Thank you for joining us! What brings you to this event?

To find out how this process is proposed to be used in EDC.

To be able to hold an intelligent conversation with fellow community members about the biomass process and .

I am working for the El Dorado County Office of Wildfire Preparedness and Resilience facilitating the advancement of biomass utilization projects within the county.

Looking forward to learning more about case studies and opportunities for sustainable GHG reductions.

General interest!

To find out more about biomass and possible applications within our GHG Offset Program

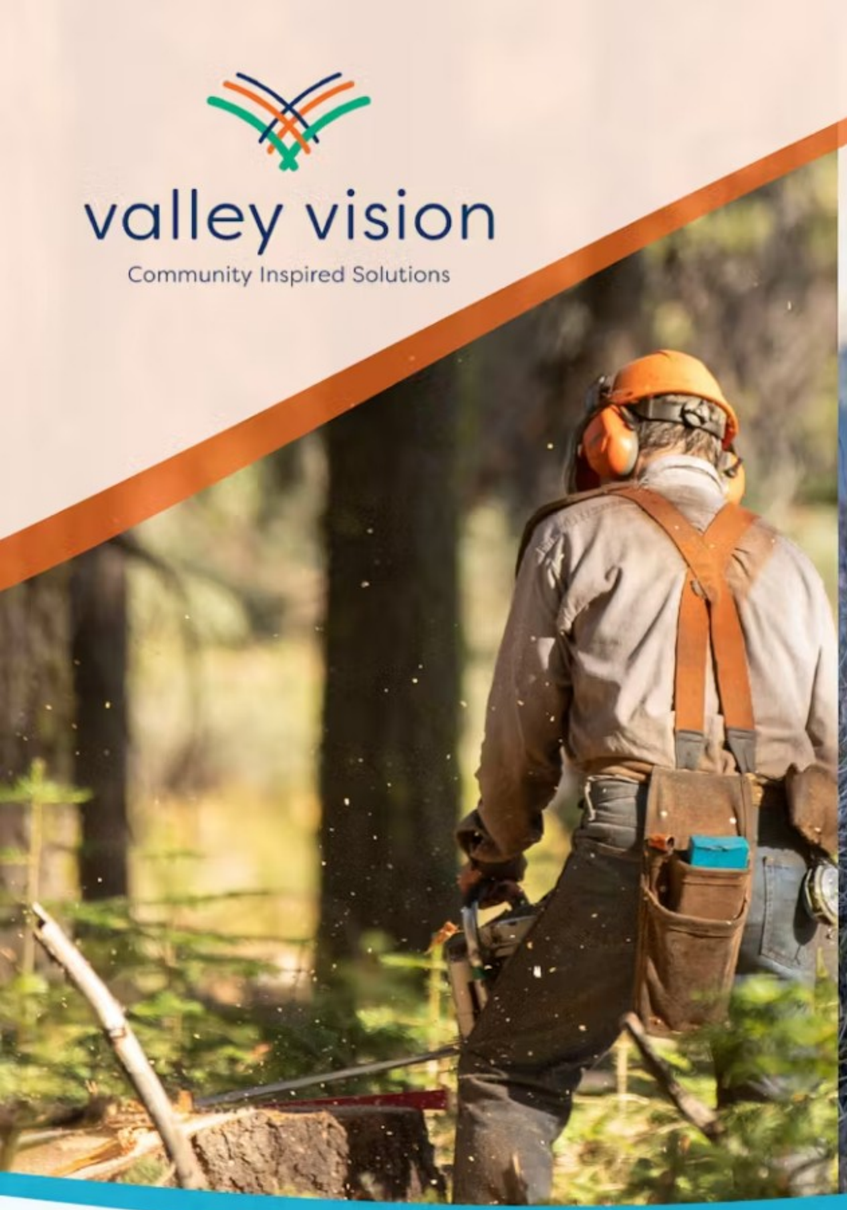
BEAM Circular is a local nonprofit transforming biomass waste into opportunity. It works to grow and attract businesses in the circular bioeconomy across the North San Joaquin

