

# **Placer County Biomass Program**

*An Overview of the Initiatives  
Challenges and Opportunities*

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**Presented at**

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# Placer County Air Pollution Control District

- Special District (9 member governing board)
- Located within 3 separate Air Basins
- Programs include:
  - Permitting and inspections of stationary sources
  - Enforcement of Air Pollution Control Laws and Regulations
  - Air Monitoring
  - Air Quality Planning – CEQA/NEPA & Attainment/Transport
  - Clean Air Grants and Incentive Programs
  - Public Outreach
  - Air Toxics
  - Implement Special Projects to reduce Air Pollutants
  - Manage Open Burning such as Agricultural/Forestry

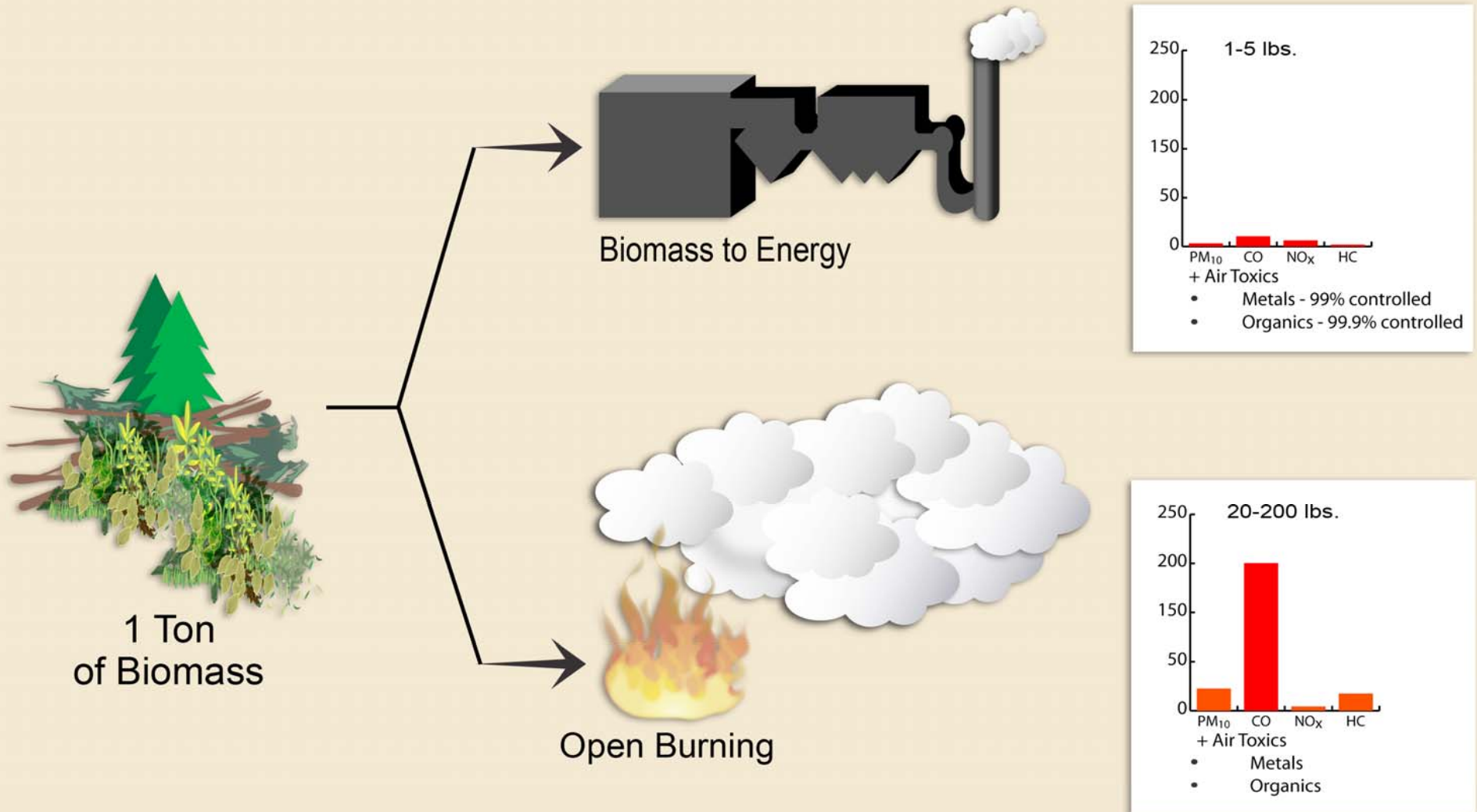
# Placer County Statistics

- Sacramento Valley to Lake Tahoe
  - Valley, foothills, mountains
- Exploding population, rapid development
- 550,000 acres of forested land (> 50% of total county land)
- Three National Forests
  - Lake Tahoe Basin Management Unit
  - Tahoe National Forest
  - Eldorado National Forest
- High property values, many wildland urban interface
- Recent major wildfires
  - Gap, Ponderosa, Star, Ralston, American River Complex
- Population : 330,000



