Woody Biomass and Small Log Work Shop From Feedstock to Product

Policy Direction

Weed, California
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Strategic Value of Bioenergy

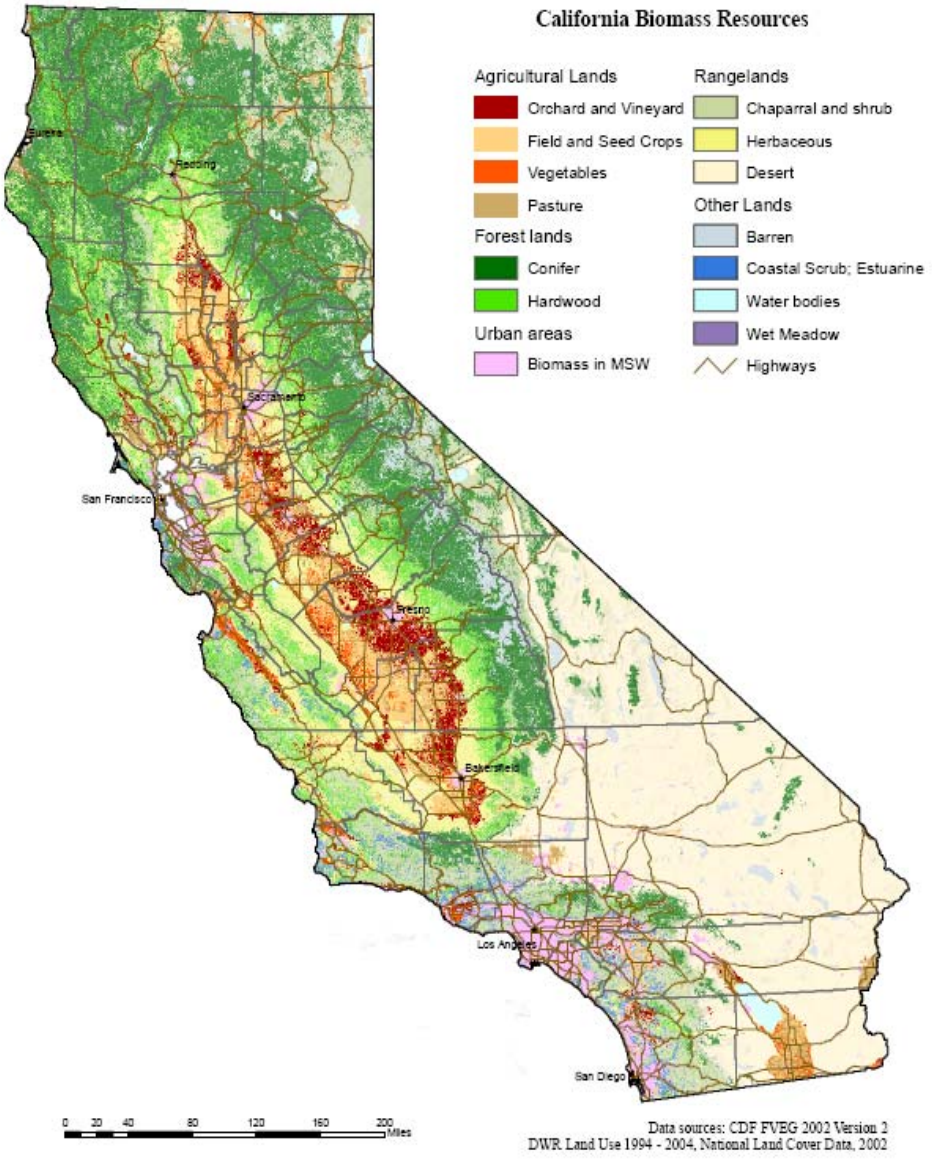
The U.S. has large, diverse and untapped biomass resources which can support greater use in electric power, fuels and chemicals.
U.S. Potential = 1.3 billion tons
California = 80 million dry tons

