

# GHG Mitigation from Biomass Waste for Energy Projects



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

**11<sup>TH</sup> ANNUAL NEW PARTNERS FOR  
SMART GROWTH**

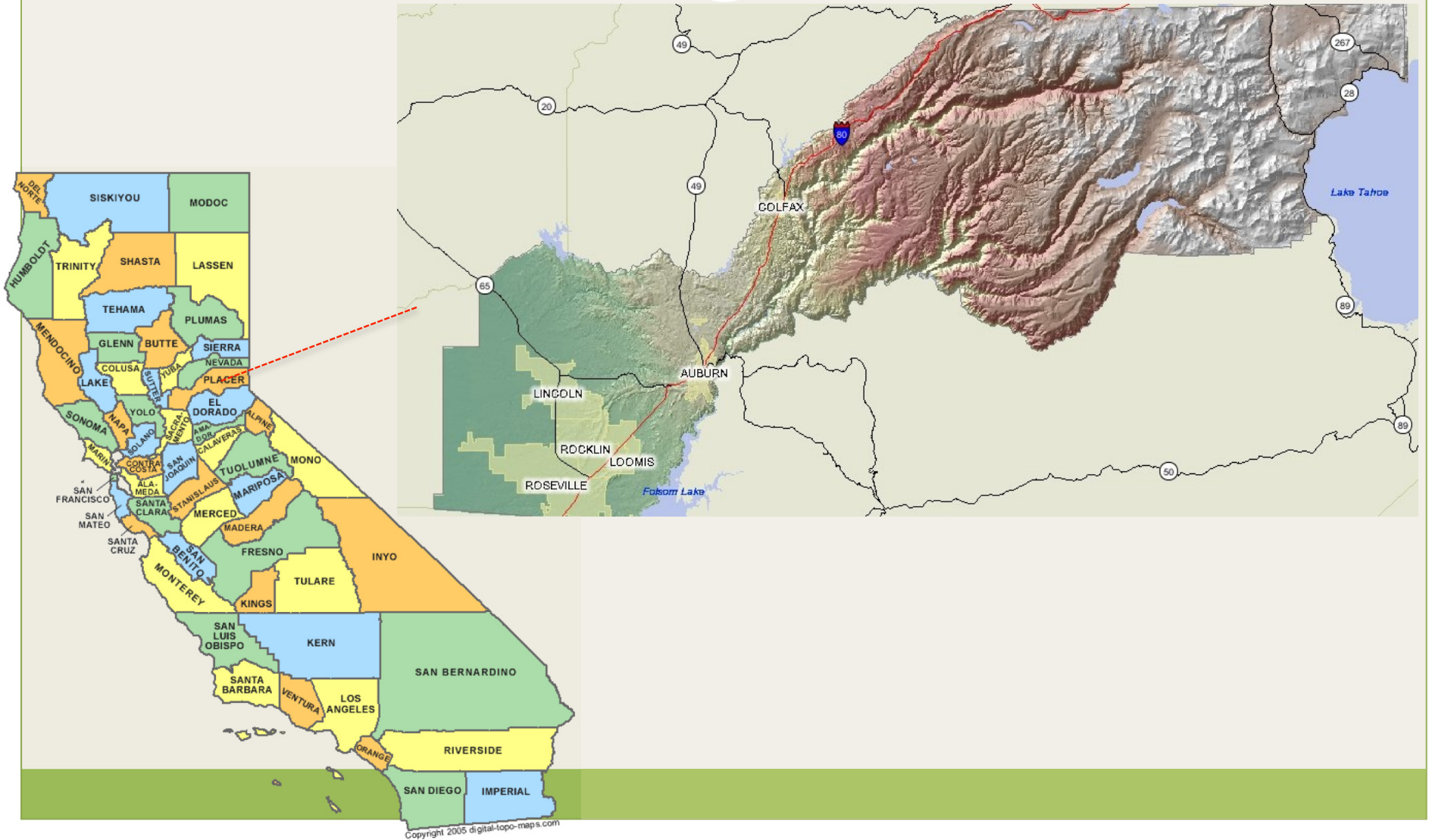
**FEBRUARY 4, 2012**

# Agenda



- Placer County Forested Landscape
- California Biomass Industry Overview
- Biomass for Energy Demonstration Project
- Biomass for Energy Greenhouse Gas Offset Protocol
- Other Forest Related Initiatives
- Development of California Air District Offset Exchange

# Placer County



# Placer County Landscape



- Sacramento Valley to Lake Tahoe
- 550,000 acres of forested land (> 50% of total county land), including three National Forests
- Oak woodlands in valley, mixed conifer in foothills and Sierra
- Numerous wildland-urban interfaces
- Heavy fuel loads throughout forested landscape from decades of fire suppression
- History of major wildfires in National Forests
  - Gap, Ponderosa, Star, Ralston, American River Complex, Angora – over 60,000 acres
- Land manager concerted effort for forest fuel hazard reduction thinning
  - By-product -- excess waste biomass

