



Forest Resource Sustainability Initiatives in Placer County

*Forest Biomass Diversion Alternatives from
Business as Usual Practices*

**Tom Christofk, Air Pollution Control Officer
Placer County Air Pollution Control District**

UC Berkeley Blodgett Research Forest Station Field Trip

August 21, 2013



Topical Outline/Discussion Points

- Background of why Placer County and the Air District are interested in Forests & Fires
- What initiatives and projects we are supporting regarding forest fuels reduction, wildfire mitigation, and GHG emission reduction opportunities
- 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
 - ~40% in private ownership, 60% public
- Extensive wildland-urban interface throughout the County
- Heavy fuel loads throughout forested landscape from decades of successful fire suppression
- History of major wildfires in local forested areas over the past decade
 - Gap, Ponderosa, Star, Ralston, American River Complex, Angora, Robbers, American – 75,000+ acres burned to date (14% of the forested landscape)
- Wildfires have very significant impact on regional air quality
- Land managers are making concerted efforts to ramp up forest fuel hazard reduction thinning activities
 - By-product – excess biomass waste
- Very similar situation throughout most of the Sierra Nevada's



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.”



Typical National Forest Management

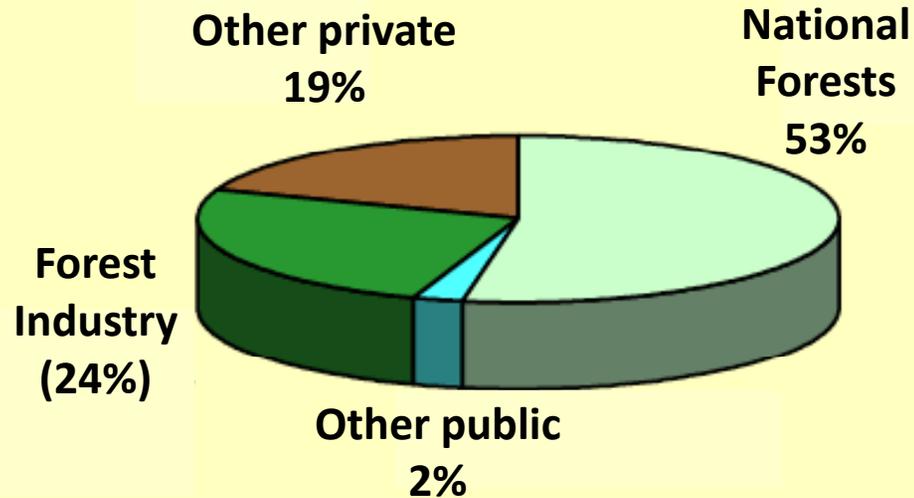


- Thinning/partial cutting
- Remove commercial-sized trees
- Dispose of excess biomass--burn piles in forest or at landing, or broadcast burn
- Utilize biomass only if there is sufficient market



Targeted Fuels Treatment in California

California's Timberland (18 million acres)



Does not include:
 National parks
 State parks
 Wilderness areas
 Oak woodlands
 (+/- 20 million acres)

Source:
 USFS
 Calif. Forest Assoc.

Ownership	Timbered Acres	Targeted for Treatment (acres/year)
US Forest Service	9,784,000	200,000 – 500,000
Forest Industry	4,402,000	100,000 – 200,000
Non-Industrial Private	4,169,000	75,000 – 100,000
Totals	18,355,000	375,000 – 800,000



More Biomass in the News

March 29, 2013

THE UNION

March 29, 2013 FOUNDED IN 1864 TO PRESERVE THE UNION ... ONE AND INSEPARABLE WWW.THEUNION.COM

WEATHER MAN



H: 70°
L: 46°

See full forecast, Page A7

Partly cloudy

NEWS BRIEFS

Coming up

Check out Saturday's edition of The Union for a special report on the Hospitality House, Nevada County's largest homeless service organization, as it plans to open the area's first permanent shelter. The series will feature a look at the shelter, its programs, its supporters and more. Then head to TheUnion.com for additional content.

The Union's 2012 Best of Nevada County

Coming out Saturday, The Union will reveal the winners of the Best of Nevada County voting. Check in to see which local establishments were the top voters in a variety of categories.

Lead after truck driver wakes on Calif. highway

NS — A big rig driver choked on food and lost consciousness on a highway near Sacramento Thursday morning, leading to a crash that killed two people and injured three others, including the truck driver, authorities said.

BIOMASS



Photo by The Union for KATHY HART

CDF Travis Benson uses a Terra torch on North Boomfield Road near Derbee Road in Malakoff Diggins State Historic Park as part of the CDF's Vegetation Management Program and a co-op agreement with California State Parks. The practice of prescribed burning, which can be dangerous or have detrimental impacts to air quality, may be rendered obsolete if biomass plants were to be constructed in proximity to the national forest.

What will be the future of energy in the Sierra?

BY MATTHEW RENDA
Staff Writer

Momentum toward construction of a 2-megawatt biomass facility in western Nevada County was on full display at this week's Board of

creating energy with renewable resources, while creating jobs in a region that historically relied on resource extraction industries, such as timber.

"This really makes the case for the nexus between good forest management, fire safety and appropriate and valuable use

locations for a biomass, the amount of material available on a sustainable basis within a 30-mile radius of the potential plant, the ability to connect to the electrical grid, transportation and noise issues.

