CALIFORNIA BIOMASS

CLEANING THE AIR, REDUCING GHG

California Biomass Energy Alliance, LLC

BIOMASS A GREEN ENERGY SOURCE

- Biomass power plants combust wood waste to produce electricity — waste that would otherwise create adverse environmental impacts

- Biomass fuels

  - **Agricultural** waste like orchard prunings, rice hulls, fruit pits, etc.
  - **Forest** waste like small trees and undergrowth cleared from forests for fire suppression and growth enhancement
  - **Urban** wood waste like construction wood scraps, broken pallets, clean wood waste from factories and residue from tree trimmers

- California's fleet of biomass plants burn the fuel in controlled boilers to produce steam, which drives a turbine, which turns a generator that converts power into electricity

- A reliable base load electric power source — able to provide a steady flow of power regardless of external conditions

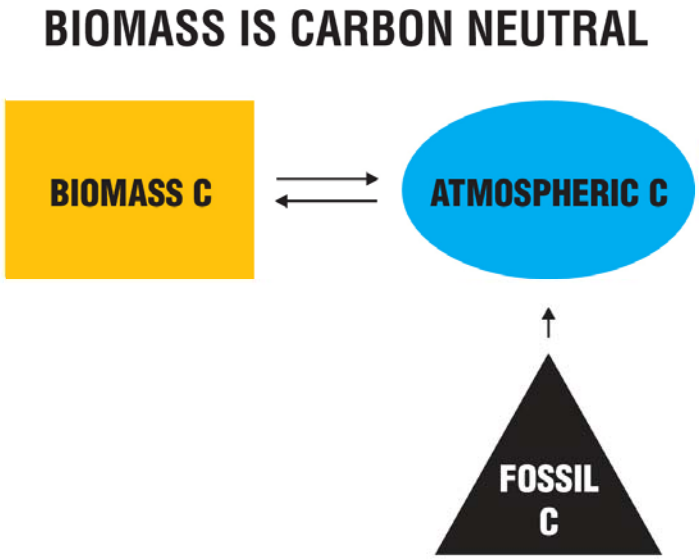
BIOMASS ESSENTIAL FOR CALIFORNIA

- A clean, renewable alternative to fossil fuel plants
  - Needed to help California meet renewable energy mandates (AB 1078 / SB 107)
- Diverts about 2.25 million tons of urban wood waste from landfills each year
  - Needed to help local governments meet landfill diversion mandates (AB 939)
- Has a **net negative** impact on greenhouse gas (GHG) emissions
  - Diverting waste from high-emission conventional disposal like landfill disposal and agricultural field burning, actually reduces GHG emissions
  - Will help California meet mandated GHG reductions (AB 32)

BIOMASS ESSENTIAL FOR CALIFORNIA

GHG and Biomass

- Biomass is Carbon Neutral
  - When plants and trees grow they absorb carbon, and when they die they release carbon … as part of nature
  - So when organic matter (biomass) is used as a fuel, it is utilizing existing carbon … adding no new carbon to the atmosphere — it is carbon neutral

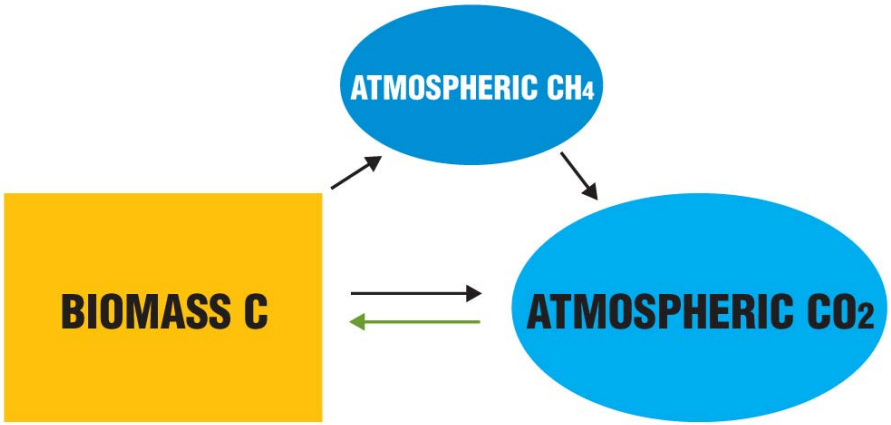


- Fossil Fuels “Create” New Carbon
  - Fossil fuels (which “contain” carbon) are trapped beneath the ground, inaccessible to the atmosphere
  - When fossil fuels are accessed and used, they release new carbon into the system