To learn about biomass use in CA

7

valley vision

Community Inspired Solutions



LOS RIOS COMMUNITY COLLEGE DISTRICT

Cleaner Air Partnership

CAPITAL REGION CLIMATE READINESS COLLABORATIVE

Biomass & Beyond: The Future of Our Forests and Working Lands

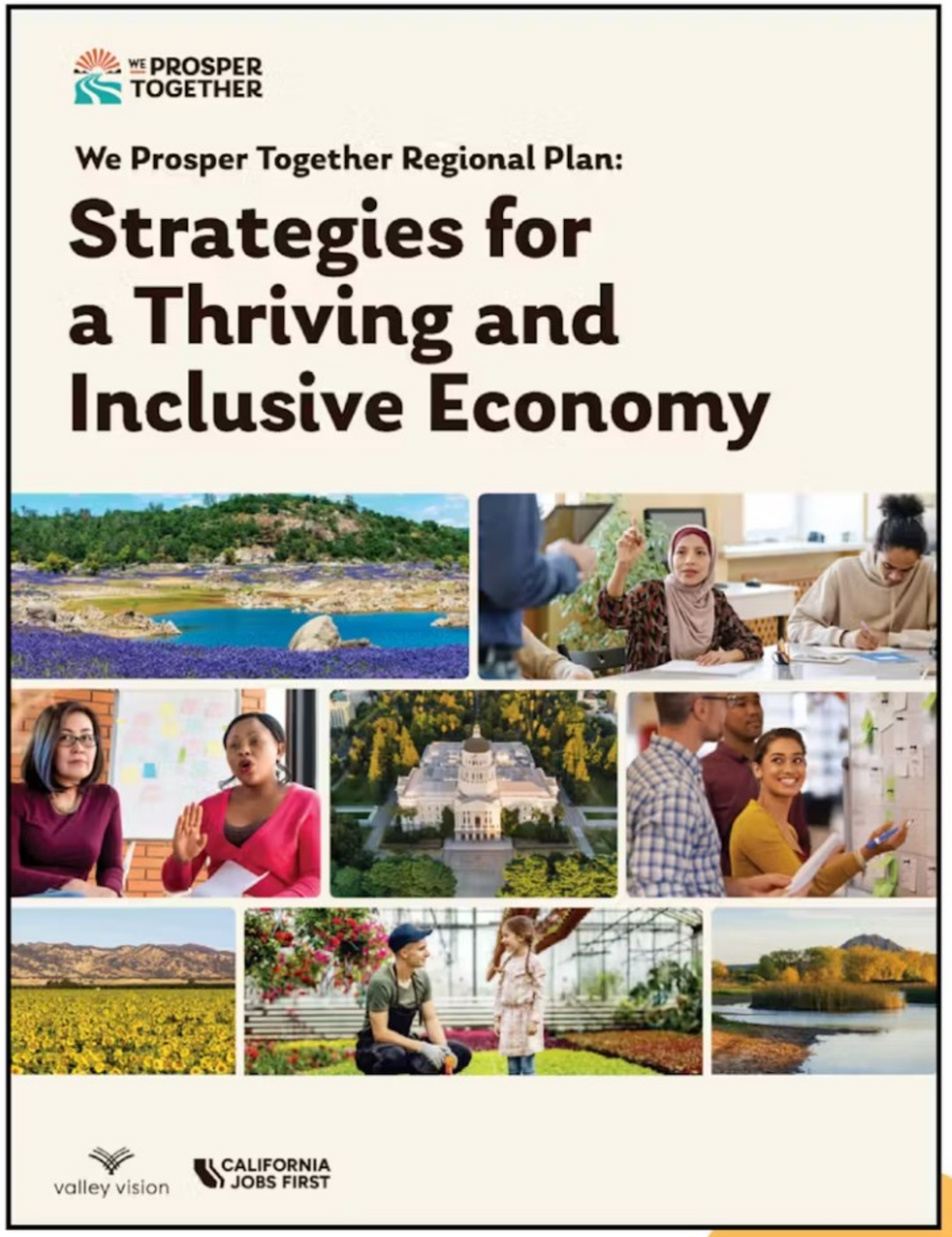
Welcome and Introduction

Caitlin Blockus, Project Manager
Valley Vision

Renee John, Managing Director
Valley Vision

We Prosper Together Regional Plan

www.tinyurl.com/WPT-plan



Thank you

to all of our supporters

Cleaner Air Partnership

LOS RIOS COMMUNITY COLLEGE DISTRICT

California Community Colleges

North Far North Regional Consortium

Capital Region Climate Readiness Collaborative

SETA

Workforce Development Board

Lake Tahoe Community College

C·O·E Centers of Excellence Inform Connect Advance

Yolo County, CA WIB

Woodland Community College

YCCD Yuba Community College District

Golden Sierra

Guest Speaker

Eric Guerra
California Air Resources Board

Biomass 101

Martin Twer
The Watershed Center

Biomass & Beyond:
The Future of Our Forests and Working Lands

Biomass 101

“If you can't grow it, you have to mine it”

Martin Twer
Biomass Program Director

THE WATERSHED CENTER
HAYFORK, CALIFORNIA

Why Biomass Utilization?

Biomass—Renewable Energy from Plants and Animals

Biomass is renewable organic material that comes from plants and animals. Biomass can be burned directly for heat or converted to liquid and gaseous fuels through various processes.

U.S. Energy Information Administration

Role in the circular economy

Biomass is becoming a pillar of the circular economy because it allows us to use what was once considered waste as a renewable energy resource.

"If you can't grow it, you have to mine it"

Sources of Biomass

- Trees
- Energy crops (woody; crops like corn, sugarcane, rapeseed, purpose-grown grasses, etc.)
- Agricultural wastes (manures, dairy waste, rice and corn stalks, etc.)
- Algae
- Landfill waste

Sources of Biomass

“Dry” / lignocellulosic materials

→ thermal, thermochemical conversion (combustion, gasification)

- Trees
- Energy crops (woody, e.g. willows)
- Purpose-grown grasses (e.g. switchgrass)

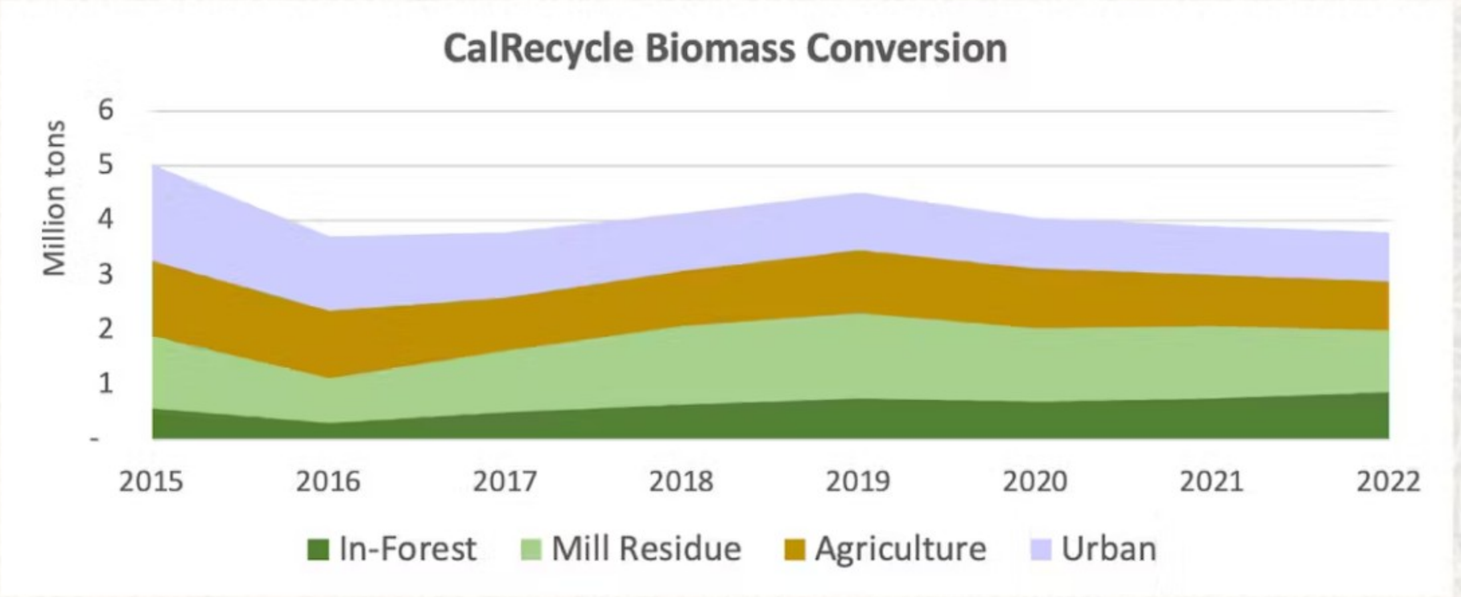
Landfill waste

“Wet”

→ biochemical conversion (anaerobic digestion)

- Agricultural wastes (e.g. manures, dairy)
- Algae
- Energy crops (corn, sugarcane, rapeseed, etc.)