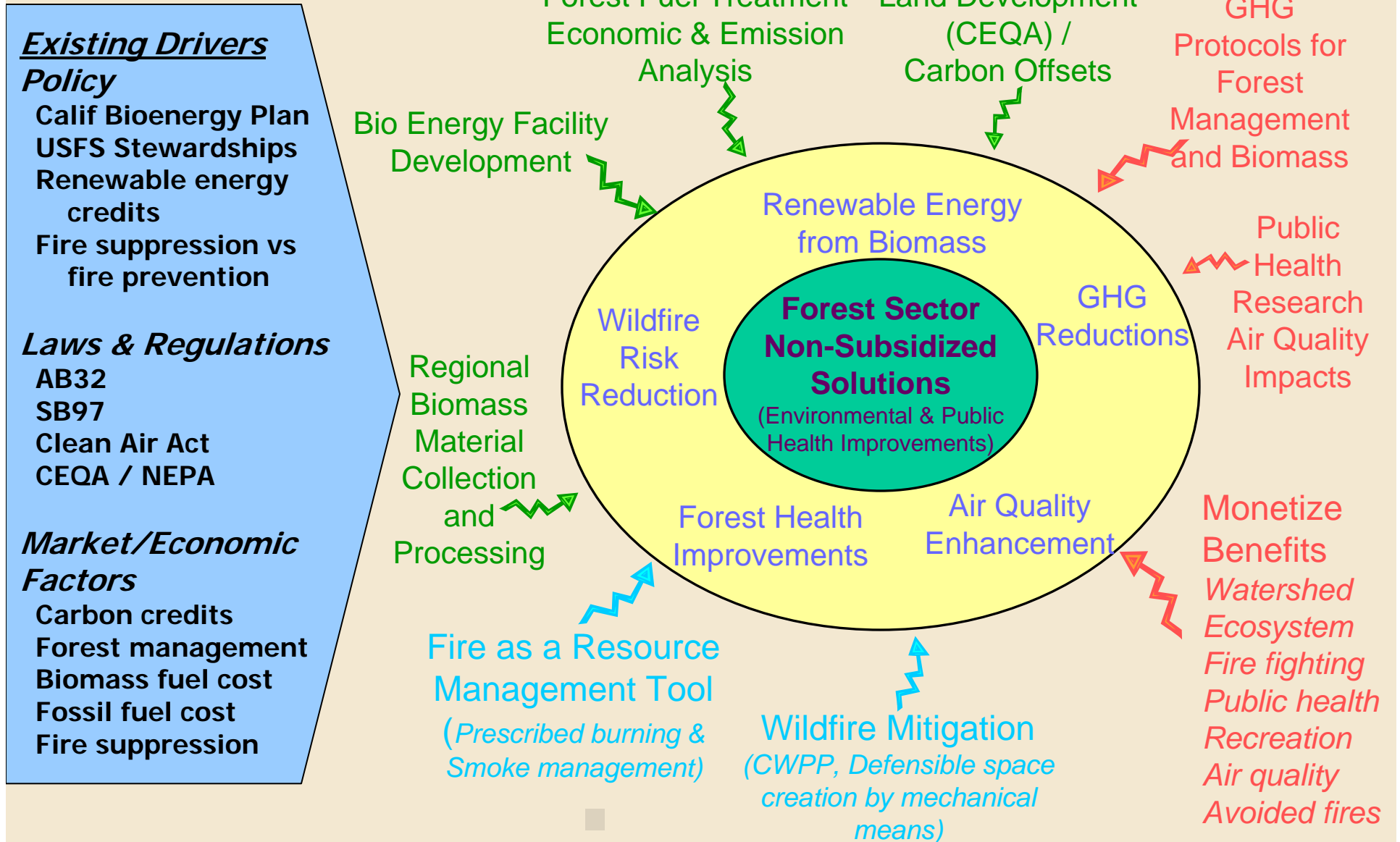
# Air Quality Comparison

(Relative emissions)



Note: Other emissions not included are: Transport and firefighting related; localized emissions impact from fuel processing plant; fugitive dust after burns; emissions from forest decay.

# Placer County's Biomass Program

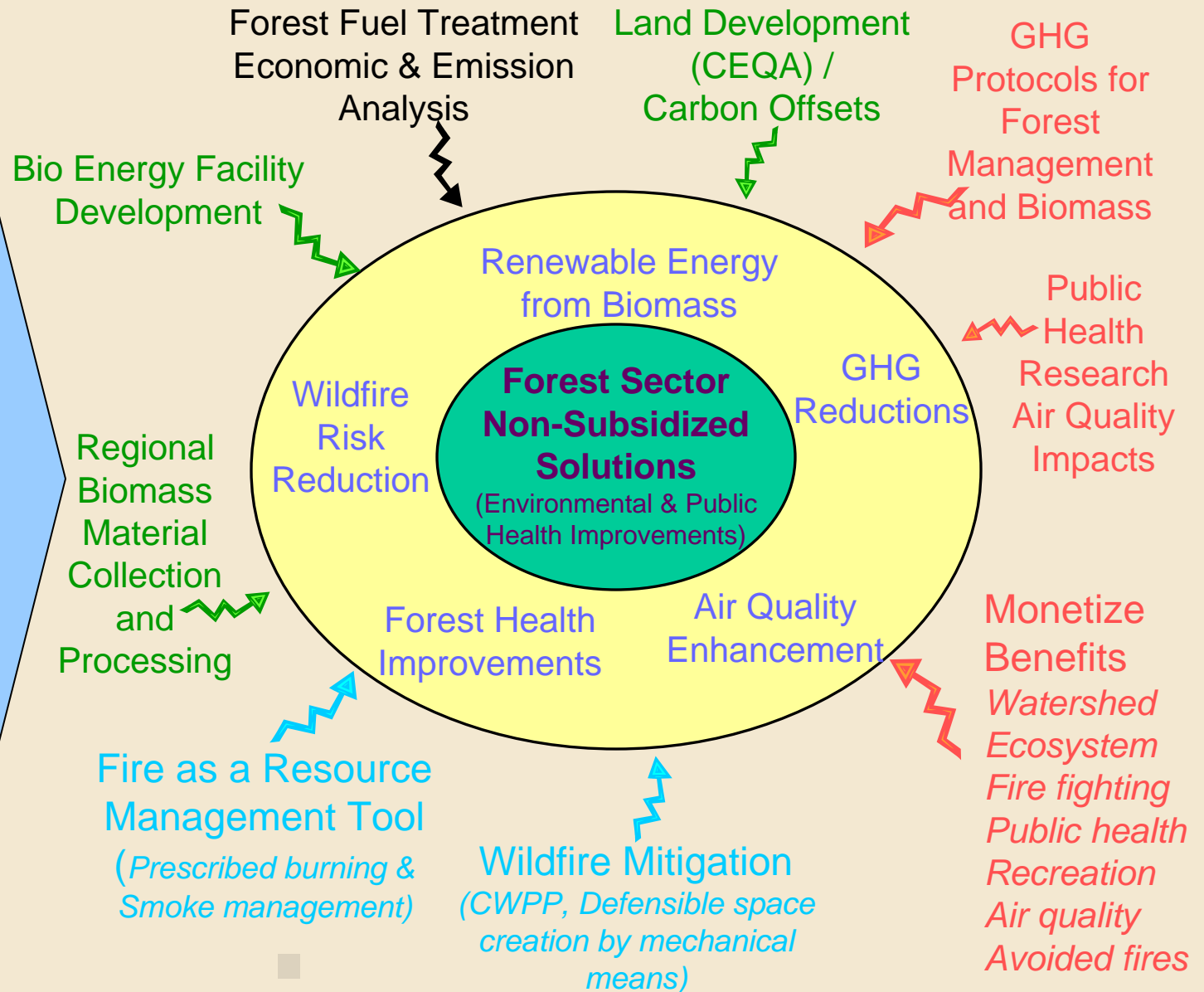


# Placer County's Biomass Program

**Existing Drivers**  
**Policy**  
 Calif Bioenergy Plan  
 USFS Stewardships  
 Renewable energy credits  
 Fire suppression vs fire prevention

**Laws & Regulations**  
 AB32  
 SB97  
 Clean Air Act  
 CEQA / NEPA

**Market/Economic Factors**  
 Carbon credits  
 Forest management  
 Biomass fuel cost  
 Fossil fuel cost  
 Fire suppression