Katy Eckert, chief fiscal administrative officer with the Nevada County Health and Human Services Agency, confirmed

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BY LIZ KELLY
Staff Writer

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Forest Resource Sustainability Initiatives

PCAPCD Approach to Wildfire Mitigation

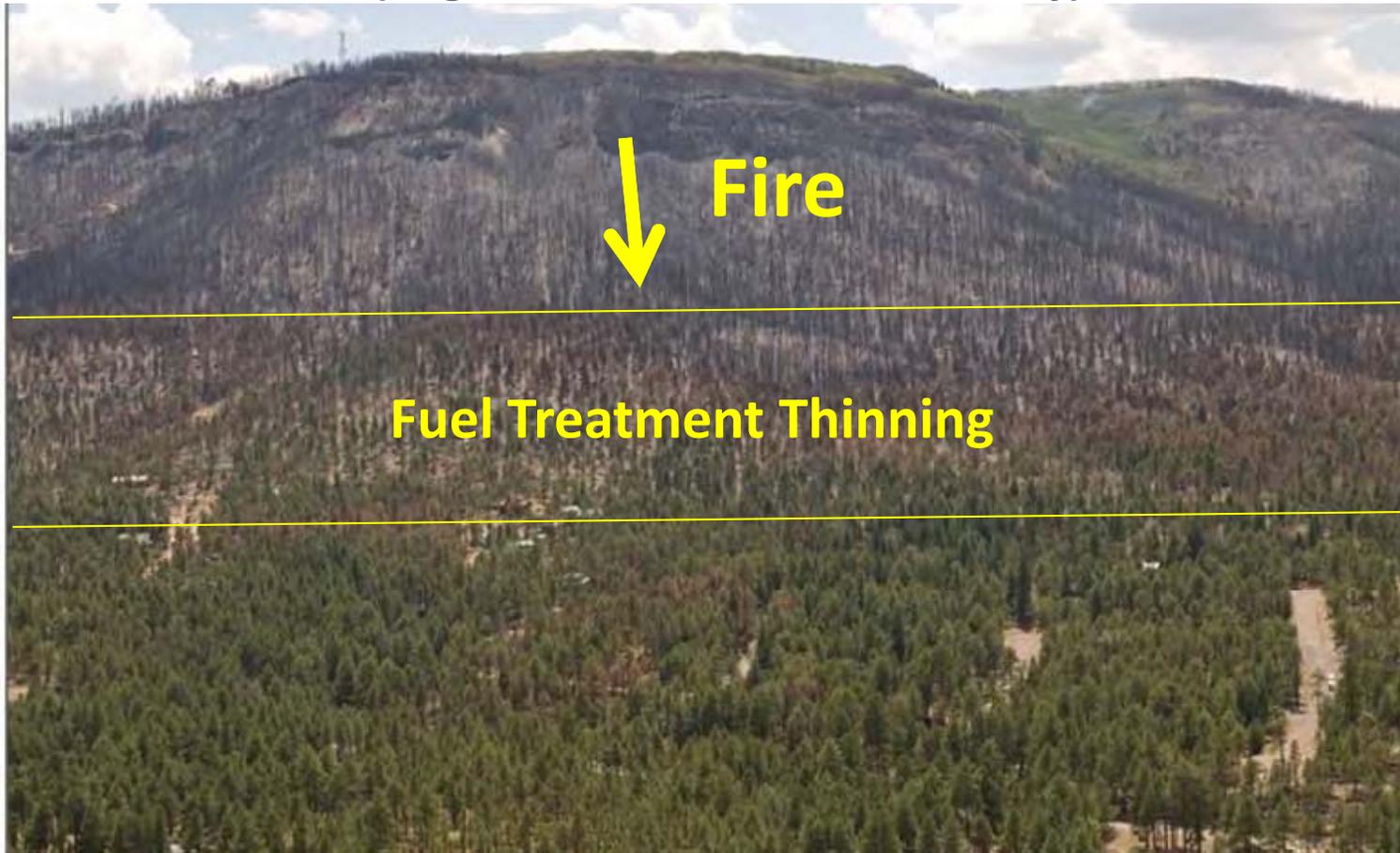
Explore and implement market based initiatives to reduce the costs of fuel hazard reduction activities at a strategic pace and scale that will mitigate the severity and impact of catastrophic wildfire events:

1. Bioenergy Conversion -- Utilize excess forest biomass for production of renewable energy in lieu of open burning
 - Confirm project level economics and net air emissions reductions
 - Blodgett Forest Research Station cooperative research project – UC Berkeley, UC Davis, Rocky Mtn Research Station (USFS), and PCAPCD
2. GHG Offset Protocols for bio-energy, biochar, and fuel treatment activities
3. Small scale distributed generation bio-energy facility technology and feasibility assessment
4. Research on how hazardous reduction treatments affect wildfire behavior and air pollutant emissions
5. State Agency Engagement
 - Monetize benefits of wildfire mitigations & assist in implementation of State 2012 Bio-Energy Action Plan policies
 - Engagement (PCAPCD has party status) in Public Utilities Commission rulemaking proceedings related to renewable energy, interconnection, distributed generation, and pricing