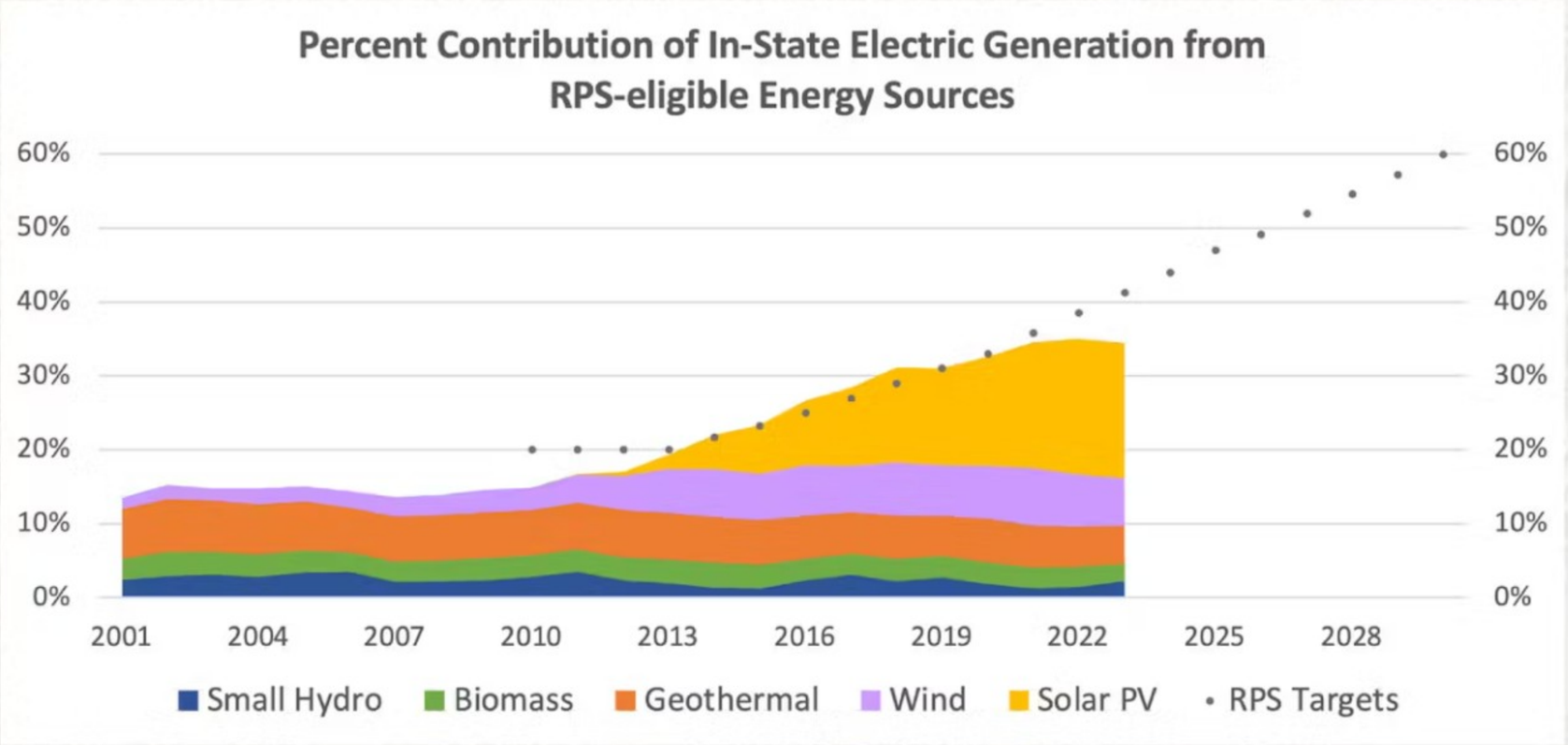
Sources of Biomass



Biomass Products, Uses, and Market Streams

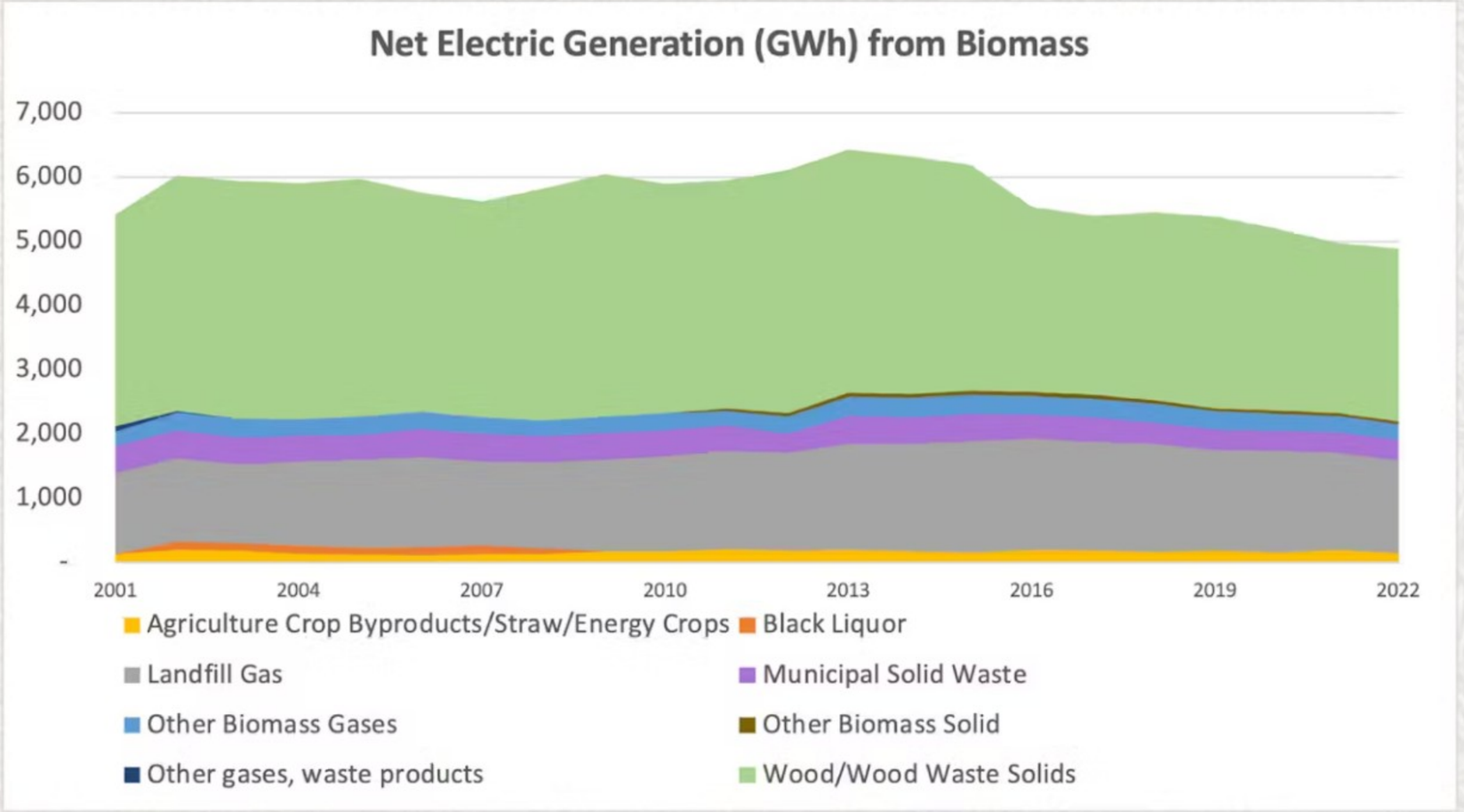
- Electricity generation
- Heating / Cooling
- Renewable natural gas
- Transportation fuels
- Hydrogen production