# Forest Fuel Treatment Economic and Emission Analysis

## Case Study Demonstration Project :

- Post-harvest Slash Piles, Tahoe National Forest (Foresthill, CA)
- Chipping and transport to biomass to energy facility (Lincoln, CA), 60 miles
  - 10,000 green tons (5,000 BDT)
  - Excellent fuel quality – 9,000 Btu/lb, 40% moisture
  - 5,800 MW electricity produced

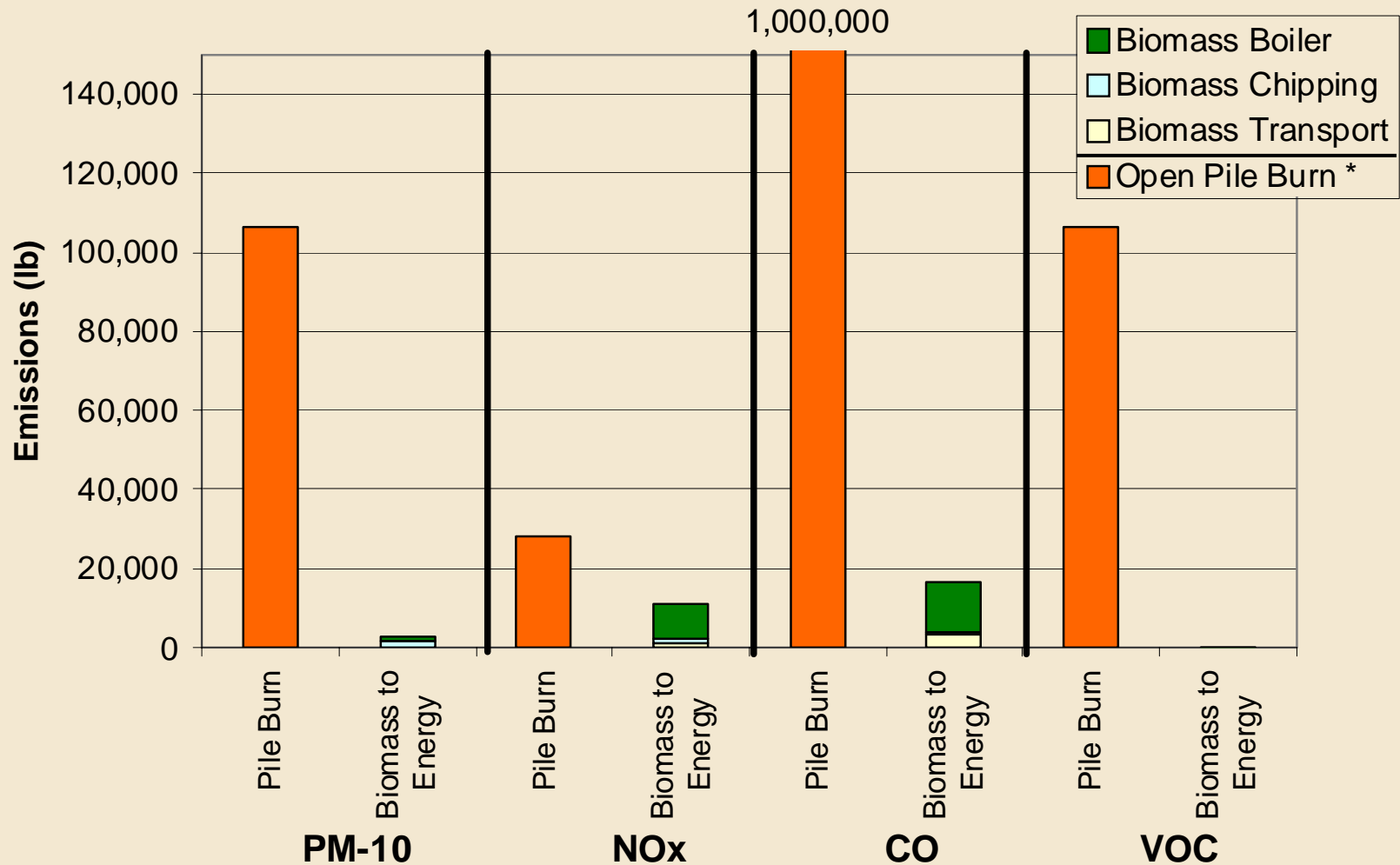
## Economics:

- \$55/BDT (\$3.25/MMBtu), working to increase operating efficiency



# Forest Fuel Treatment

## Criteria Air Pollution Emission Reductions 4,200 BDT forest slash



\* Emissions from pile burning of Sierra Nevada tree species – data sources including CARB and EPA AP-42 compilations, and recent pilot scale studies and literature review.