Positive Effects of Fuel Treatments

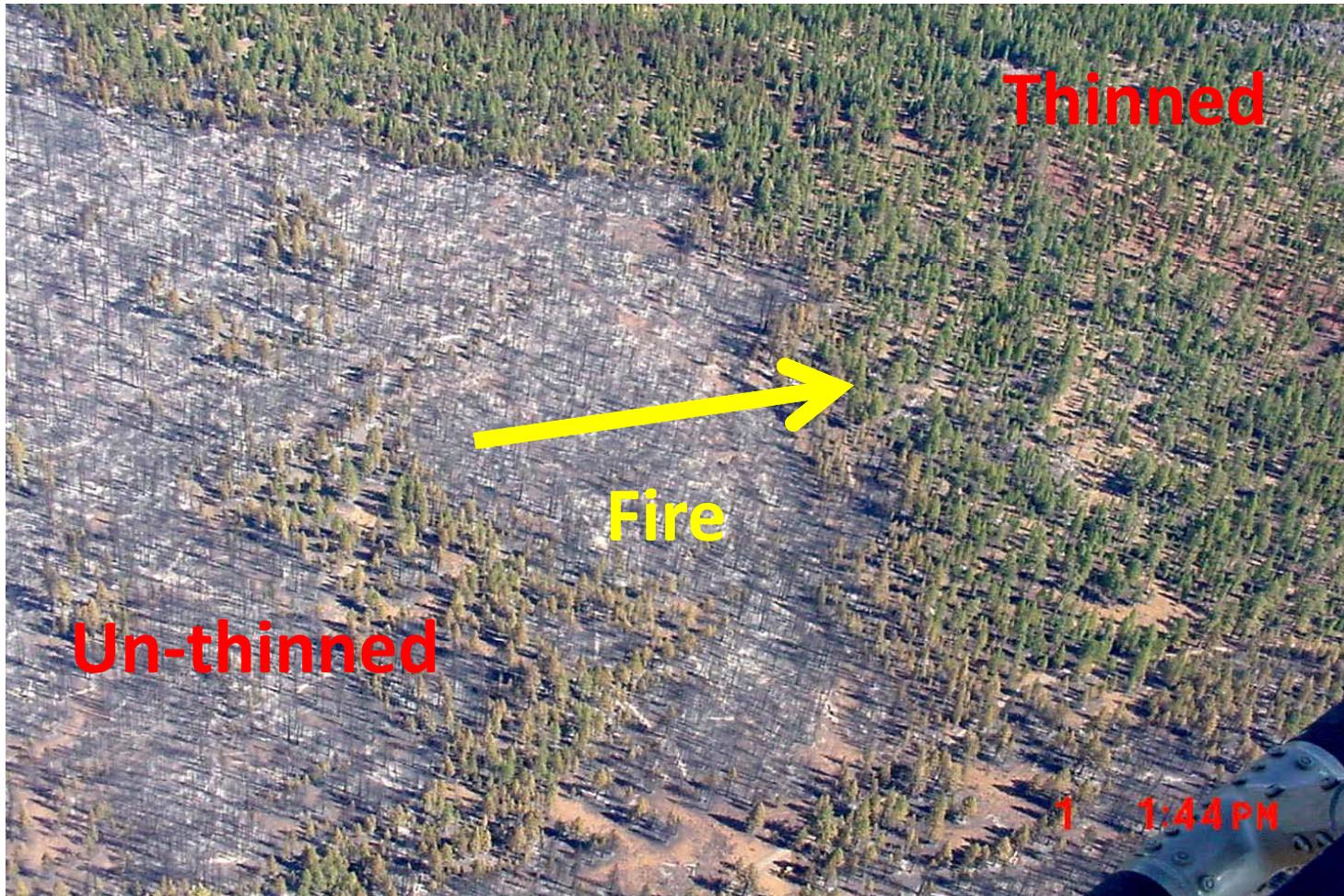
Wallow Wildfire, Apache National Forest, Arizona, May 2011, 500,000 acres
(largest wildfire in Arizona history)





Positive Effects of Fuel Treatments

Cone Wildfire, Lassen National Forest, Sept 2002





Fire Threat



Source: California Department of Forestry and Fire Protection, Fire and Resource Assessment Program (FRAP), prepared for the "National Fire Plan", V05_1, 2005.



Woody Biomass Wastes





Open Burning vs Renewable Energy

Open Pile Burn



Cost to chip and transport biomass to bioenergy facility > Value of biomass for fuel