# Wildfire Impacts

**Ralston Wildfire, Sept 2006**



**Angora Wildfire, June 2007**



# 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.

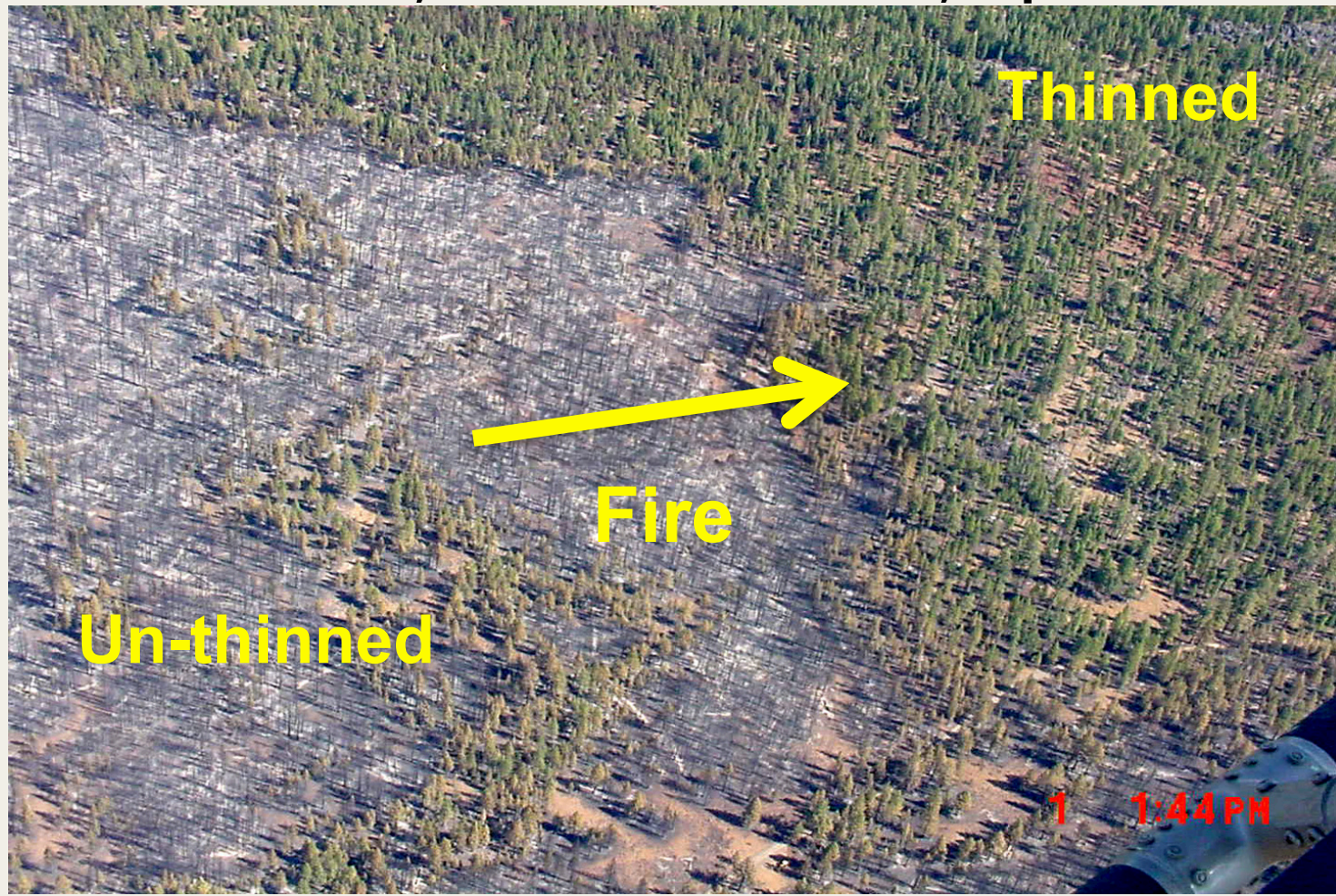
**Thinning by crews with chain saws, removing trees using tracked and rubber-tired equipment and prescribed fire are included in the project.**

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.”