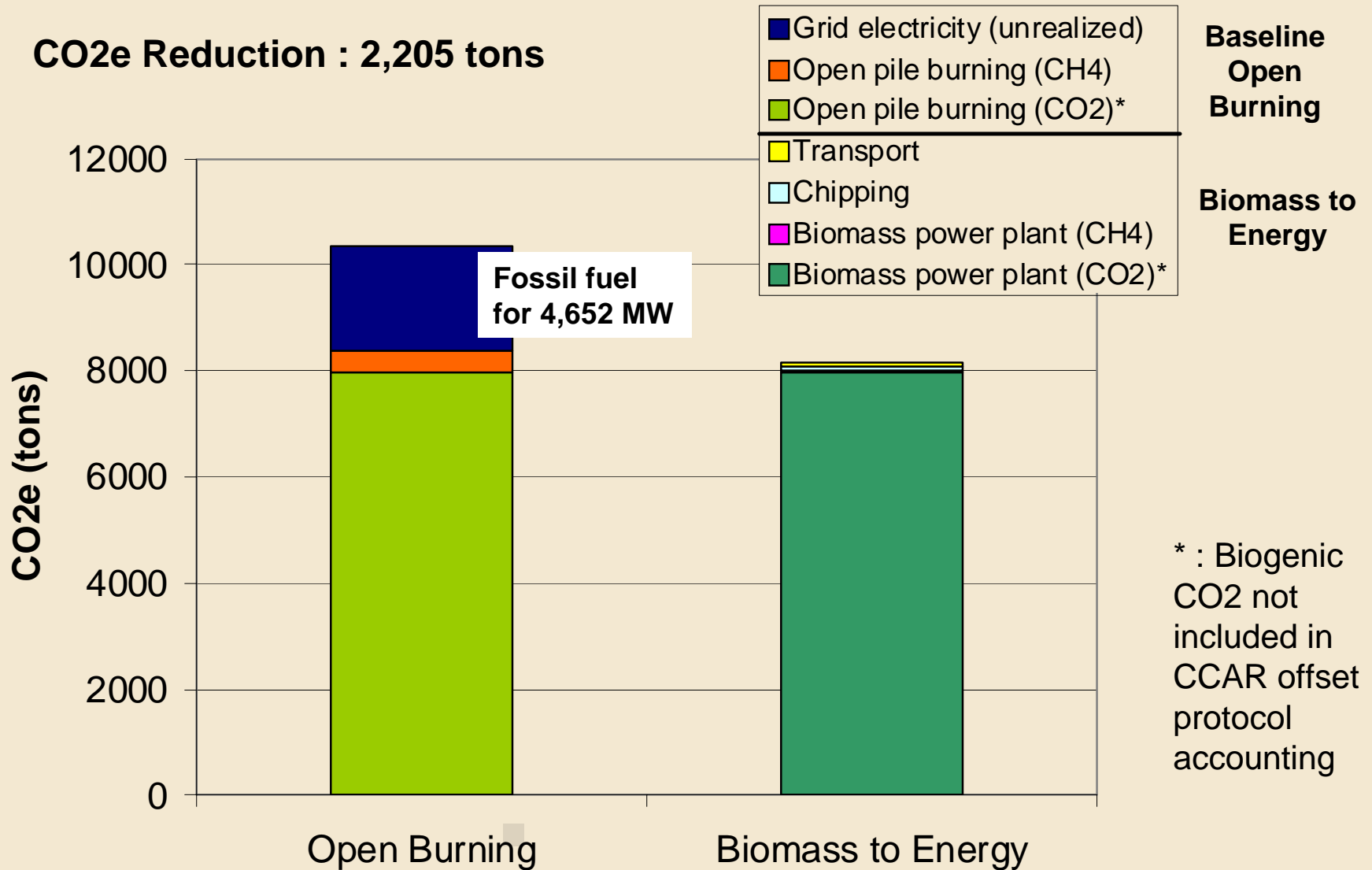


# Forest Fuel Treatment

## Greenhouse Gas Emission Reductions

4,200 BDT forest slash

**CO2e Reduction : 2,205 tons**

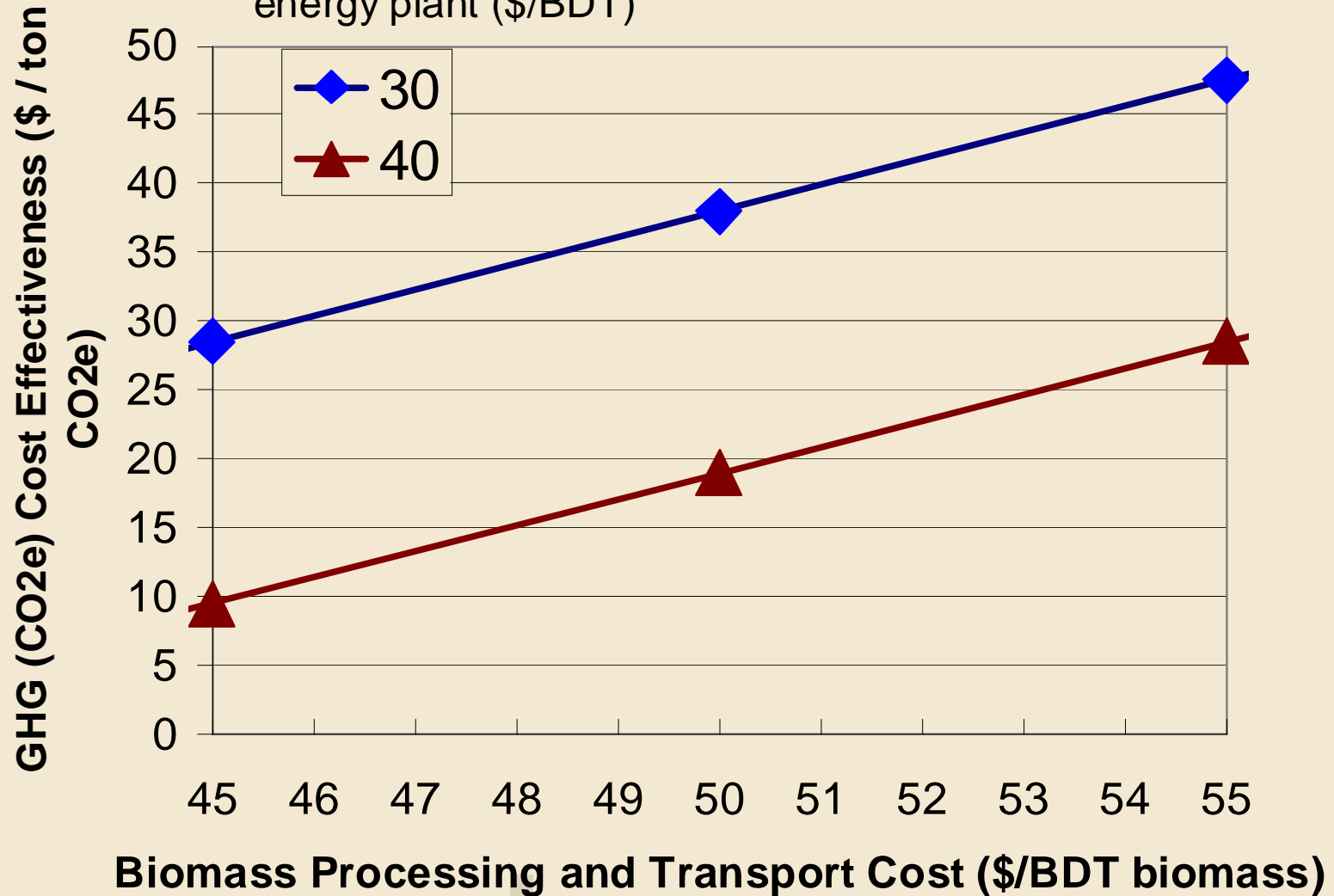


\* : Biogenic CO2 not included in CCAR offset protocol accounting

# Forest Fuel Treatment

## *CO<sub>2</sub> Cost Effectiveness*

Biomass fuel value at biomass to energy plant (\$/BDT)



# Forest Fuel Treatment

## *Benefits to the Watershed*

- USFS rehabilitation & planting of genetically superior seedlings
- Net increase in water yield
- Forest more fire resilient
- Less erosion

