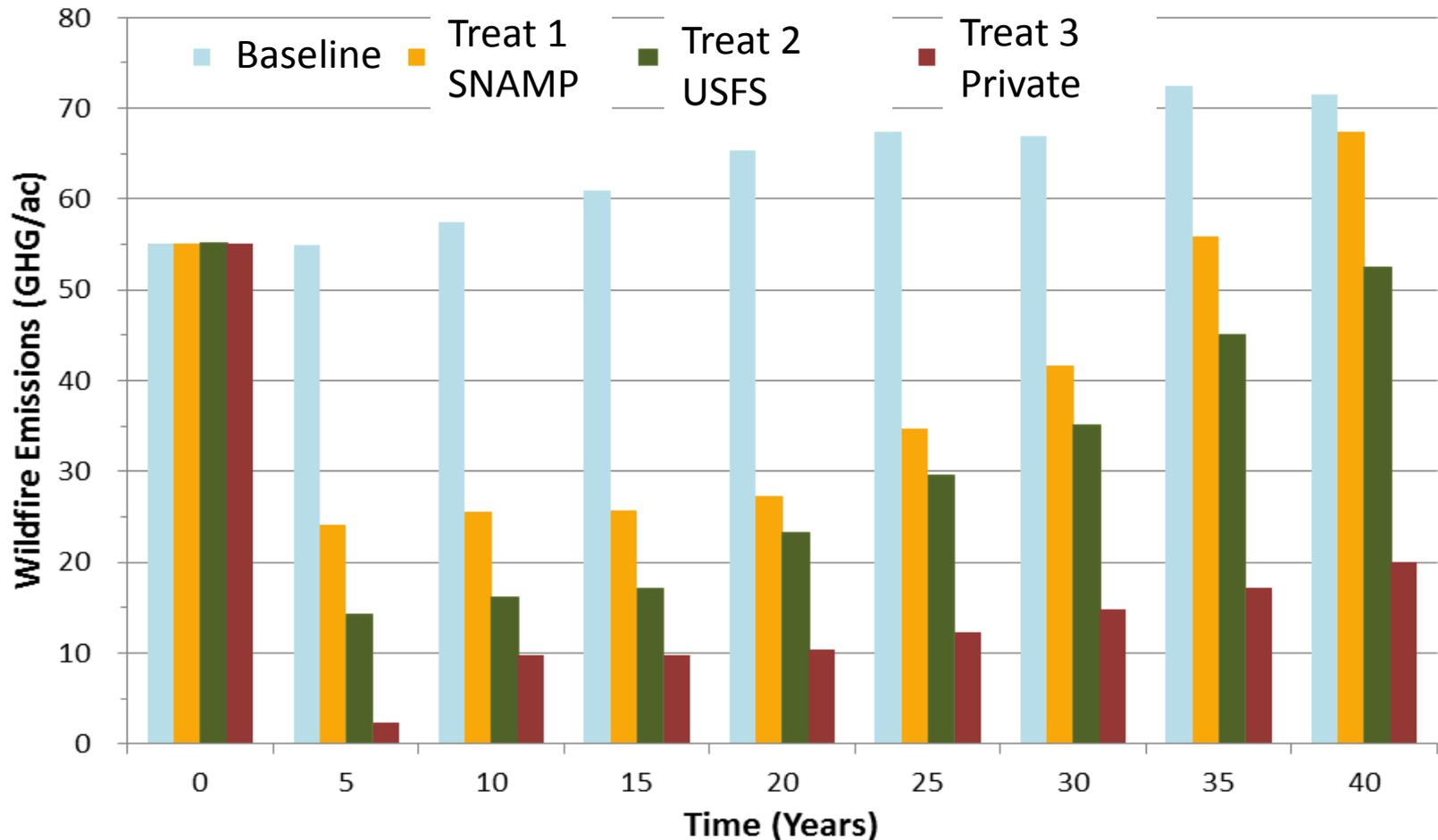
Research—Carbon Benefit of Forest Management

- Quantify GHG and criteria emission reductions accruing from forest management projects--field measurements coupled with fire, weather, and growth models
 - Wildfire reduction – size, intensity, behavior
 - Forest growth rate enhancement
- Research Team
 - U.S. Forest Service Pacific Southwest Research Station, U.C. Berkeley, and Spatial Informatics Group
- Project
 - Sierra Nevada Adaptive Management project site, east of Auburn
 - Three thinning treatment intensity levels



Preliminary Results

- GHG emissions from wildfire for baseline (no treatment) compared with 3 treatment prescriptions
- Particulate matter emissions are proportional to GHG; both related to quantity of forest biomass that burns





Preliminary Summary of Fuel Treatment GHG Impacts

- Fuel treatments remove carbon from the forest – sequestered into wood products and/or provide energy to displace fossil fuels – which otherwise will eventually be released in wildfire or through decomposition.
- Forest carbon lost from most fuel treatments regrows in 7 – 15 years.
- Carbon lost in wildfire is reduced on treated land, as well as adjacent untreated land due to wildfire shadow effect.
- Without fuel treatment, tree mortality from wildfire can be very high, and in the long term, dead trees decompose. With fuel treatments, tree mortality is lower and favors survival of large-diameter, fire-resistant, trees, which provide long-term, stable carbon storage.
- In landscapes with a short fire return interval (which include most of the Sierra Nevada), fuel treatments can provide significant carbon benefits.



State Agencies Engagement Initiative

Using California Public Utility Commission (CPUC) policy and pricing mechanisms, legislative tools, and Energy Commission (CEC) programs to facilitate forest biomass conversion to bio-energy.

- Engage in Feed-in Tariff rulemaking at CPUC related to projects <3 MW to provide administrative framework for successful implementation of small scale DG bio-energy facilities including a fair contract template between utilities and power producers, and a fair regulatory framework for interconnection.
- Facilitate implementation of recently passed SB 1122 (Senator Rubio) that required utilities to purchase 250MW of bio-energy commencing in June 2013 and continue to advocate the policy benefits of bio-energy with legislators.
- Continue to support the CEC in the implementation of the State's Bio-energy Action Plan and distribution of Electric Program Investment Charge (EPIC) funds in a way that supports forest bio-energy.



Placer County Air Pollution Control District Award

- U.S. Environmental Protection Agency Recognizes Outstanding and Innovative Efforts to Achieve Cleaner Air
 - 2011 Clean Air Excellence Award for



Forest Resource Sustainability in Placer County

We have processed and transported 15,000 BDT's of waste to biomass energy facilities which has fueled the generation of 15,000 MW hours of renewable electricity, enough to power more than 1,500 homes for one year.

This Project was chosen *“for its impact, innovation and replicability”*