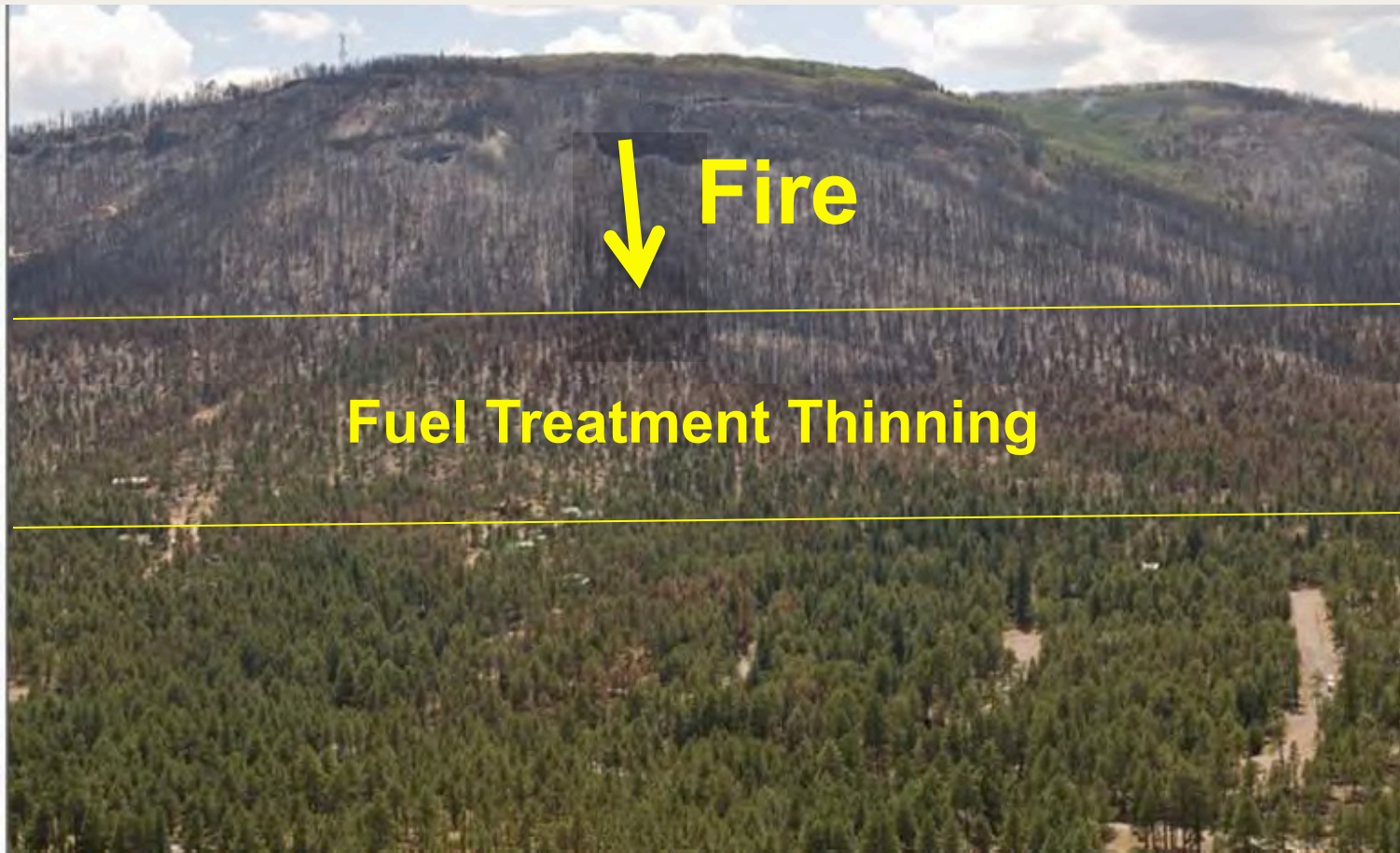
# Positive Effects of Fuel Treatments

Cone Wildfire, Lassen National Forest, Sept 2002



# Positive Effects of Fuel Treatments

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





# Existing Piles Prepared for Burning



## Tahoe National Forest



# Woody Biomass Wastes



# Open Burning

**Cost to chip and transport biomass to bioenergy facility**



**>**

**Price paid by bioenergy facility for biomass fuel**

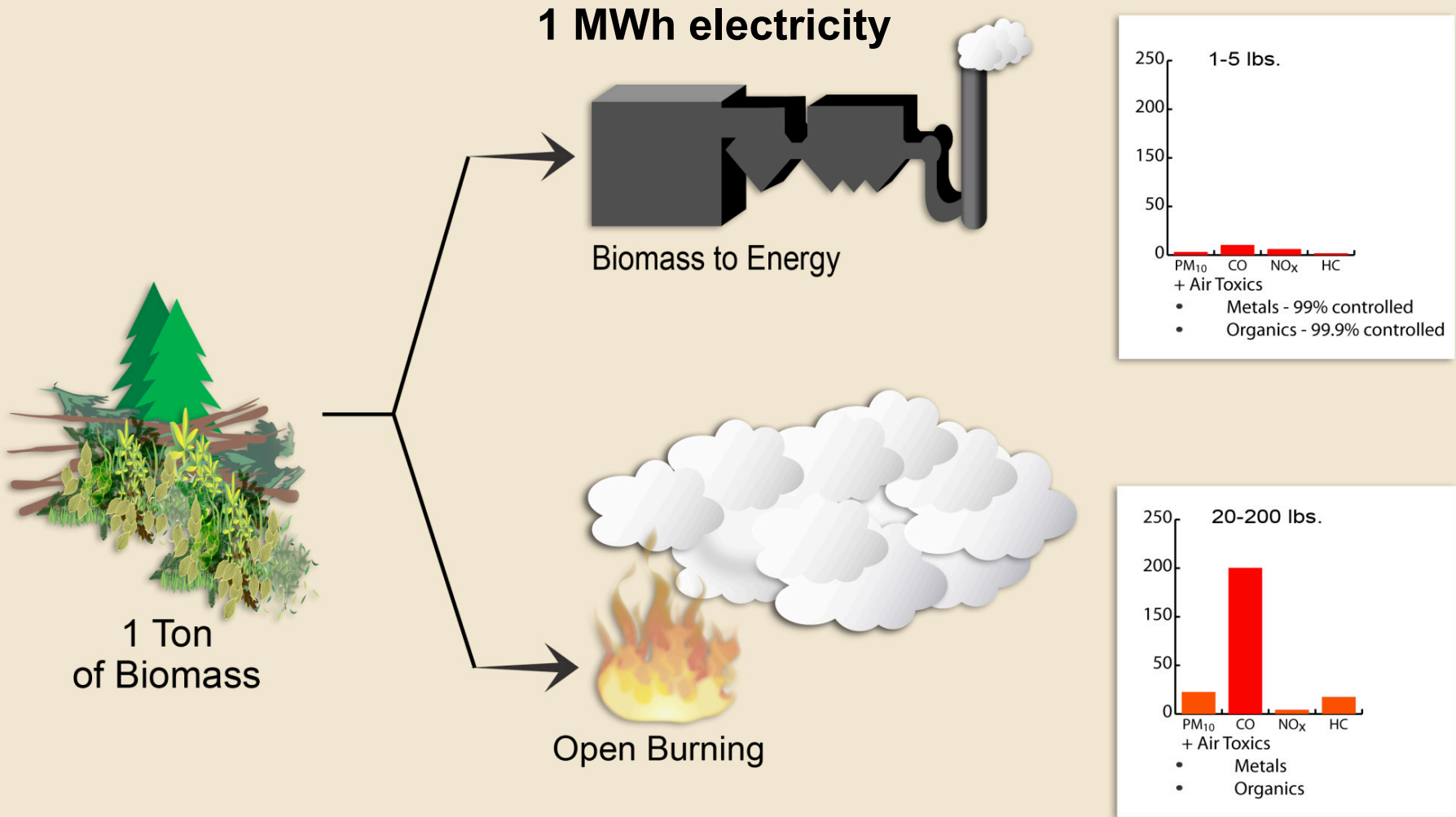


# Woody Biomass Utilization



- A variety of value-added end uses have evolved over time – Some are commercially proven and some are still in the RD&D
  - Lumber products, composite panels, pulp
  - Soil amendments
  - Densified fuel pellets
  - Animal bedding
  - Landscape/landfill cover