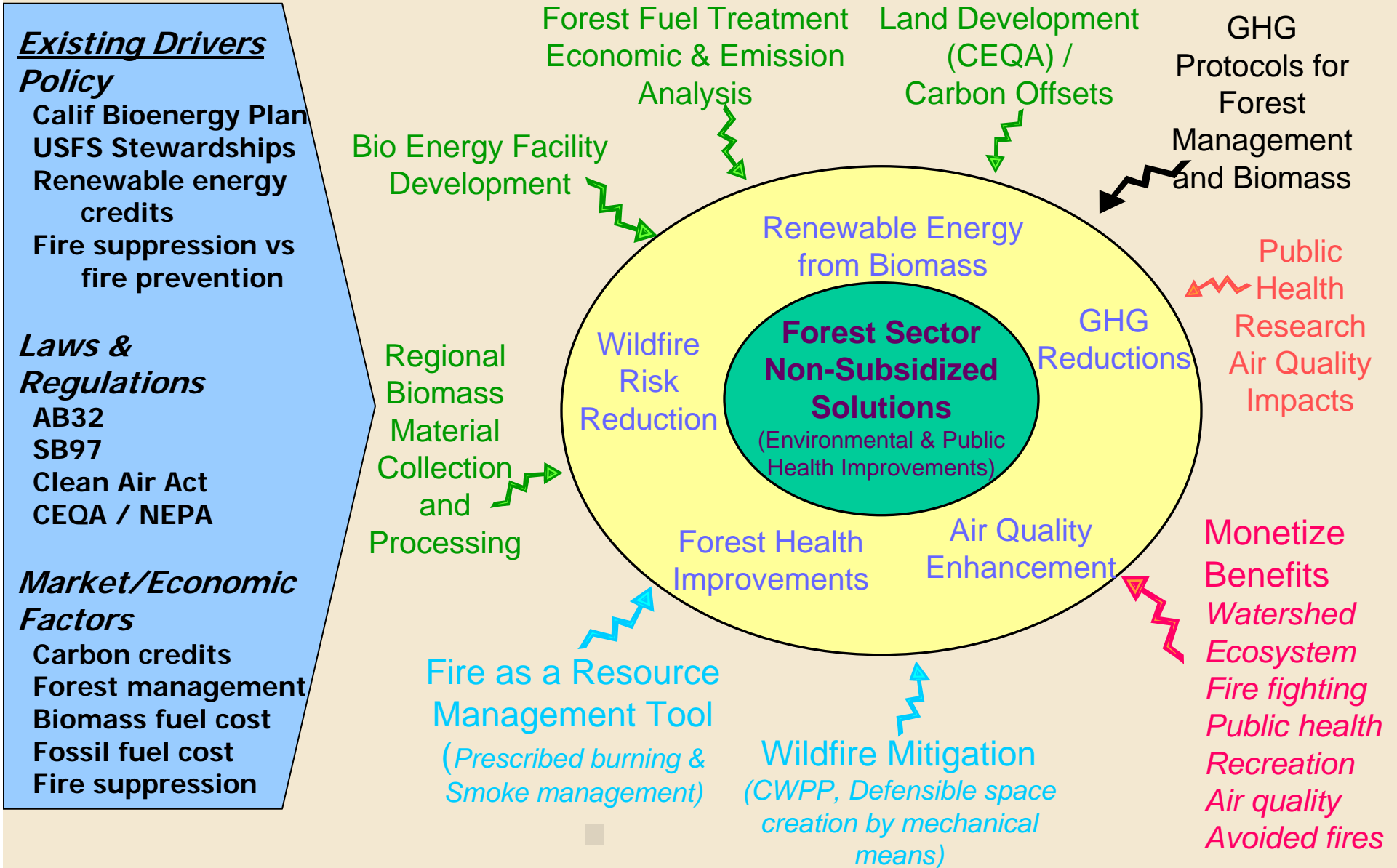


**Before**



**After**

# Placer County's Biomass Program



# GHG Protocols for Biomass and Forest Management

## *Protocol Status*

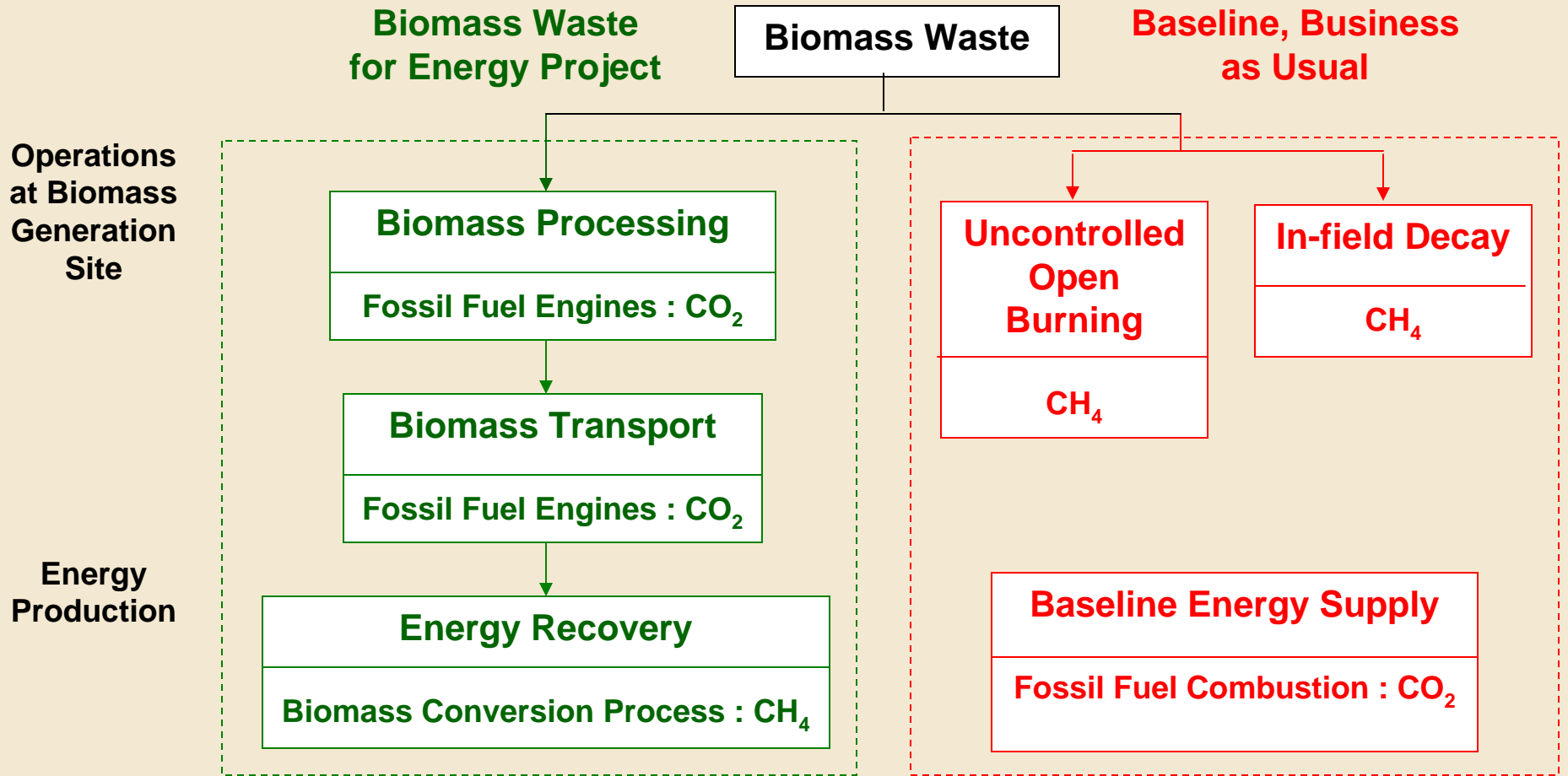
- Reforestation and Conservation
  - CCAR\* Protocols – adopted, currently in process of revision
- Urban Forestry
  - CCAR\* Protocol – adopted Sept. 2008
- Biomass Waste for Energy
  - Fully supported by Placer County Air Pollution Control District
  - To be completed Sept. 2009
- Forest Fuel Treatment -- Wildfire Reduction, Enhanced Forest Growth
  - Partial support of \$150,000 by Placer
  - U.S. Forest Service team – End of 2011