Biomass Products, Uses, and Market Streams



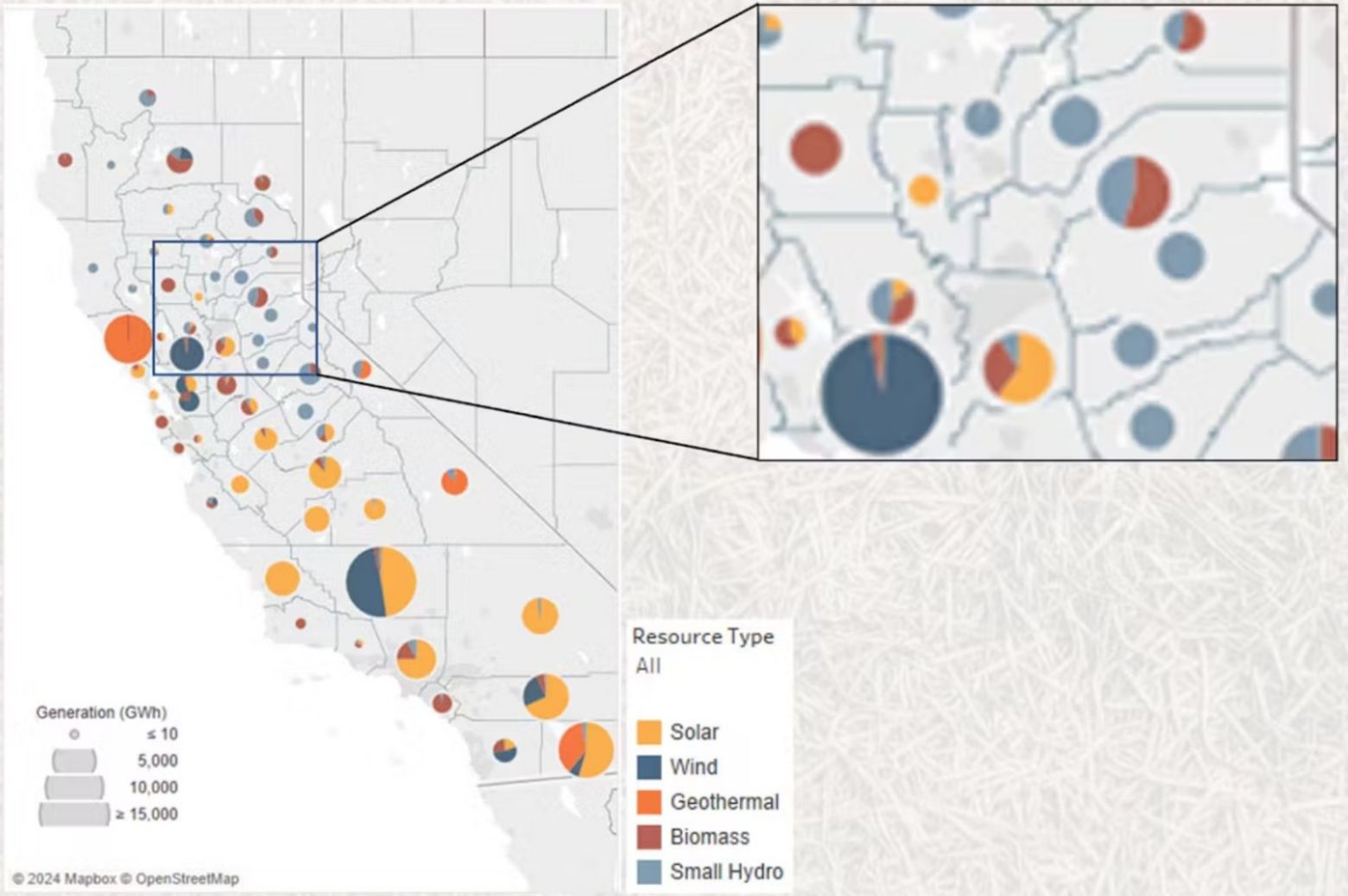
California Energy Commission, Energy Almanac

Biomass Products, Uses, and Market Streams



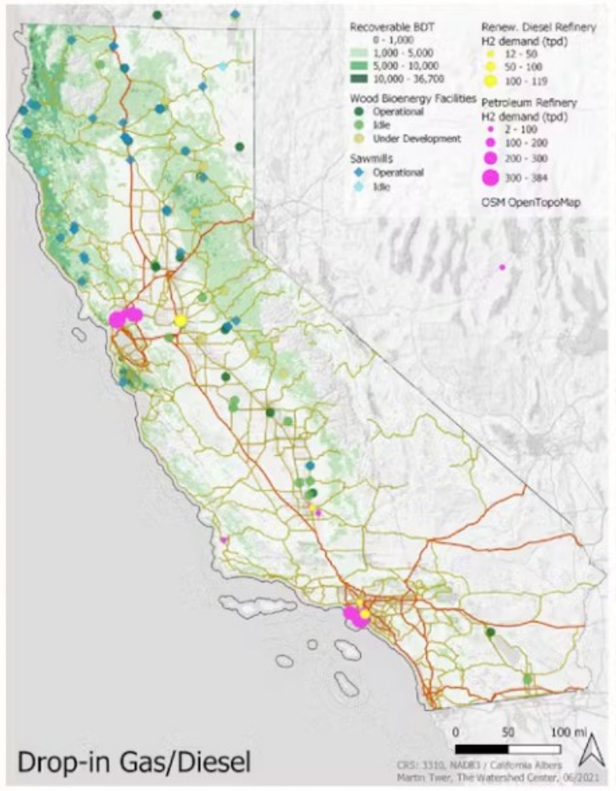
California Energy Commission, Energy Almanac