BIOMASS ESSENTIAL FOR CALIFORNIA

How Biomass Is Used Makes a Big Difference

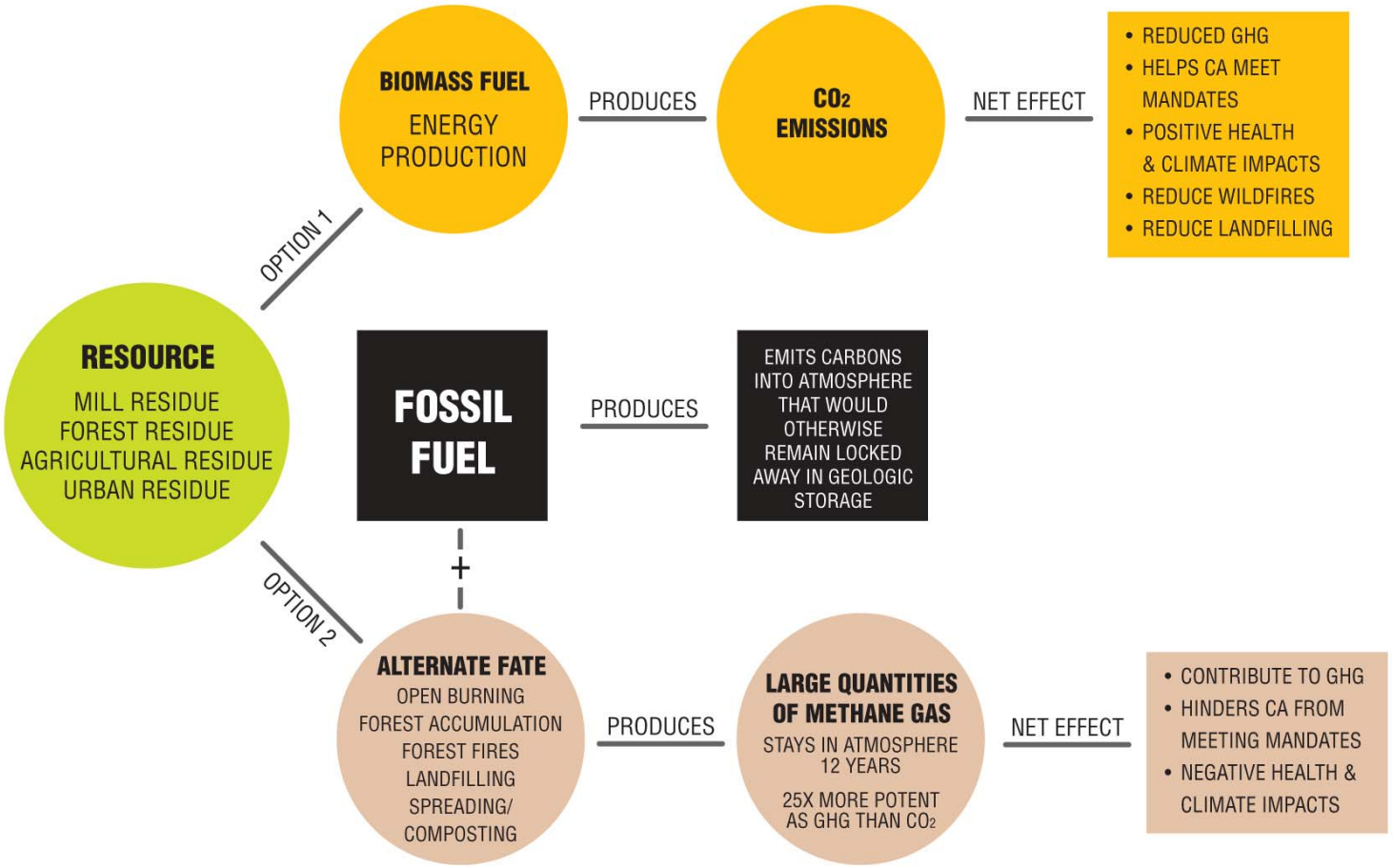
- The amount of “standing” biomass (trees) grows or declines over time — as the number of trees in a forest changes from year to year — sequestering or releasing net carbon to the atmosphere
- Carbon is released to the atmosphere in either carbon dioxide (CO_2) or methane (CH_4) form — the way it is released is very important
- “Reduced” or non-combusted carbon (CH_4) is the worst — being 25 times more potent as a greenhouse gas — and is greater in open burning and especially landfilling