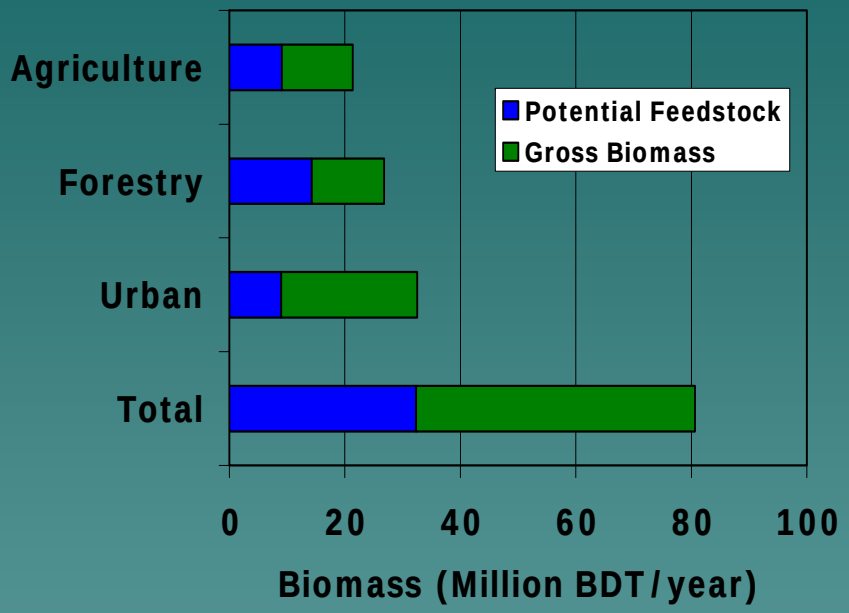
Biomass is an energy resource capable of achieving state petroleum reduction, climate change, renewable energy and environmental goals.

Use of biomass for energy production can address the U.S. and California's waste disposal and environmental problems, while creating local jobs.

Other public benefits include improving forest health and human and animal health, while avoiding catastrophic wildfires.

California Biomass Resources





Biomass is seen as a Waste Disposal Problem

- Reducing Landfill Capacity
  - About 40 million tons of biomass goes into landfills every year
- Contributing to Air Pollution and Fire Risk
  - Open field burning of crop residues emits more than 100,000 tons of air pollutants annually
  - Wildfires contribute over 1.1 million tons per year at a cost of >$900 million/year
- Over the last decade the 5 yr. average of wildfire acres burned has increased from 250,000 to over 500,000
- Local Concerns
  - California's 1.7 million dairy cows generate odor and health concerns

California Government Initiatives

- In April 2006, Governor Schwarzenegger signed Executive Order S-06-06, directing state agencies to develop a consistent state policy to promote sustainable biomass production and use.
- In July 2006, the Governor released the State of California's Bioenergy Action Plan.
- The Governor has directed the Bioenergy Interagency Working Group, composed of nine individual state agencies, to carry out the Plan.
- The Governor signed Assembly Bill 32, the Global Warming Solutions Act of 2006, and subsequent Executive Order, establishing a Low Carbon Fuel Standard

Governor's Executive Order S-06-06 on Biomass

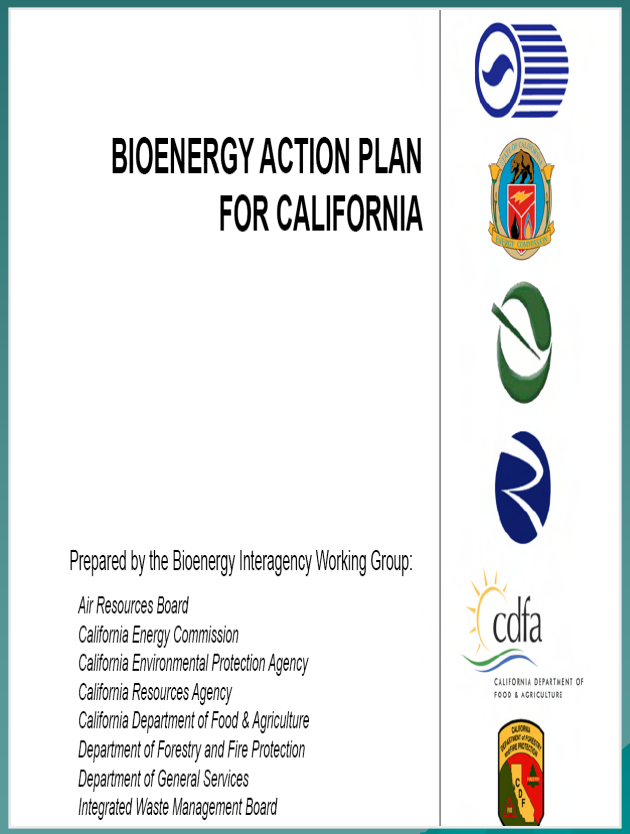
On April 25, 2006, the Governor signed an Executive Order, establishing targets to increase in-state production and use of bioenergy, including ethanol and bio-diesel fuels made from renewable resources:

- **For biofuels**, the state shall produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050.
- **For biomass for electricity**, the state meet a 20 percent target within the established state goals for renewable generation for 2010 and 2020.