VS

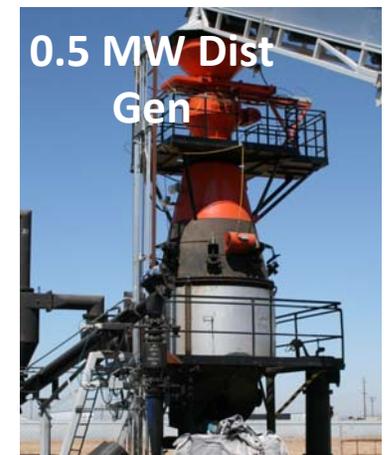
Renewable Biomass Energy



Grind and Haul Biomass

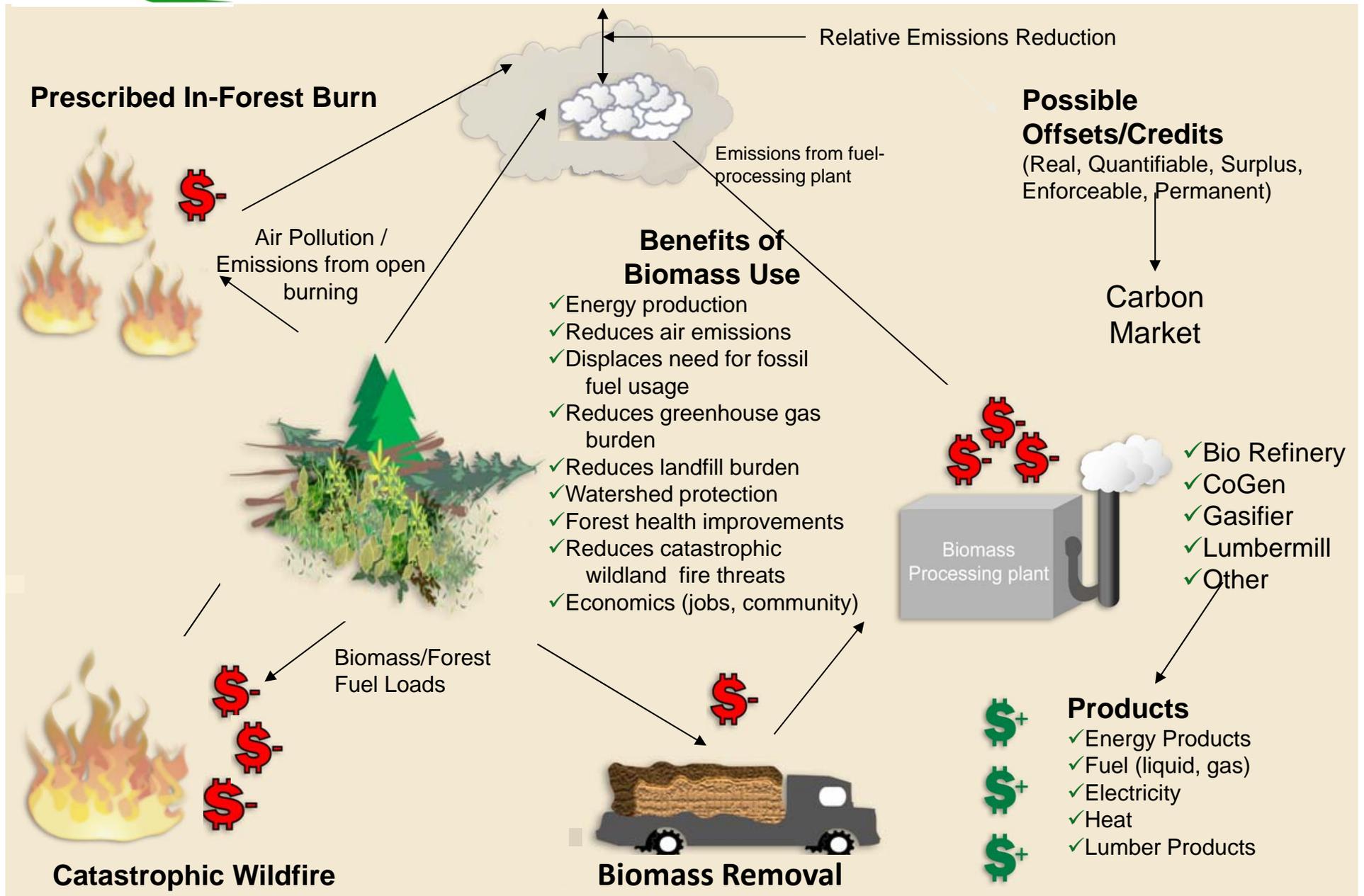


Controlled Energy Generation



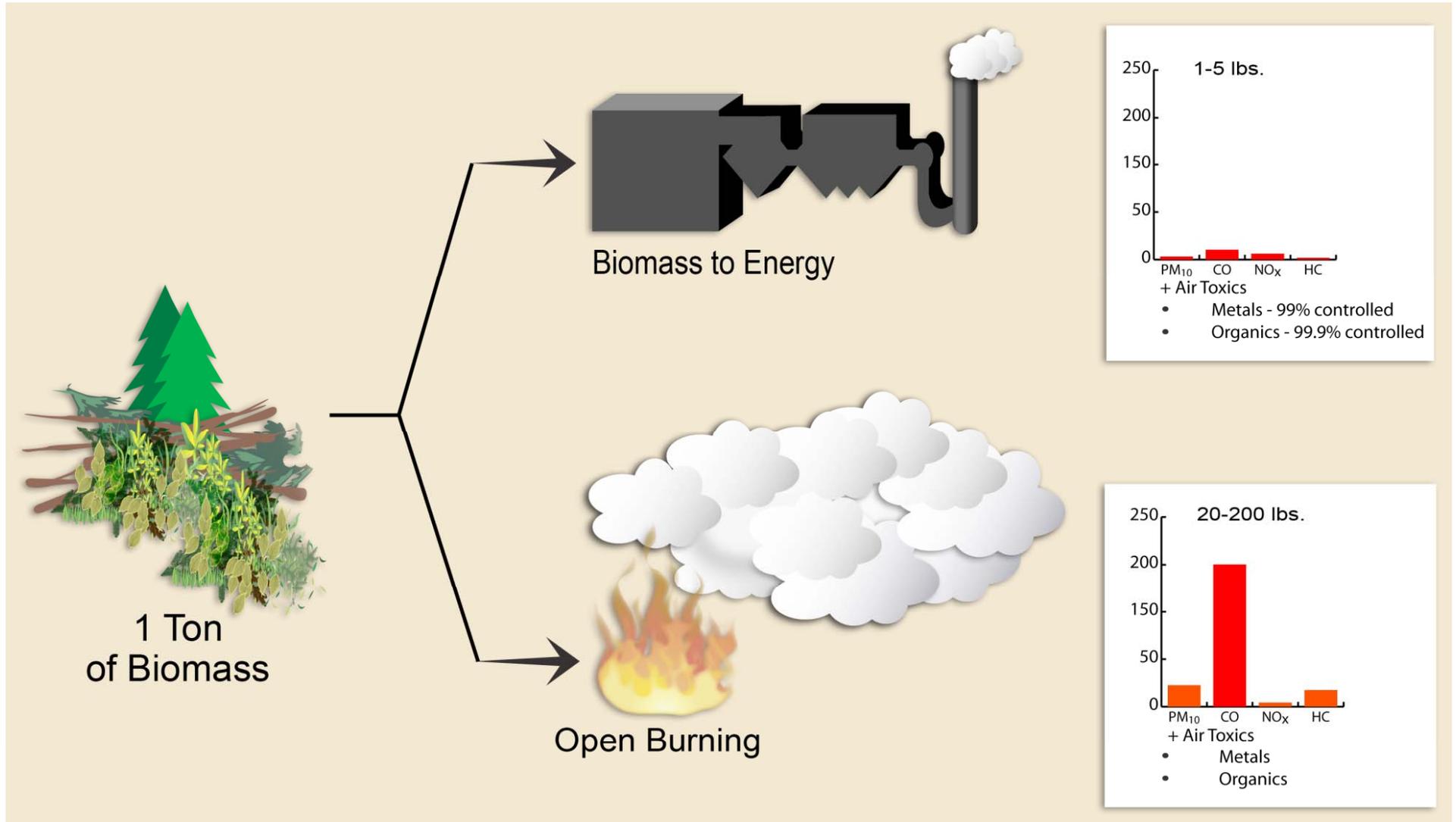


Biomass Emission / Economic Process Model





Air Pollution Comparison





Initiative 1. Biomass Conversion

Demonstration Project (circa 2006-2007)