- Biomass power plants minimize methane

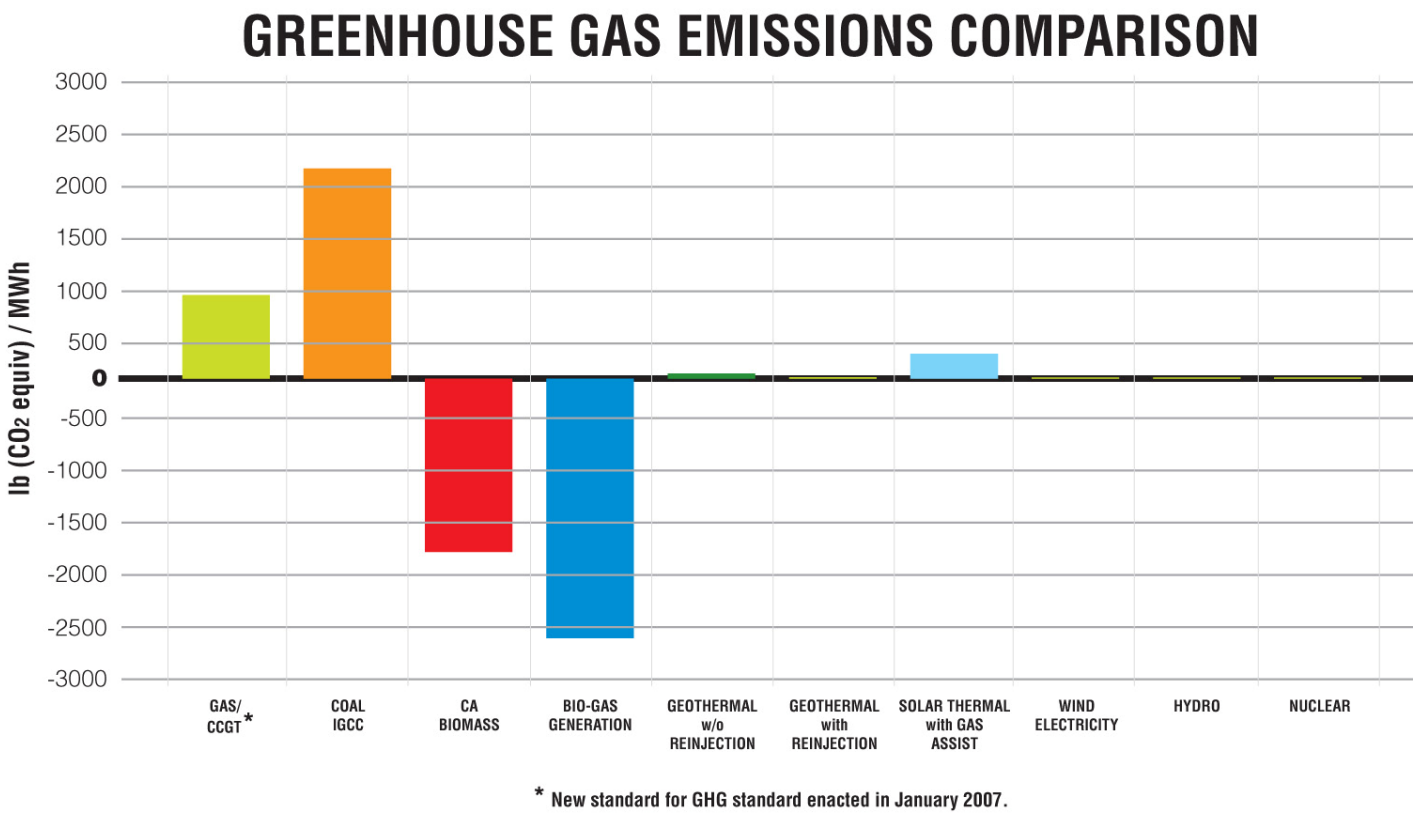
BIOMASS ESSENTIAL FOR CALIFORNIA

BIOMASS' NET NEGATIVE GHG IMPACT



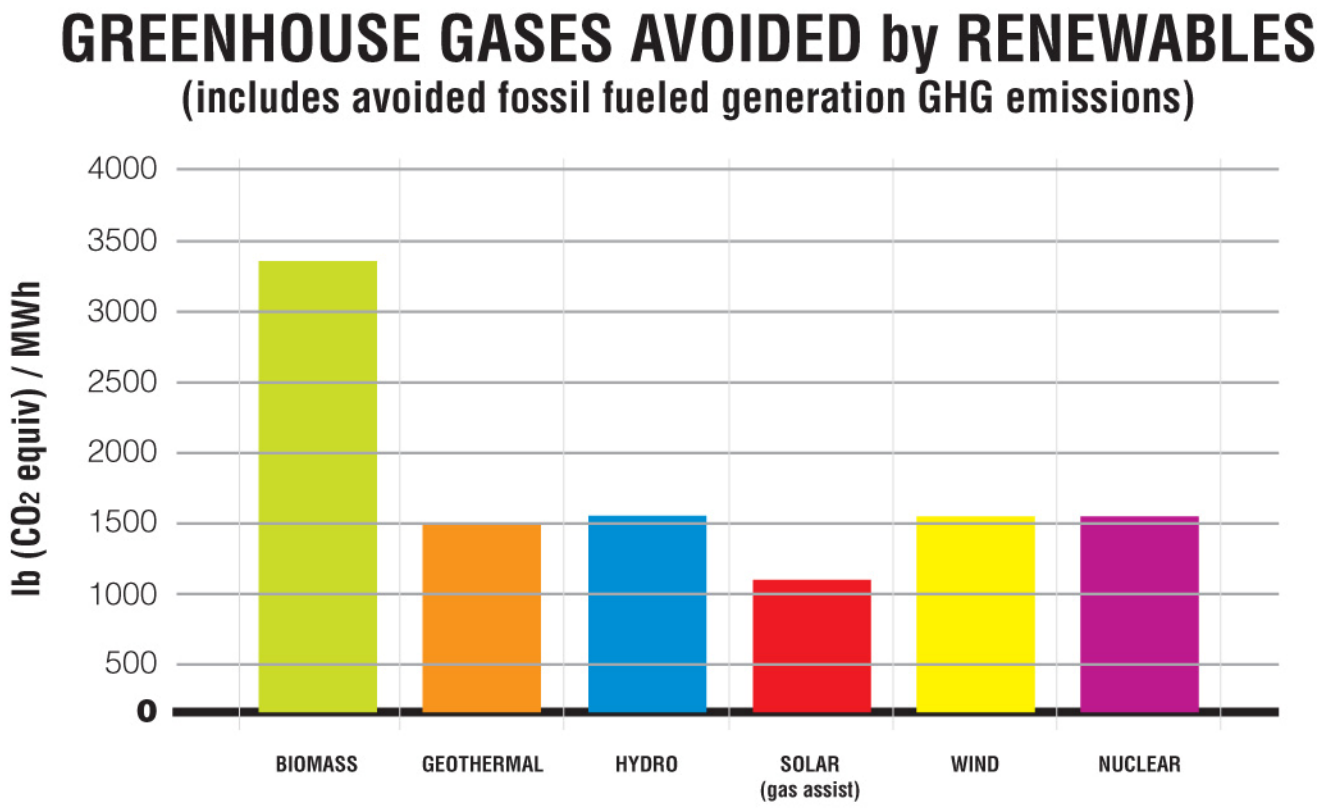
BIOMASS GOOD FOR THE ENVIRONMENT

- GHG emissions for biomass (and biogas) are “negative” compared to others due to avoidance of open burning and landfill disposal