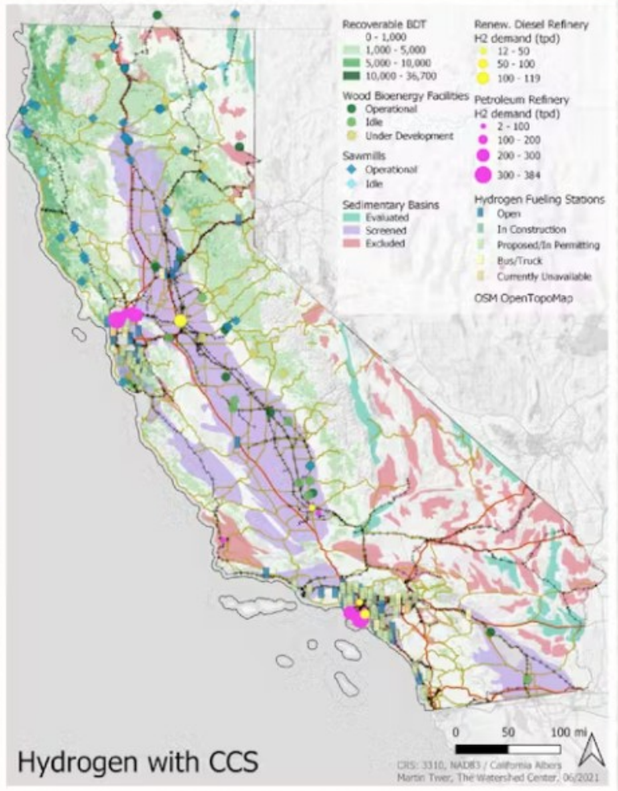
Biomass Products, Uses, and Market Streams

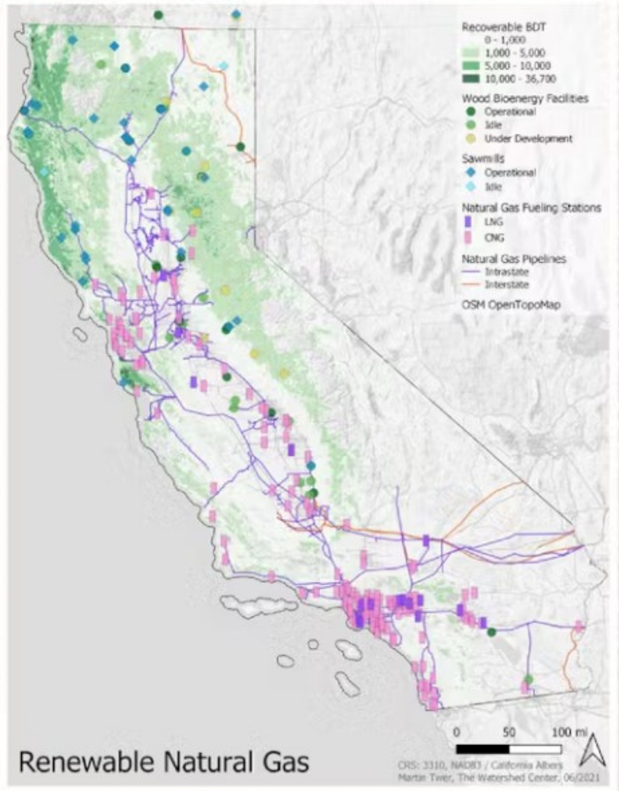


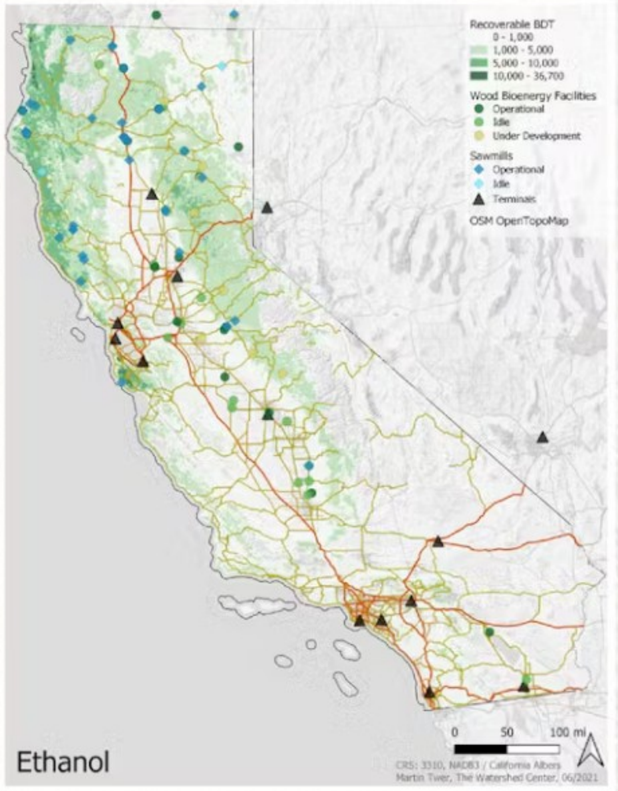
2020 RPS-certified renewables map. Data source: California Energy Commission 2023.

Biomass Products, Uses, and Market Streams



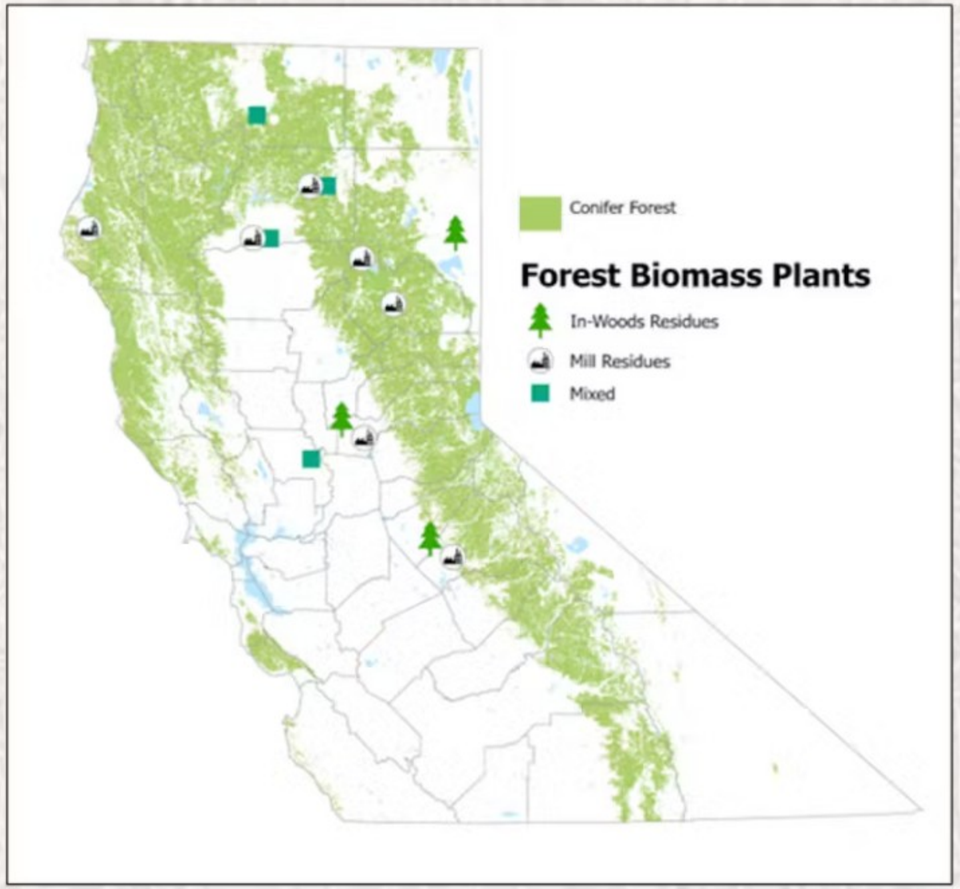






Sanchez, D.; Gilani, H. 2021. Advancing collaborative action on forest biofuels in California. Joint Institute for Wood Products Innovation. Sacramento, CA: UC Berkeley, Board of Forestry.