Cornerstone of Forest Initiatives

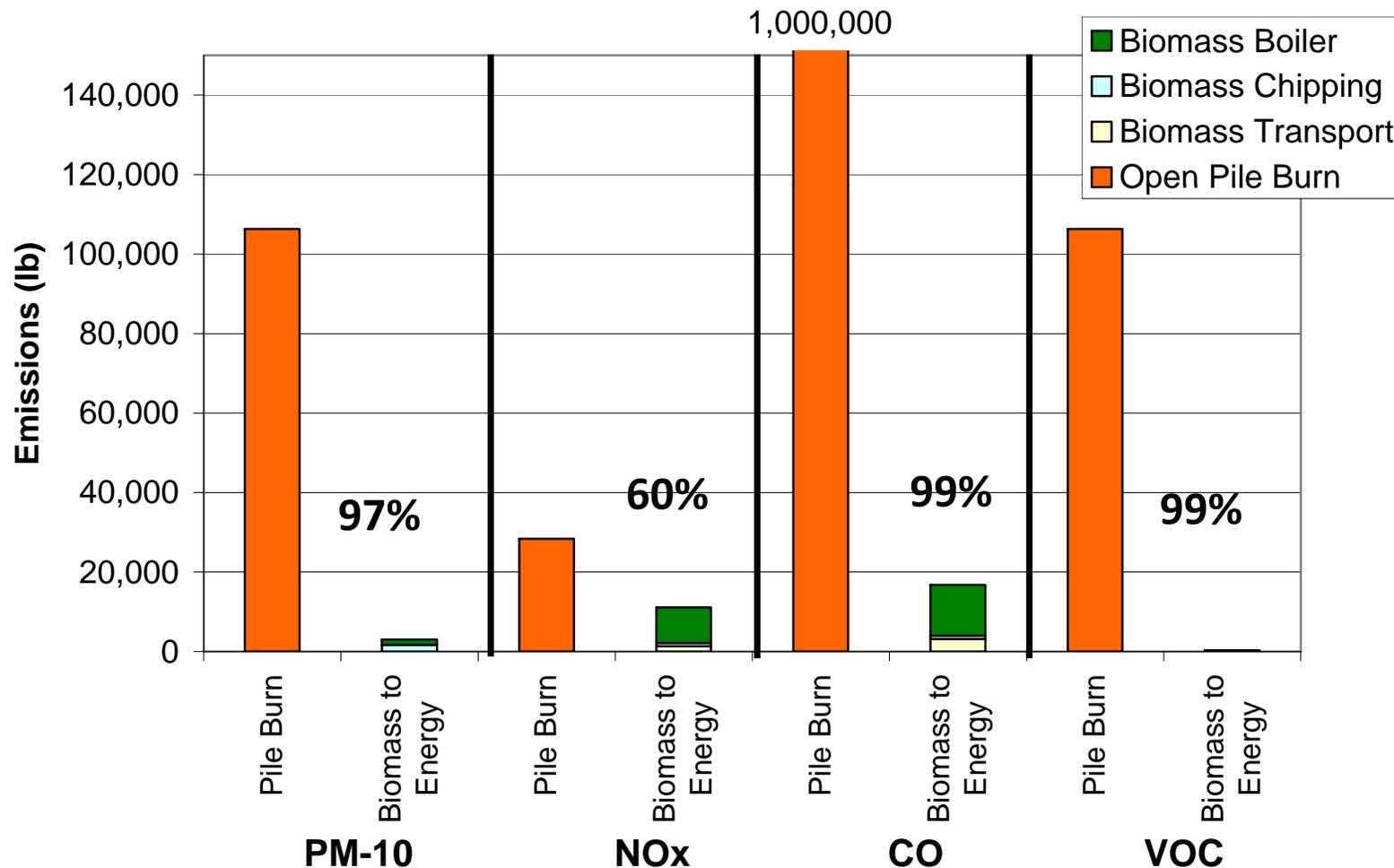




Bioenergy Conversion Initiative

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

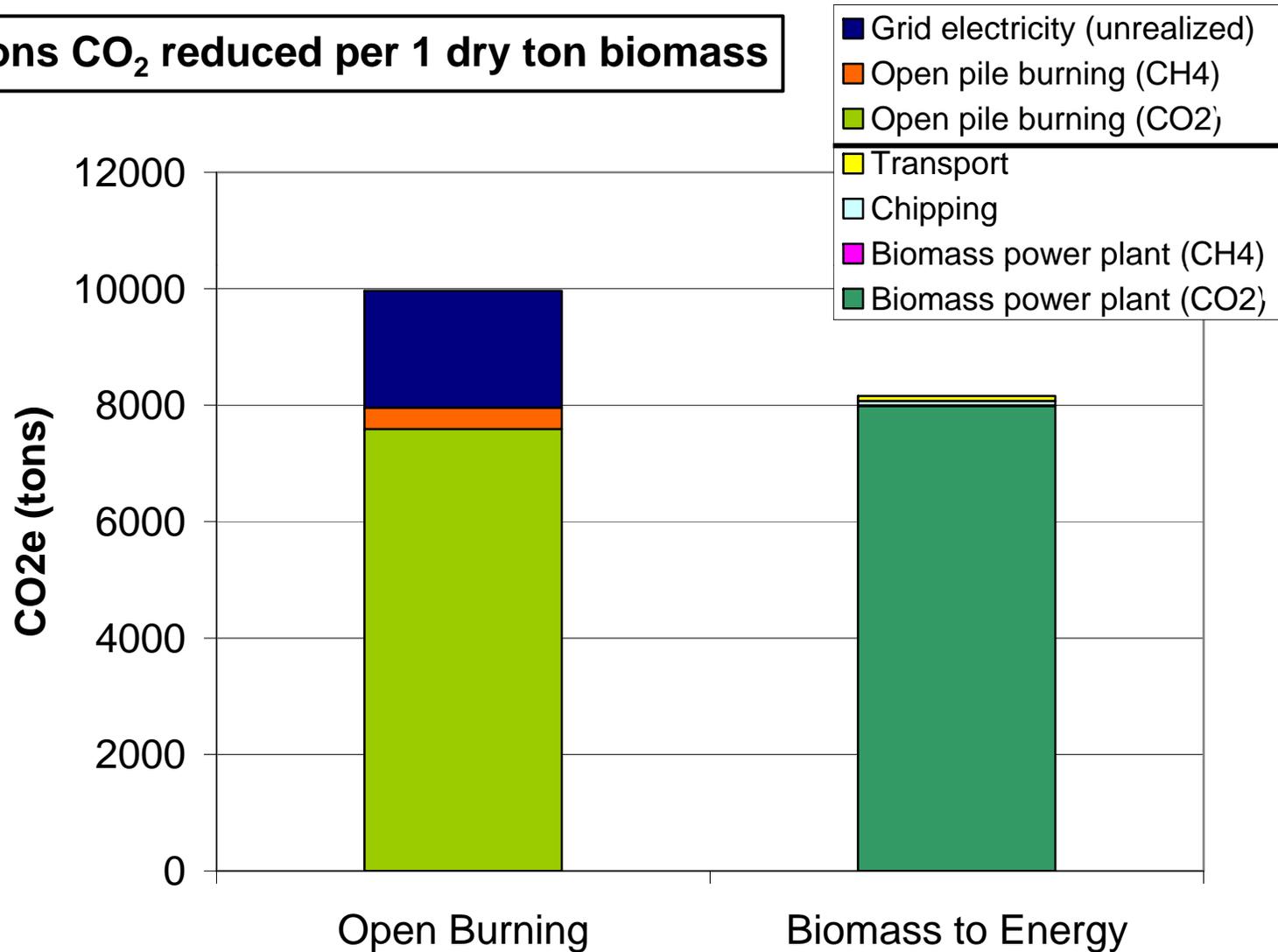




Bioenergy Conversion Initiative

Greenhouse Gases

0.4 tons CO₂ reduced per 1 dry ton biomass



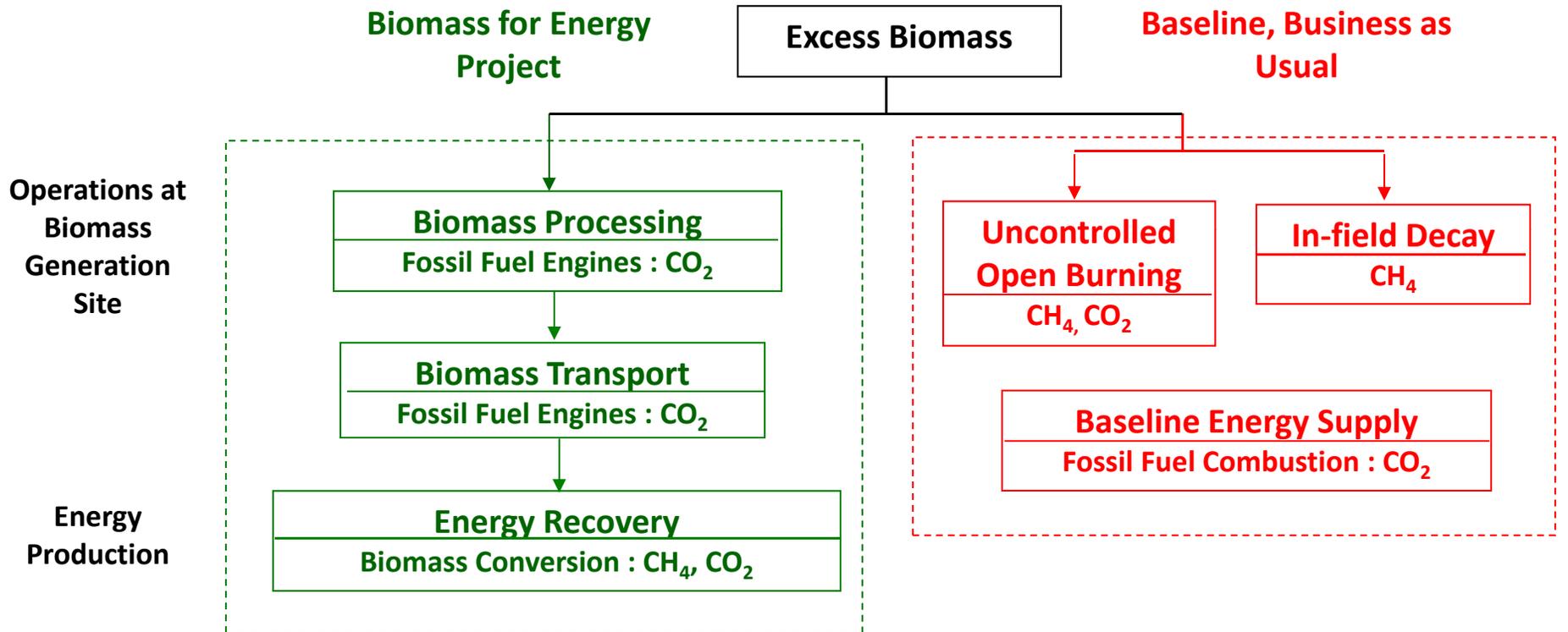


Initiative 2. Biomass Waste for Energy Project Greenhouse Gas Offset Protocol

- 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)