BIOMASS GOOD FOR THE ENVIRONMENT

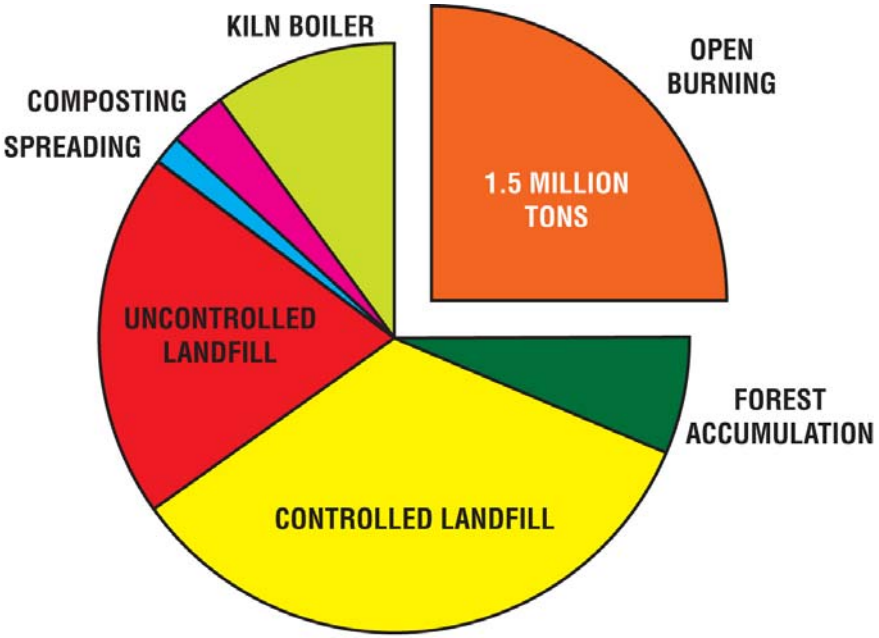
- Biomass is at least 2x more effective in reducing GHG emissions than any other type of renewable technology, or nuclear



BIOMASS GOOD FOR THE ENVIRONMENT

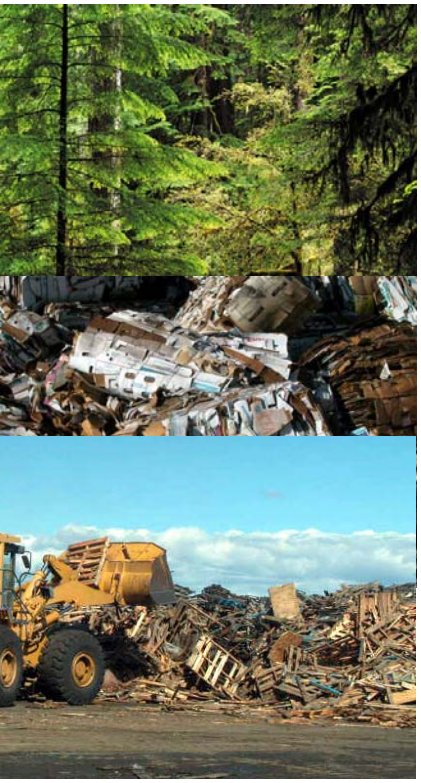
- Reduces Criteria Pollutants
  - By preventing open-field burning of 1.5 million tons of agricultural waste each year, biomass plants cut criteria pollutants up to 98%