\* California Climate Action Registry

Protocols ensure GHG offsets are Real, Permanent, Quantifiable, Enforceable, and Verifiable, as required under CA H&SC Section 38562(d)(1).

# GHG Protocols For Biomass and Forest Management

## Biomass Protocol



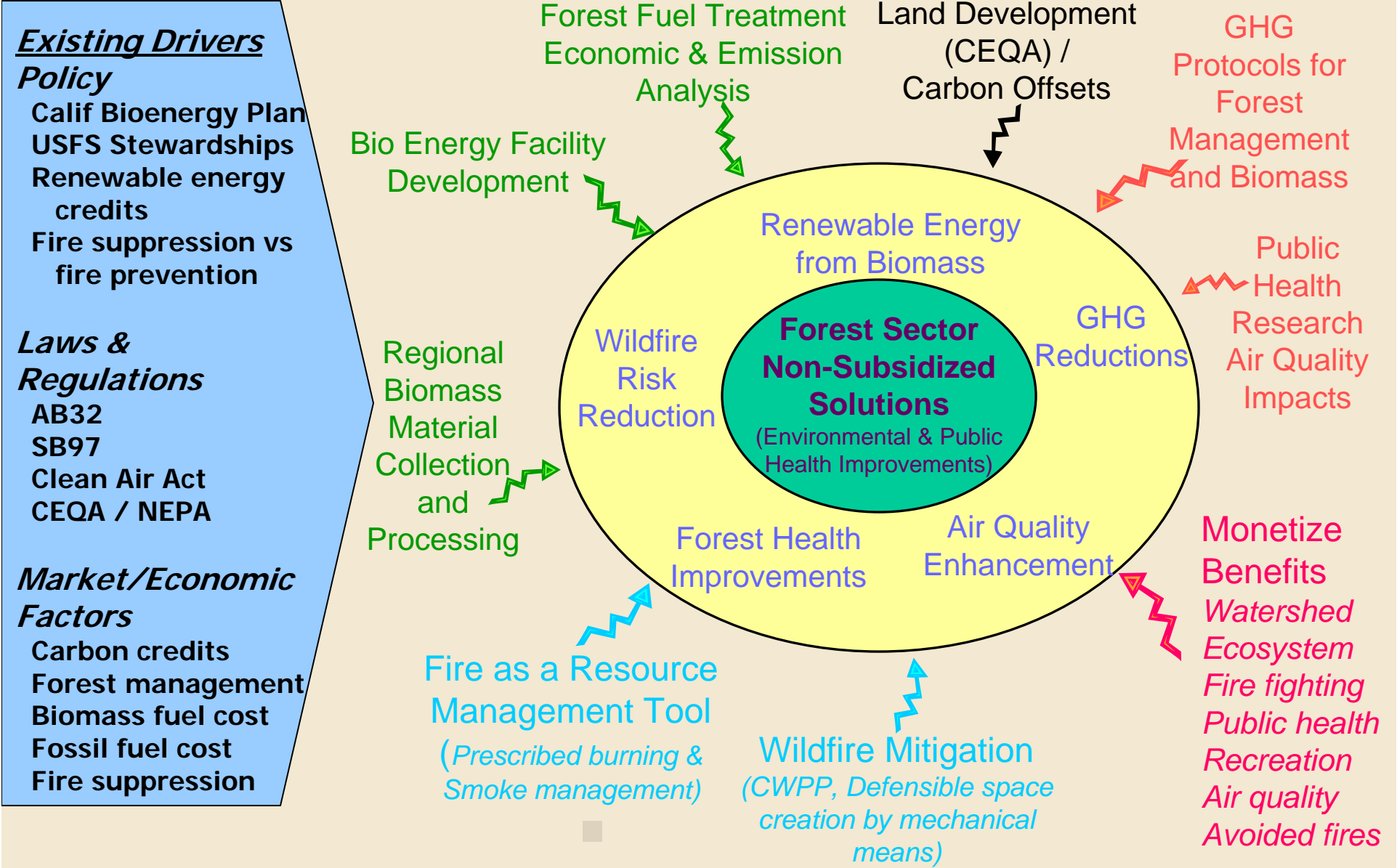
$$\text{GHG}_{\text{Reduction}} = \text{GHG}_{\text{Open Burn}} + \text{GHG}_{\text{Decay}} + \text{GHG}_{\text{Baseline Energy}} - \text{GHG}_{\text{Biomass Energy}} - \text{GHG}_{\text{Biomass Processing}} - \text{GHG}_{\text{Biomass Transport}}$$

# GHG Protocols for Biomass and Forest Management

## ***Forest Fuel Treatment: Wildfire Reduction and Enhanced Forest Growth Protocol***

- Quantify GHG reductions for forest fuel treatment projects
  - Wildfire reduction – size, intensity
  - Forest growth rate enhancement
- “Baseline business as usual” vs “forest fuel treatments”
- Experimental research to correlate and validate models
- Research Team
  - U.S. Forest Service Pacific Southwest Research Station, U.C. Berkeley, and Spatial Informatics Group

# Placer County's Biomass Program





# Land Development (CEQA) / Carbon Offsets

- Land Development Project review
  - CEQA Review to determine GHG impacts
    - Credit on-site GHG reduction activities
  - Mitigation to below significance
- Off-site GHG Mitigation Program
  - Cost of GHG at market rate
  - PCAPCD to issue credits by applying funds to viable carbon beneficial projects
    - Forest management protocols
- Schedule
  - GHG Mitigation program targeted for implementation in 2009