- Featured in new CAPCOA GHG Offset Exchange



Protocol Accounting



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



Blodgett Bioenergy Project

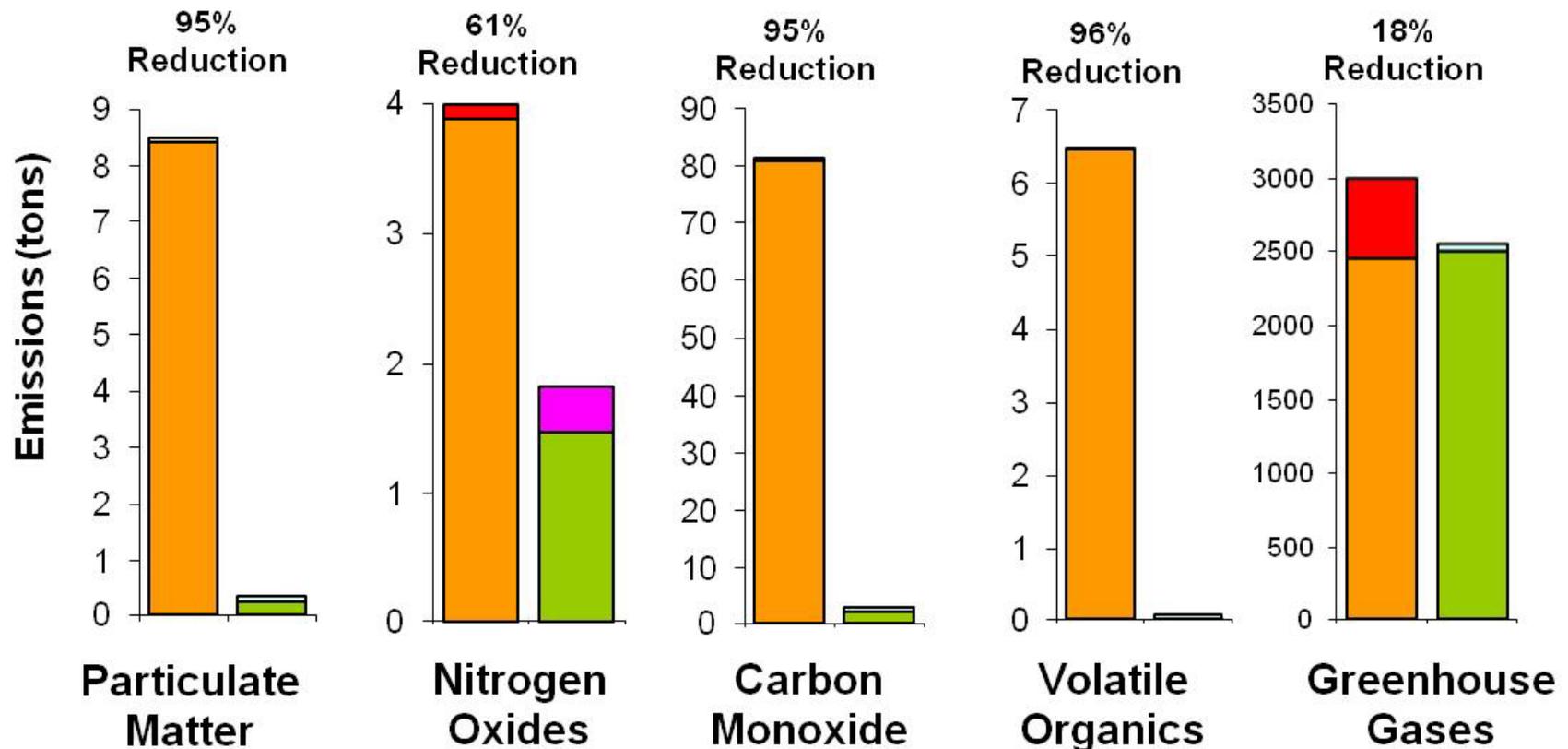
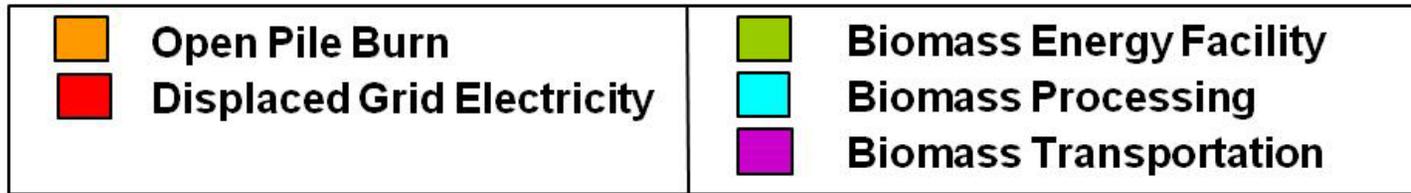
- UC Berkeley / PCAPCD project
- 1,300 BDT of slash from timber operations scheduled for open burning ... cost to chip/truck (\$65/BDT) > value to energy facility (\$45/BDT)
- PCAPCD to fund chip/truck of slash to Buena Vista Biomass Power Plant ... 1,300 MWh electricity (powers 225 homes for one year)
- GHG credits created using GHG protocol, sold at cost through CAPCOA GHG Exchange or District, and cash generated reinvested into local biomass projects
- USFS Rocky Mountain Research Station Fire Lab to make air pollutant measurements from a pile burn in November
- UC Davis Agricultural Engineering to evaluate project economics and energy use with state-of-the-art monitors