Biomass Products, Uses, and Market Streams

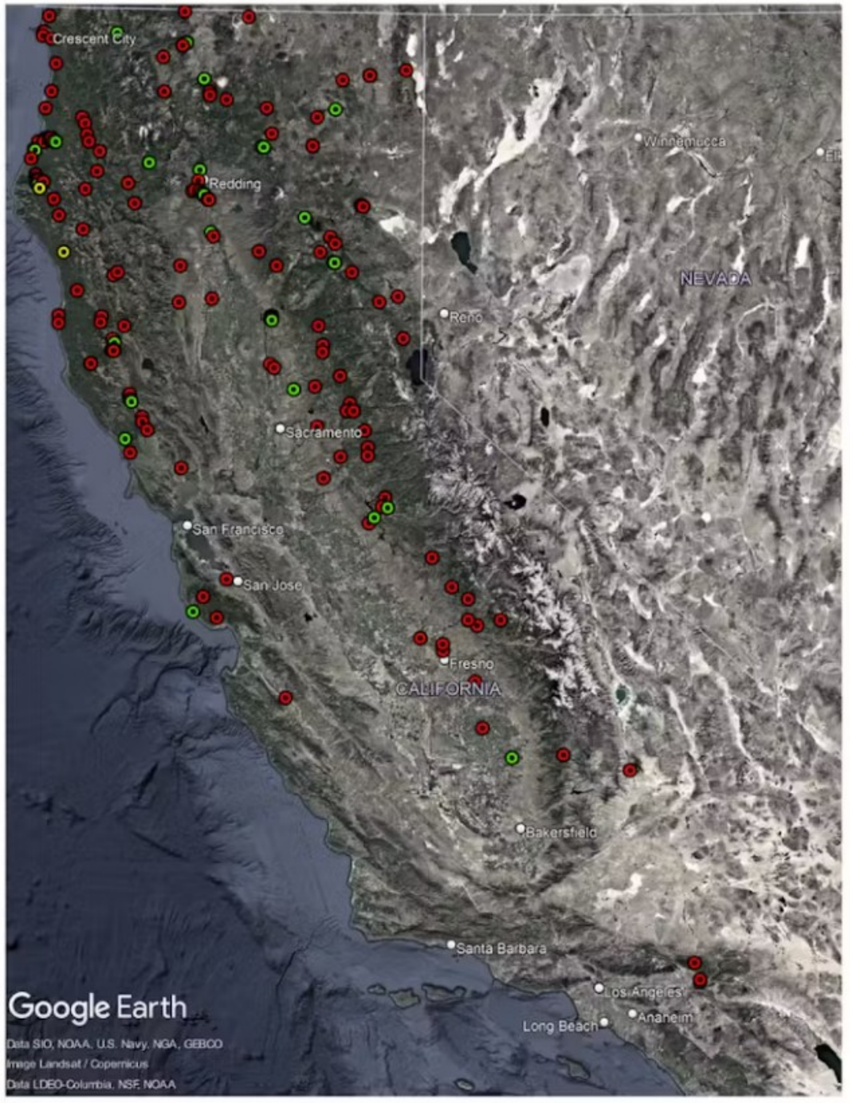


Forest biomass energy facilities. Includes biomass energy and co-generation plants that produce electricity primarily from in-forest residues and/or mill residues.

Opportunities & Challenges for Biomass Utilization

- Continue to support research to fully account for and better quantify (both physically and economically) both the positive and negative aspects of energy production from (forest) biomass, compared to the alternative fate of the waste biomass, including feasibilities and impacts.
- Continue to develop and support policies that recognize the potential of (forest) biomass energy projects to improve forest health, reduce wildfire threat, contribute to rural economies, and provide other benefits.
- Quantify emissions (air and climate pollutants) from open burning and wildfires and incorporate the value of avoided emissions into cost-benefit analyses of biomass energy.
- Consider a biochar protocol to recognize the carbon value of biochar production and use.
- Develop a strategy to convert forest waste biomass to hydrogen and Sustainable Aviation Fuel.
- Continue to explore opportunities for forest biomass to contribute towards the state's Low Carbon Fuel Standard Program.
- Increase the requirement for firm, renewable power or create separate price tracks for firm renewables and intermittent renewables to recognize the different grid benefits they provide and the fact that firm renewables don't require backup generation or energy storage.
- Consider requiring ceramic catalytic air filters on all combustion facilities, or all facilities in extreme non-attainment districts.

Opportunities & Challenges for Biomass Utilization



Opportunities & Challenges for Biomass Utilization

Biomass & Beyond:
The Future of our Forests and Working Lands

"If you can't grow it, you have to mine it"

Thank you.

Martin Twer
Biomass Program Director
martin@thewatershedcenter.com

THE WATERSHED CENTER
HAYFORK, CALIFORNIA

Facilitated / Audience Q&A

Erik White
Placer County Air Pollution Control District

What opportunities do you see for biomass in the region?

Pyrolysis

Fuels

Building materials

Reduce open agricultural burning

Disbursed small diameter timber mills

Building materials

Ag chemicals

Farm biomass and carbon sequestration/avoided emissions.

1

34

What opportunities do you see for biomass in the region?

Jobs

Huge opportunities to big cluster sites and take advantage of emerging markets.

Biochar

Biomass to Hydrogen is my main interest as a person who works with Fuel Cells

Pellet production

Cross laminated Timber

Trade able Sector for Rural Communities - Manufacturing / Bioeconomy

Biochar

1

34

What opportunities do you see for biomass in the region?

Biochar

Jobs and innovation through education-public partnerships in engineering and agriculture

Retrofitting current fleet of large plants to be "cleaner."

How do we increase the pace of development of all the technologies?

Continued operation of existing biomass to energy facilities until technology is adopted and grown to the scale needed.

Small sawmills

Backstopping "commitment" with action

I believe it is with the gasification/pyrolysis technology.