AVOIDED METHODS OF WOOD WASTE DISPOSAL



CUTS CRITERIA POLLUTANTS UP TO 98%

BIOMASS GOOD FOR THE ENVIRONMENT

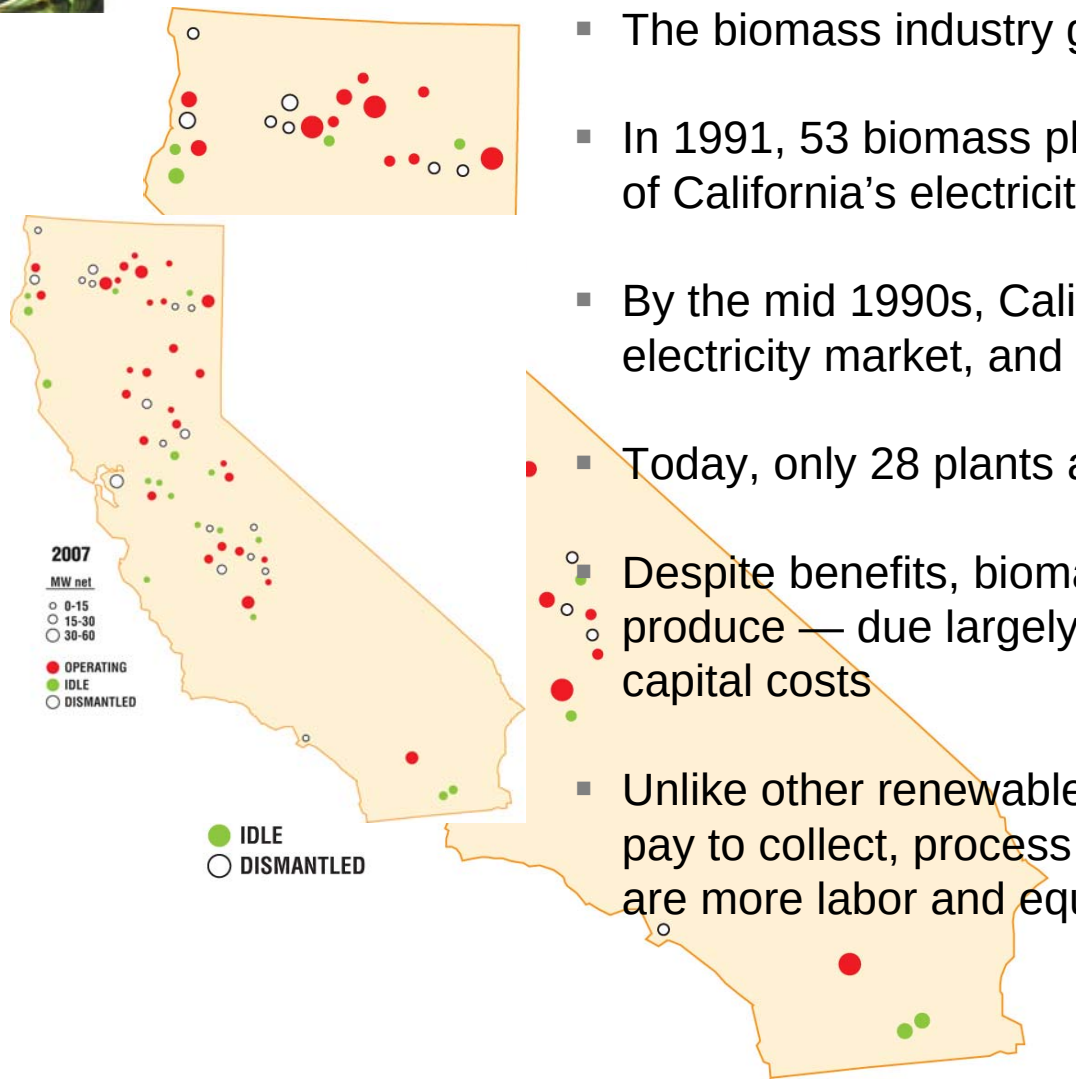


- Other Environmental Benefits
  - Improves forest health by diverting 1.3 million tons of forest waste annually, reducing the threat of forest fires that endanger lives and property, and contribute to air pollution and GHG emissions
  - Diverts 2.3 million tons of urban wood waste from landfills annually
  - In total consumes 7.8 million tons of biomass annually. At its peak, consumed more than 10 million tons per year

BIOMASS WHO PAYS FOR IT

- Ratepayers help pay the higher cost of biomass energy — among other sound energy investments — through a small Public Goods Charge (PGC) added to each IOU ratepayers' electricity bill, and which is then distributed by the CEC
  - CEC has failed to distribute $12 million from this fund, while at the same time several biomass plants shut down
- Biomass' environmental benefits are not being rewarded, with the exception of a few emission offset credits
  - U.S. Department of Energy study concluded that the environmental benefits of biomass generation are worth at least 11-cents per KWh