  - Bio-based products (plastics, solvents, etc.)
  - Biofuels (ethanol, renewable diesel)
  - Biochar
  - Electricity and heat generation

# Air Pollution Benefits



# Biomass Energy

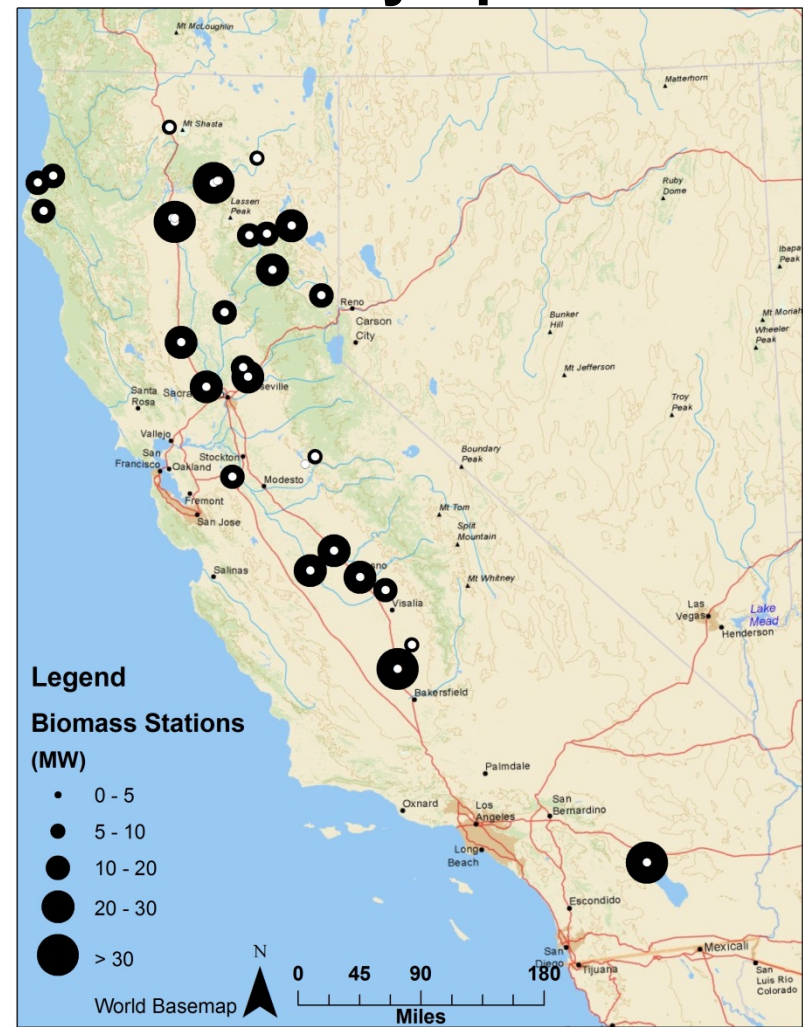


- Numerous biomass energy facilities in District
- Significant benefits:
  - Net improvement in air quality – reduction in criteria air pollutants and toxic air contaminants
  - Greenhouse gas reduction -- displacing fossil fuel
  - Baseload, 24/7 renewable energy
  - Supports hazardous fuels reduction and healthy forests
    - ✦ Watershed – water quality, quantity, timing
    - ✦ Wildfire – reduces size and intensity
    - ✦ Ecosystem services – recreation, habitat protection
  - Provides employment (4.9 jobs/MW)
  - Reduces waste material destined for landfills