1

34

What opportunities do you see for biomass in the region?

Pyrolysis for biochar for carbon sequestration and also helps for construction materials

Regular timber

We have a lot of emissions data - we need a cost benefit analysis done with that data

Proximity to ports: decarbonizing port transportation

improing air quility from smoke and local energy production

Workforce development and job sector growth

Need an investment fund

Rebuilding communities that were devastated by the loss of the logging/lumber industry and cleaning up

1

34

What opportunities do you see for biomass in the region?

Reuse through forms of art and furniture

Multiple community scale facilities locate close to the source of material.

Forest biomass into biochar (soil amendments);Forest biomass into alternatives to sphagnum moss (from Canada) for nursery planting / horticulture.

Taking flamable woody biomass, that will likely burn anyways, and turning it into an economic opportunity for local communities.

Building resilient forests

Small dimension lumber

CA is positioned to prepare this emerging workforce through the community colleges

Workforce training

1

34

What opportunities do you see for biomass in the region?

Bioeconomy Development Opportunity Zones (BDOZ) to market areas seeking biomass facilities

Improving air quality in rural communities that burn ag material.

Hydrogen production while addressing ag and forest "waste"

Increased energy needs in california will drive converting biomass to fuels.

Bioresources to electricity or H2 for grid reliability

Economic opps for rural communities with investment

Diversification of biomass products derived from forest residues beyond electricity generation

Ramping up use of biomass utilization of forest fuels to reduce fire danger.

What opportunities do you see for biomass in the region?

Value the ecosystem services of a healthy forest after thinning

1

34

Enjoy your Lunch!

12:00 - 12:30 PM

valley vision
Community Inspired Solutions

LOS RIOS COMMUNITY COLLEGE DISTRICT

Cleaner Air Partnership

CAPITAL REGION CLIMATE READINESS COLLABORATIVE

Biomass & Beyond: The Future of Our Forests and Working Lands

Case Studies Panel

Gloriamar Gamez
BEAM Circular

Kerri Timmer
Placer County

Elizabeth Bentancourt
California
Department of Conservation

BEAM CIRCULAR

BIOECONOMY • AGRICULTURE • MANUFACTURING

Transforming waste into community prosperity and a healthy environment for all

BIO ECO NOMY

MANU FACTU RING

AGRI CUL TURE

BioEconomy, Agriculture, & Manufacturing (BEAM) Initiative:

a regional strategy for global leadership in the circular bioeconomy

BEAM Portfolio

Public-private programs and investments that enable growth of the circular bioeconomy, create jobs, and support a healthy environment

- Community & Collaboration
- Enabling Infrastructure
- Workforce Development
- Innovation
- Access to Capital

Case Study: $55+ million in public and private capital mobilized for BEAM portfolio since launch Jan 2023

- $10 million investment from Stanislaus County
- $3.6 million Economic Development Pilot Grant (CA Jobs First)
- $1 million National Science Foundation Engines Development Award
- $1.5+ million in early private/philanthropic grants to BEAM Circular
- $9.7 million award from Schmidt Sciences & FFAR

$25.8M grants

local gov. | state | federal | industry | philanthropy

$30 million in venture capital committed by HawkTower to support circular bioeconomy startups in the North San Joaquin Valley over the next decade.

CBIO Collaborative - Diverse Partner Network

BIOTECHNOLOGIES FACE BARRIERS TO SCALE

Research & Development

Micro Scale
< 1 mL, HT
"Test Tube Scale"

Bench Scale
100 mL – 20 L
"Cup/Gallon Scale"

Scale-Up

Pilot Scale
50 L – 1000 L
"Bathtub Scale"

Manufacturing

Demo Scale
10 m^3 – 50 m^3
"Swimming Pool Scale"

Commercial Scale
100 m^3 +
"Large Grain Silo Scale"

BEAM Focus: Industry Gap / Valley of Death

R&D has outpaced commercialization and biomanufacturing scale-up. Gaps include a lack of key pilot/demo-scale manufacturing infrastructure, as well as policy and economic solutions that help bridge the "valley of death".

Policy Enablers

1. Regional & State Sector Prioritization of Circular Bioeconomy
2. Address Regulatory Complexity and Permitting Delays
3. Nurture End-Markets for Bio-Based Products
4. Support Financing for Circular Bioeconomy Projects and Supply Chain Infrastructure
5. Align State Carbon Reduction Programs
6. Insufficient Workforce Development and Training
7. Support Data and Measurement

BEAM CIRCULAR

BIOECONOMY • AGRICULTURE • MANUFACTURING

Let’s collaborate!

www.beamcircular.org

Biomass & Beyond: The Future of Our Forests and Working Lands

COUNTY OF Placer

PCW

Taking the Next Steps – Cal FRAME Project Need

- **Urgency**
  - More projects → more material
  - Limited local biomass outlets → more pile burning; more fuel left in the forest; more severe fires
- **Challenges for Biomass Facilities**
  - Inconsistent and risky biomass supply chain
  - Limited capital access for market expansion

County of Placer

PCWA

Addressing Supply Chain Risks

- **TCS Cal FRAME Pilot**
  - Leads: PCWA & Placer County
  - Goals: Improve feedstock logistics and reduce risk through aggregation

- **Project Scope:**
  - Engage stakeholders to understand challenges and opportunities
  - Conduct feasibility study for planned facility at Ophir Road
  - Assess roles of water agencies in forest health & biomass
  - Explore legal entities for long-term contracting

COUNTY OF Placer

PCWA

Key Findings & Proposed Models

- **Regional Interest:** Strong support for a biomass aggregation entity
  - Need for a flexible, fast-acting structure
  - Desire for additional services → environmental review, grants, and residential greenwaste management
- **Water Agencies:** Critical for forest health and wildfire resilience
- **Biomass Potential:** 100,000+ BDT/yr currently; up to 320,000 BDT/yr possible in future
- **Evaluated JPA Models:** Watershed Authority, State Agency, Three-County, Wildfire Prevention Authority.

County of Placer

PCWA

Hub Implementation Strategy

- **Phased Approach:**
  - Start with informal JPA (Agreement) for member agencies to confirm key functions and develop strategic plans
  - Consider a separate legal JPA (Authority) for broader services
- **Funding:**
  - Initial: Member contributions
  - Future: Grants and service fees if legal JPA entity formed
- **Next Steps:**
  - Local government outreach in early 2025
  - Develop a Contract Guarantee Fund & pricing mechanisms
  - Collaborate on BDO Zone Rating to attract investment

COUNTY OF Placer

PCWA

Questions?