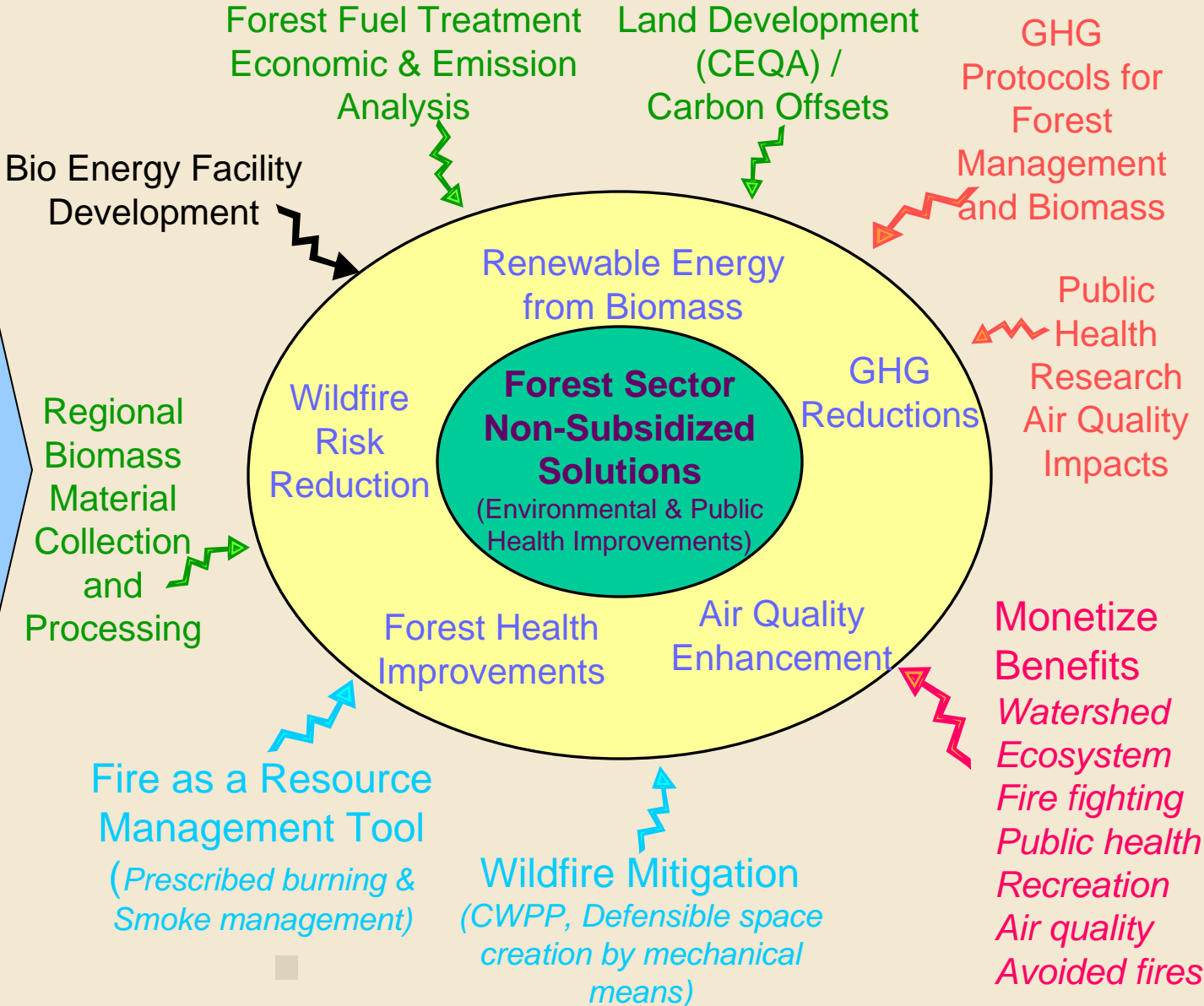


# Placer County's Biomass Program

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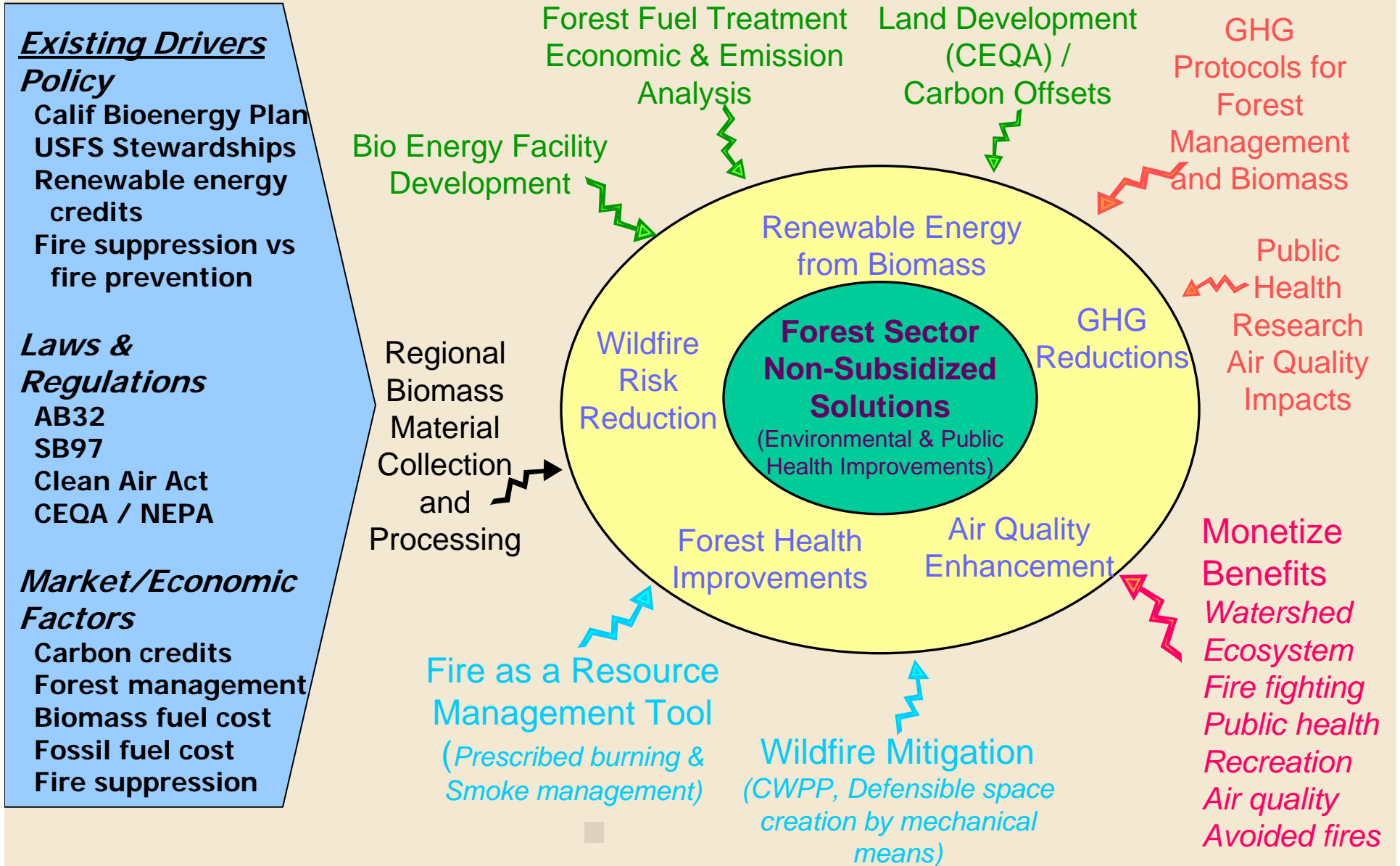
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# Bio Energy Facility Development