# California Biomass Industry

23 currently operational

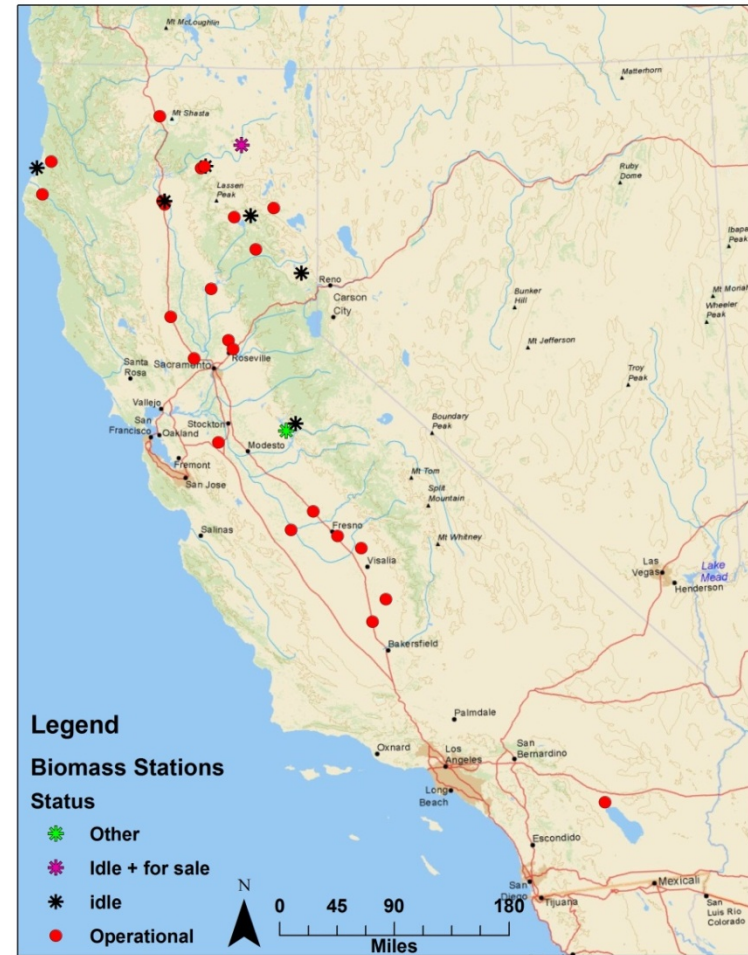
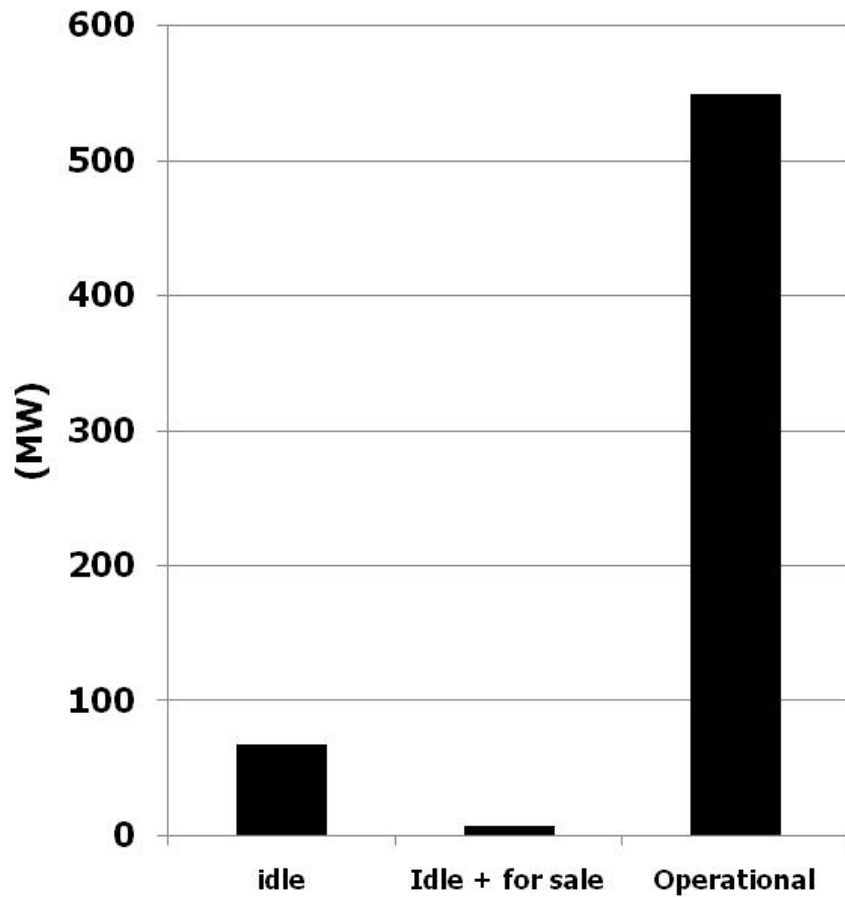