County of Placer

PCWA

California
Department of Conservation

State Biomass Utilization to Energy: Policy Opportunities and Needs

Biomass and Beyond, November 20, 2024

Elizabeth Betancourt

Natural and Working Lands Policy Advisor

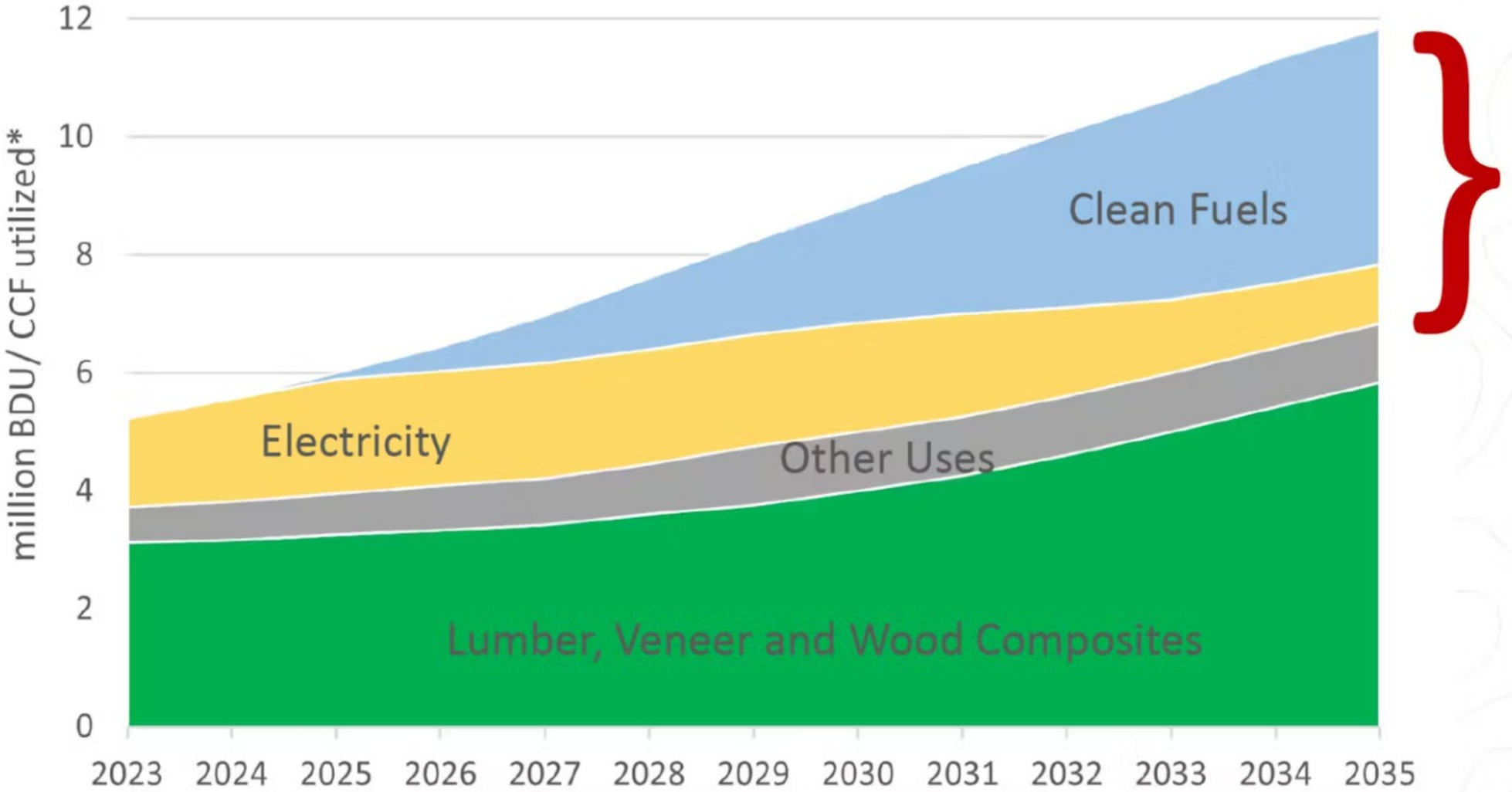
State Co-Chair, Wood Utilization Work Group

We create value from forest biomass to support a greater number of acres treated

The objective of this work is **forest health**

Biomass Utilization Pathways

California
Department of Conservation



California Bioenergy Policies & Plans

California Department of Conservation

- Existing:
  - BioMAT and BioRAM: electricity procurement mandates (CPUC)
  - SB 1440: biomethane procurement mandate (CPUC)
  - Clean fleet mandate (CARB)
  - Low Carbon Fuel Standard (LCFS) incentive program (CARB)
    - Now supporting woody biomass-sourced fuels!
- Planning:
  - Scoping Plan (CARB):

  - Comprehensive report on H2 (SB 1075, CARB)
  - ARCHES hydrogen hub – DOE award
  - Draft Wood Utilization Strategy (Wildfire and Forest Resilience Task Force)

Needs: Policies and Partnerships

- Definitions, regulations, and authorities
  - Biomethane
  - Hydrogen
  - CEQA streamlining
- Procurement mandates
  - BioMAT extension
- Local government leadership
  - Yuba County Water Agency ($)
  - Placer County Water Agency (policy)
  - Placer APCD (policy)
  - Stanislaus County ($)
  - S2J2 Jobs First region ($, policy)

- Innovative partnerships and Tribal leadership
- Local-county-regional-State-federal partnerships and communication
  - Fact-based
  - All levels
- Public infrastructure investments:
  - Gas pipelines – biogas and CO2
  - Grid expansion/resilience where energy is produced

California
Department of Conservation

Thank you for your partnership!

Elizabeth Betancourt

Elizabeth.Betancourt@Conservation.CA.gov

916-767-8117

Facilitated / Audience Q&A

Lindsey Nitta
We Prosper Together Leadership Council Member

What ideas do you have to advance sustainable biomass utilization in our region?

We need reliable, reasonably priced capital

Distributed, mobile utilization hardware and permitting and regulatory flexibility to interconnect with existing infrastructure

Develop and maintain informational/distribution clearinghouse for the changing supplies and locations of agricultural biomass.

Are there examples of small scale efforts to bring the equipment necessary to process biomass materials in targeted forest areas?

Work with tribes who have successfully managed the forests much longer and more successfully than we.

Require USDA Forest Service to match forest yields to growth.

Connect with Burnbot at https://burnbot.com/ to learn about safe burning without smoke

7

Industry Panel

Facilitator: Hilary Tellesen, Workforce Director
Valley Vision

Chris Quijano
Rio Bravo-Rocklin

Justin Britton
CAL FIRE

Kerri Timmer
Placer County

Summary and Next Steps

Adrian Rehn, Senior Project Manager
Valley Vision

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Gretchen James - gretchen.james@valleyvision.org

valley vision
Community Inspired Solutions

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Help shape future events by completing this post-event survey!

SCAN BELOW