Blodgett Bioenergy Project

Anticipated Air Pollution Benefits





Initiative 3. Bioenergy Facility Assessment

Tahoe Region Biomass Project

- 2 MW electricity (gasification and internal combustion engine)
- 16,000 BDT/yr woody biomass from local forest management activities
- US Dept of Energy/Placer County/Private Investment funding
- Conditional Use Permit received June 2013
- Apply for Air District Permit -- Fall 2013
- LLC and Power Purchase Agreement currently being negotiated
- Final decision to build -- Fall 2013
- Construction -- 2014
- Integration and testing -- Spring 2015
- Online -- July 2015





Bioenergy 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 – water, carbon, wildlife habitat
 - Community and Infrastructure (including Electrical Transmission) Protection
- Provides employment (4.9 jobs/MW)
- Reduces waste material destined for landfills



Initiative 4. Forest Fuel Treatment Impact on Wildfires and Emissions

- 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
 - Biochar, black carbon, timber products, renewable energy
- 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



What We are Learning about the Carbon Benefits of Forest Management

- Forest management and fuel hazard reduction provides carbon benefits:
 - Wildfire mitigation -- Reduce wildfire size and severity, reduce tree mortality – both on treated land, as well as adjacent untreated land due to wildfire shadow effect
 - Wood products -- Sequestration and substitution for alternative, fossil fuel energy intensive, products of steel and concrete
 - Biochar – Byproduct of bioenergy production, provides stable long term sequestration as soil amendment
 - Renewable energy -- Displaces need for fossil fuels, reducing anthropogenic carbon emissions
- Hazardous reduction can produce significant carbon benefits – especially on landscapes with a short fire return interval (much of the Sierra Nevada).
- Most forest carbon removed during fuel treatments regrows in 7 – 15 years.
- Black carbon reductions from reduced wildfire and open pile burning have potential to provide near term climate change benefits.

Based on work by Dr. Malcolm North, USFS and UC Davis, and Spatial Informatics Group



Initiative 5. State Agencies Engagement Initiative

Using Public Utility Commission policy and pricing mechanisms, legislative tools, and Energy Commission programs to facilitate forest biomass conversion to bioenergy.

- Engage in Bioenergy Feed-in Tariff rulemaking, and other proceedings, at CPUC related to SB 1122 (passed in 2012) that required utilities to purchase 250MW of bioenergy, 50 MW of which must be from forest biomass to energy facilities. The District is working with the CPUC to develop fair prices for electricity, helping develop a reasonable contract template between utilities and power producers, and assisting with the development of a workable regulatory framework for interconnection.
- 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.
- Continue to advocate the policy benefits of bio-energy with legislators and state and federal agency administrators.
- Advocate for use of some Cap & Trade revenue toward forest management and biomass



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 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”*