- System in Lake Tahoe Basin
  - Conversion methods
    - Combustion
    - Gasification
    - Pyrolysis
  - Technology Assessment Evaluation Criteria
    - Technology development status, operating experience
    - Air and water impacts
    - Economics
    - Operability, reliability
  - Cogeneration : 1 - 3 MW, hot water for heating and cooling
  - 10,000 BDT biomass / year
  - Target date: 2011 - 2014
  - USFS, Placer County, DOE and congressional grants of more than \$2 million

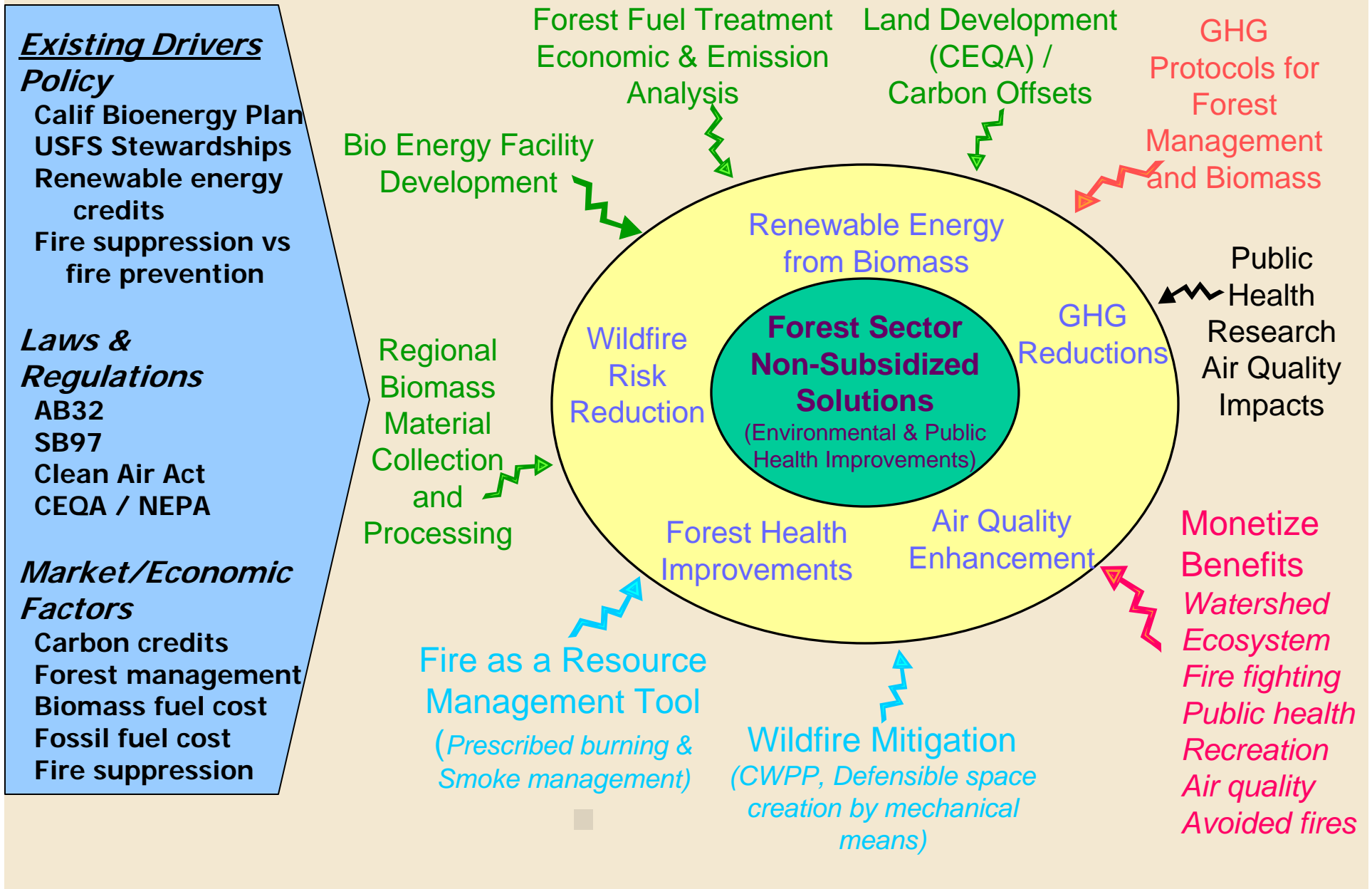
# Placer County's Biomass Program



# Regional Biomass Collection

- Efficient biomass waste collection, processing, and delivery to energy recovery facility
  - Reduce biomass open burning, disposal in landfill
- Implementation
  - Municipal urban wood waste -- Material Recovery Facilities, recycling cans
  - “Biomass Boxes” -- centrally located for defensible space clearing
  - Regional collection yards for processing and transport
- Achievements
  - 2007 : 600 tons
  - 2008 : 3,400 tons
- Resources
  - Federal and local grants: \$200,000 for two years

# Placer County's Biomass Program



# Public Health Research Air Quality Impacts

- Understand link between air quality and medical impacts in Placer County
  - Ambient air data -- PM, ozone
  - Hospital records -- mortality, respiratory and cardiovascular, lost worker / student time
- Identify promising mitigation measures, with emphasis on children
- Community training and involvement
- Resources
  - UCLA School of Public Health, under direction of Placer County Department of Health and Human Services
  - \$150,000 in grants from Calif. Endowment, PCAPCD, and Placer County Wildfire Protection & Biomass Utilization Program
- Schedule
  - Jan. 2008 – Dec. 2009



# Challenges and Opportunities

- Challenges

- Biomass fuel availability
- Biomass fuel cost
- Facility location
- Facility size
- Air permitting
  - Offsets may be needed in non-attainment regions.  
Emission reduction credits in short supply

- Opportunities

- Renewable energy credits, carbon credits



# Biomass Emission / Economic Process Model