# Status



### Total Capacity



# Open Burn vs Renewable Energy

**Open Pile  
Burn**



**VS**



**Grind and Haul Biomass Waste**



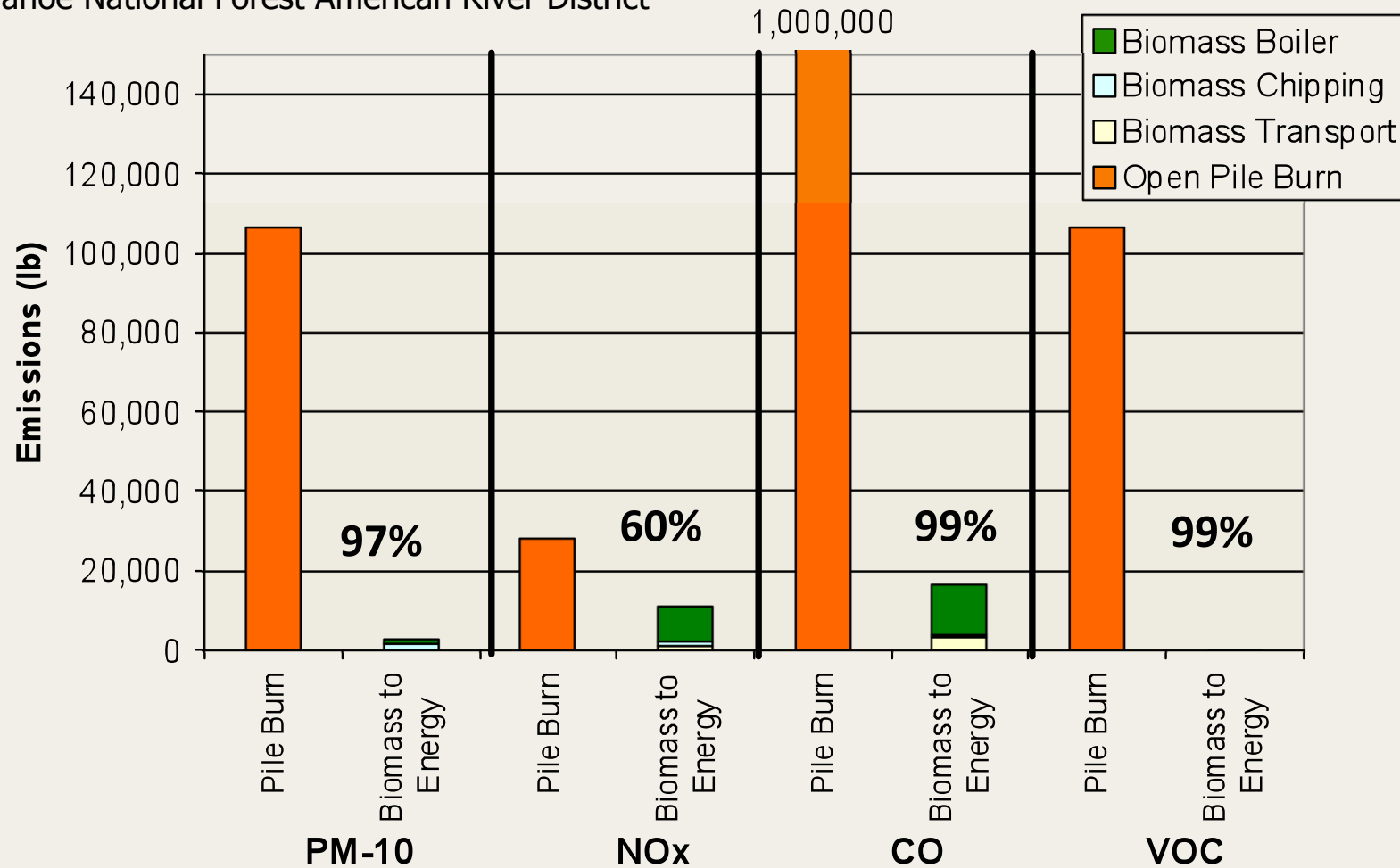
**Controlled Energy Generation**

# Demonstration Project



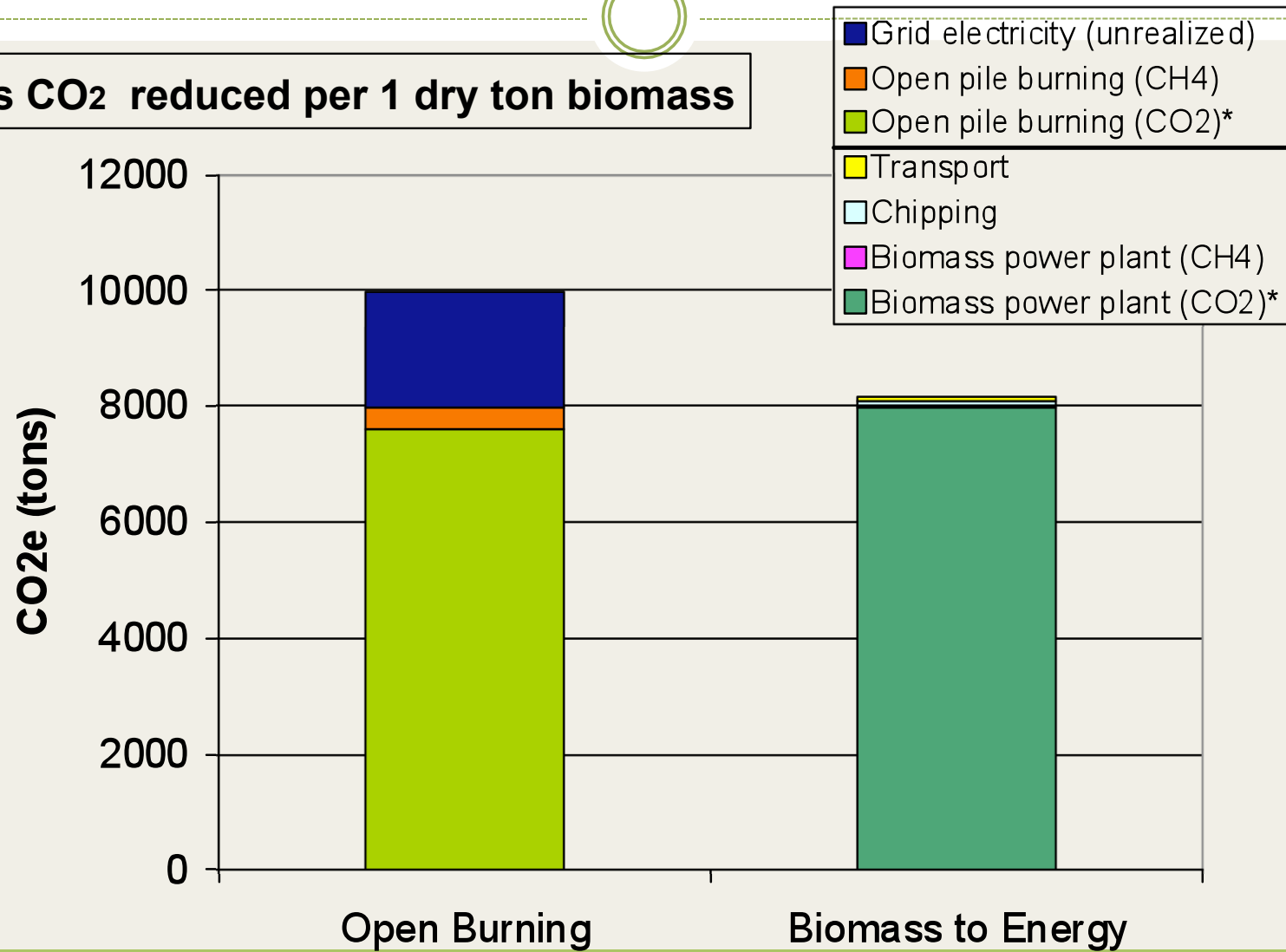
# Criteria Air Pollutants

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



# Greenhouse Gases

**0.4 tons CO<sub>2</sub> reduced per 1 dry ton biomass**

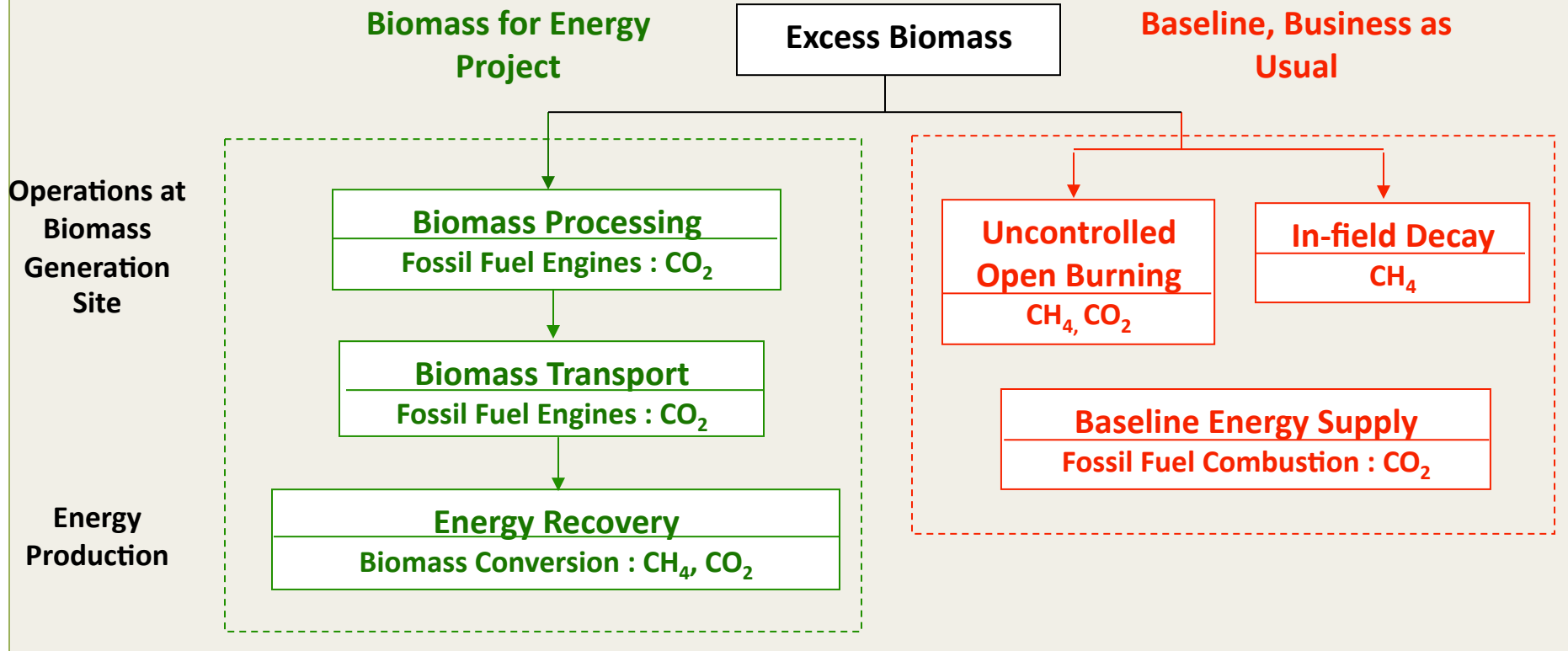


# Biomass for Energy Project Greenhouse Gas Protocol



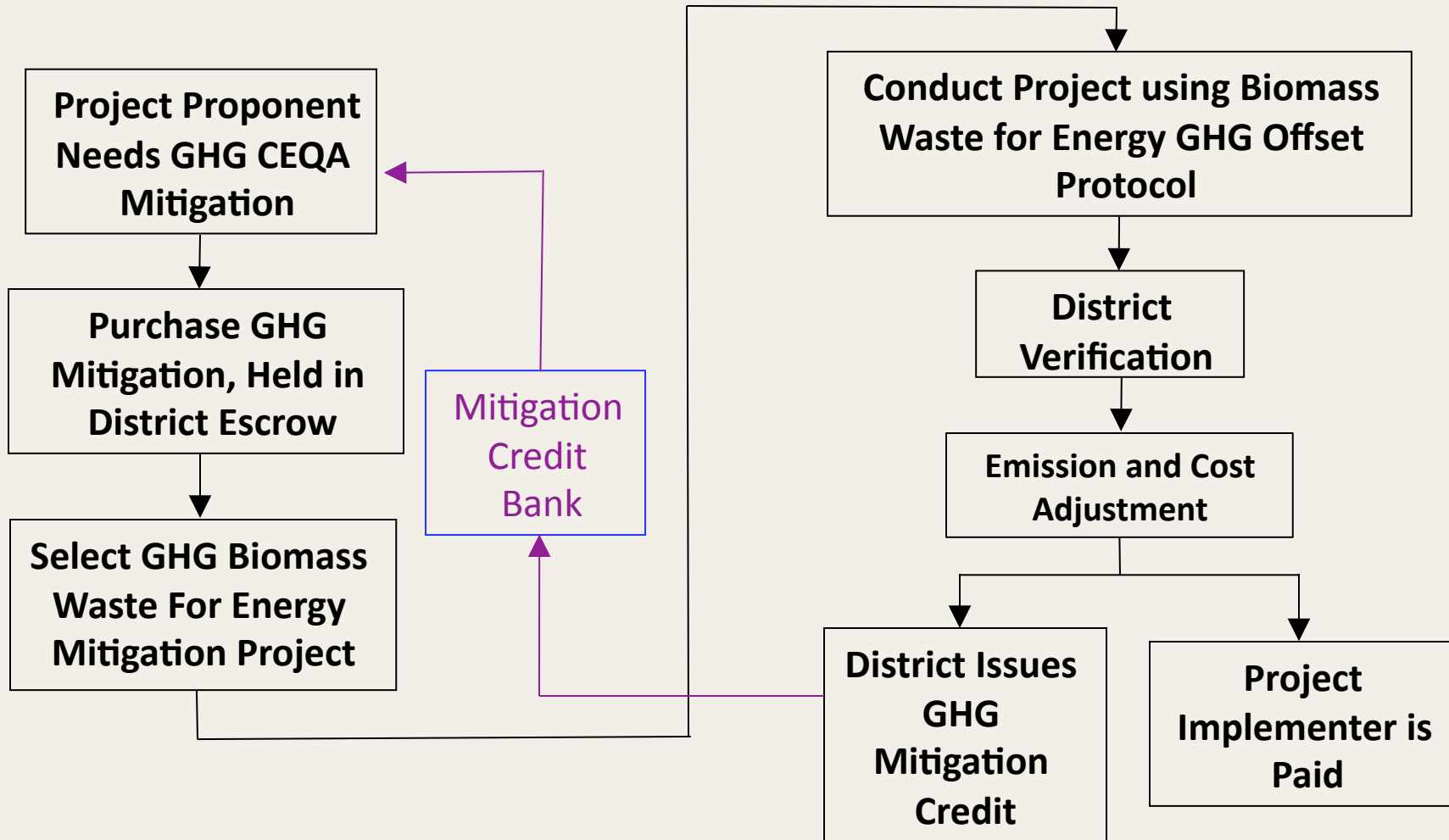
- Utilize excess biomass wastes for energy as alternative to baseline business as usual (open burning)
  - Monetary support for biomass processing and transport to energy facility
- Greenhouse gas benefits result from:
  - Avoided methane from open pile burning
  - Renewable biomass energy displaces fossil fuels
- Endorsed by:
  - California Board of Forestry
  - California Air Districts, including San Joaquin, South Coast, Mendocino, Butte, Feather River
- Applicable for use to provide offsets for CEQA mitigation purposes
- Follows format of the Climate Action Reserve's Livestock Manure GHG Offset Protocol