Bioenergy Action Plan

In July 2006, the Governor publicly released the State of California's Bioenergy Action Plan in order to:

- **Coordinate research, development, demonstration, and commercialization efforts across federal and state agencies.**
- **Align existing state regulatory requirements to encourage production and use of California's biomass resources.**
- **Facilitate California as a market leader in technology innovation and market development**
- **Encourage market entry for new applications of bioenergy, including electricity, biogas, and biofuels.**
- **Maximize the contributions of bioenergy toward achieving multiple state policy goals of petroleum reduction, climate change, renewable energy, and environmental protection.**



California Biomass Roadmap

***Vision*: Sustainable biomass resources energize a healthy and prosperous California through the environmentally beneficial production and use of renewable energy, bio-fuels, and bio-products.**

Priority research areas:

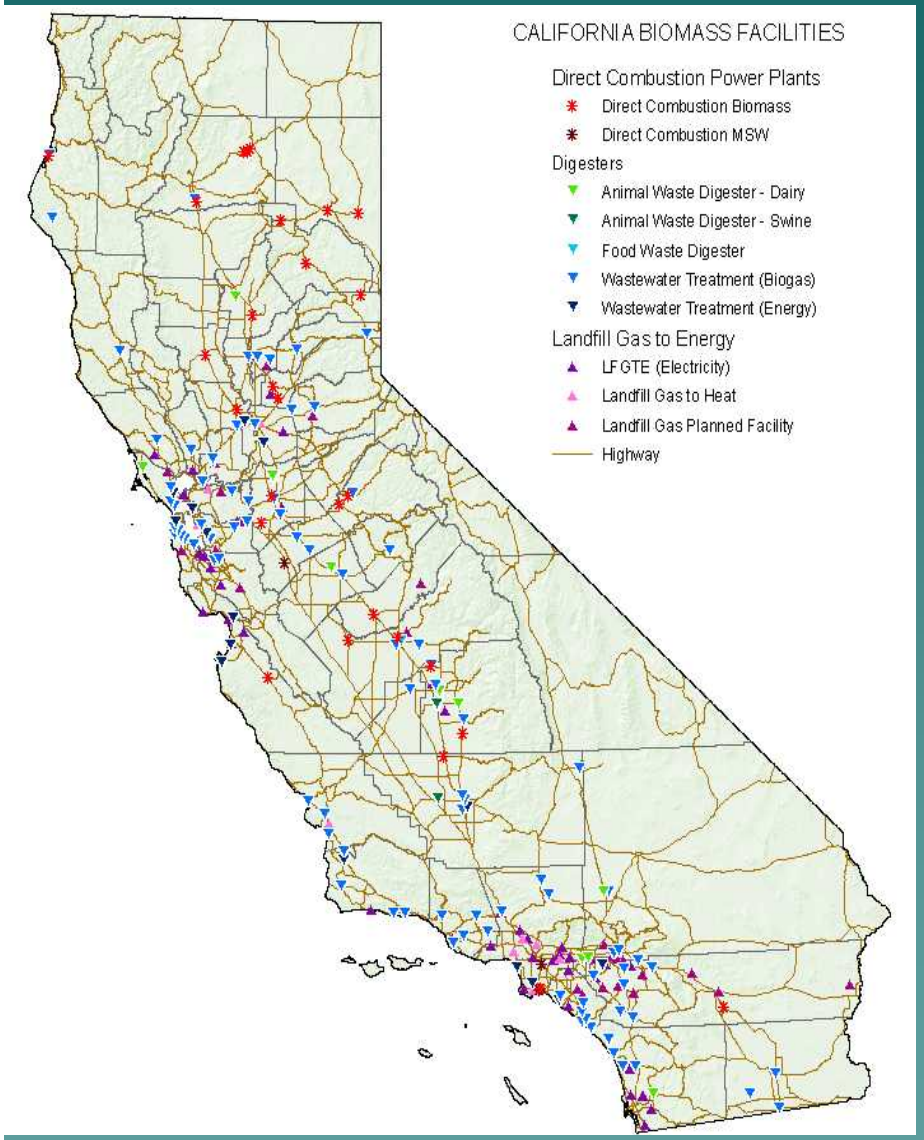
1. Resource access and feedstock markets and supply
2. Market expansion, access, and technology deployment
3. Research, development, and demonstration
4. Education, training, and outreach
5. Policy, regulations, and statutes