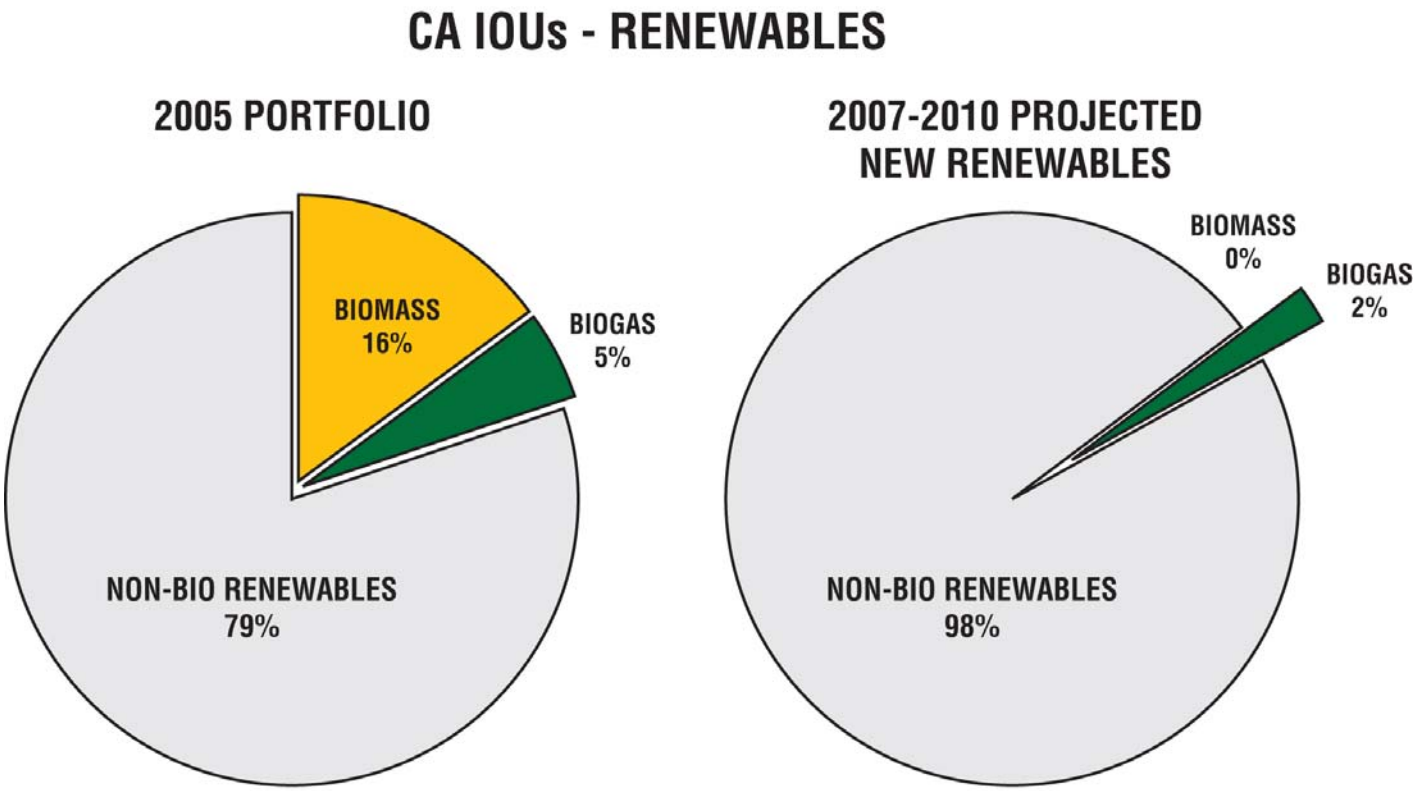
BIOMASS AN ENDANGERED CLEAN ENERGY SOURCE



- The biomass industry grew rapidly during the 1980s
- In 1991, 53 biomass plants generated almost 2% of California's electricity
- By the mid 1990s, California was restructuring its electricity market, and biomass was in decline
- Today, only 28 plants are operating, with 13 sitting idle
- Despite benefits, biomass power is more expensive to produce — due largely to fuel costs, but also higher capital costs
- Unlike other renewable technologies, biomass plants pay to collect, process and transport its fuels — and are more labor and equipment intensive

BIOMASS AN ENDANGERED CLEAN ENERGY SOURCE

- Most of the renewables in California today are procured by the three IOUs



BIOMASS COMPENSATION SHOULD MATCH BENEFITS

- Currently, biomass industry in California is not fully compensated for its many environmental benefits
  - Provides more than twice the GHG benefits of other renewables
  - Reduces landfilling
  - Reduces open burning of forest and agricultural waste
  - Promotes forest and watershed restoration activities

These benefits should be encouraged

BIOMASS KEEPING IT HEALTHY

California needs to preserve the biomass industry by:

- Restoring Public Good Charge (PGC) funding in the existing account at the CEC
  - Direct the CEC to work with biomass industry to implement an effective means to distribute funds to prevent future loses and maximize generation from existing plants
  - Alternately seek another source of revenue — such as a small surcharge on waste disposal bills as authorized in AB 939 (1989)
- Implementing the Governor's Executive Order as official state policy so that biomass-to-electricity should constitute 20% of the RPS
- Ensuring biomass power plants get credit for and retain their GHG offset credits
  - Should be reflected in reporting protocols
  - Ensure the proper valuation and quantification of GHG offset credits

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