# Protocol Accounting



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

# Project Implementation





# Other Placer County / Placer Air District Initiatives

- Support the establishment of state-of-the-art biomass facilities
  - Tahoe Region Combined 2 – 3 MW Heat & Power (US DOE Grant)  
30,000 BDT/yr sustainable woody biomass resources within 30 mile radius
  - Foresthill Region Bio-Methane Fuel Initiative (CA Energy Com Grant)  
50,000 BDT/yr sustainable woody biomass resources available within 30 mile radius
  - Support for multiple small DG biomass facilities located throughout rural communities in the Sierra Nevada's
- Advocating for a Wildfire Hazard Reduction Adder as a component of the Feed-In-Tariff rulemaking by the California Public Utilities Commission
- Quantifying benefits derived from implementation of the Placer County Conservation Plan (PCCP)
- Funding research with USFS to evaluate the GHG benefits of forest fuel thinning -- avoided wildfire and enhanced forest growth

# Development of California Air District Offset Exchange



- Joint effort of several air districts
  - Leverage decades of experience with Emission Reduction Credits (ERC's) for criteria pollutants
  - Uniquely positioned to offer assistance to businesses, others
  - Keep local investments, jobs, and benefits in California
- Complementary to state cap-and-trade program
- Fill a niche for GHG mitigation for CEQA, NEPA, work to expand uses in future

# Purpose of Exchange



Goal is to provide a trusted source of high quality California-based greenhouse gas offsets to keep investments, jobs, and benefits in-state, through a California Air Pollution Control Officer's Association (CAPCOA) developed and operated Exchange. The focus will be to provide credible mitigation options for project developers. Financial resources invested in-state will help create local jobs, and realize needed air pollution co-benefits from projects in California.

# Core Values & Operating Principles



- Quality California Offsets
- Collaboration
- Integrity
- Security
- Transparency
- Low Transaction Costs
- Excellent Customer Service
- Protocol Development

# Placer County Air Pollution Control District Award

- U.S. Environmental Protection Agency Recognizes Outstanding & 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”*