- CBC now developing a "draft Work Plan" to implement this Roadmap

California Bioenergy Status

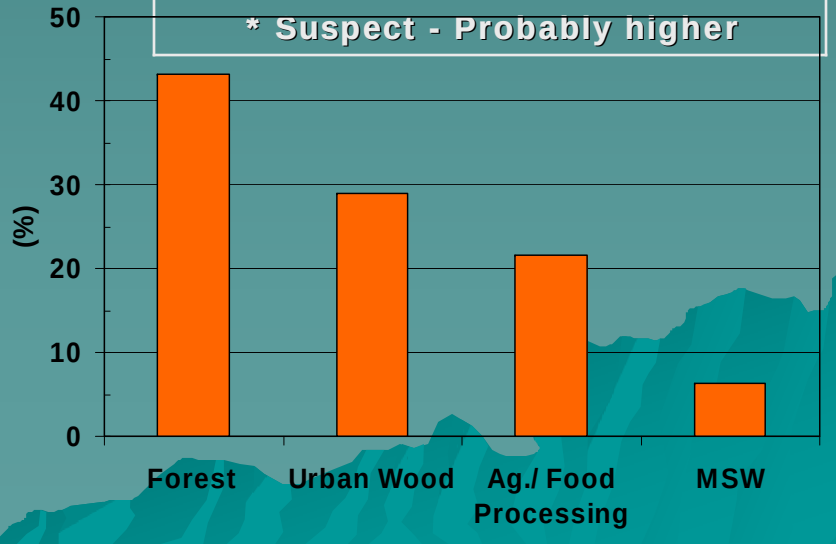
- Biomass power facilities produce
- ~ 600 MW of electrical capacity:
  - **Combustion of Forestry, Agricultural and Urban Residues for Power**
  - **Convert Methane Rich Landfill Gas to Energy**
  - **Construct Wastewater/ Dairy Biogas Systems that process Biogas.**
- Biofuels - Californians consumed over 900 million gallons of ethanol and over 43 million gallons of biodiesel in 2006

Current Production and Fuel Sources



Technology / Fuel Source	Number of facilities	Gross Capacity (MW)
Solid Fuel Combustion (includes 3 MSW facilities)	30	640
Landfill gas-to-energy	60	275
Wastewater treatment *	20	64
Animal and food waste digester	22	5.7
Totals	132	985

* Suspect - Probably higher



Ethanol Production in California

- Most of California's ethanol supply comes from the Midwest U.S. and is supplemented by ethanol imports from Brazil.
- California has two small, existing ethanol producers, who use food and beverage industry residues to produce less than 10 million gallons per year (1 percent of total demand).
- Several corn-to-ethanol plants are operating (producing 68 million gallons/year), and many more plants are in planning stages.
- Sugarcane-to-ethanol production is being actively explored in California's Imperial Valley.

California's Low Carbon Fuel Standard

On January 9, 2007, the Governor issued his Executive Order S-1-07, establishing the world's first Low Carbon Fuel Standard for transportation fuels.

- Under this proposal, petroleum refiners, gasoline seller and fuel suppliers must reduce the carbon content of their fuels by 10 percent by 2020.
- By regulating carbon fuel content, this standard will support the state's greenhouse gas reduction targets, while promoting the use of alternative fuels.
- Adding ethanol or other biofuels into gasoline is one option for meeting the Standard.
- The ARB will adopt this Standard as an "early action measure" as required by Assembly Bill 32 in late 2008.
- This has resulted in the ongoing effort with SB 210 to codify the low carbon fuel standard.

California State Policies Affecting Biofuels

- **Governor Schwarzenegger signed Executive Order S-06-06 in April 2006 on Biomass, directing state agencies to promote instate biofuels production and use.**
- **At the Governor's direction, the Bioenergy Working Group released its Bioenergy Action Plan for California in July 2006.**
- **The California Legislation directed the Energy Commission to prepare a State Alternative Fuels Plan by 2007 (to be submitted in September 2007.**
- **The signing of Assembly Bill 32 (the Global Warming Solutions Act) and California's Low Carbon Fuel Standard will stimulate second generation biofuels.**
- **SB 210 which establishes a Low Carbon Fuel Standard is enrolled and awaiting action by the Governor.**

Quick Review of Federal Actions

- 2007 Farm Bill - Provide $1.6 billion in new funding for renewable energy research, development and production, targeted for cellulosic ethanol, which will support $2.1 billion in guaranteed loans for cellulosic projects and includes $500 million for a bio-energy and bio-based product research initiative.

- 2007 Energy Bill – Extends existing tax credits for renewable energy including closed loop biomass for 4 years ($184 mil). Provides bond funding for public power producers including closed loop biomass ($563 mil).

- Supreme Court Decision that EPA has the authority and Should regulate GHG emissions – Enable California to continue implementation of AB 32.