Biomass Happens: Can we safely and cost-effectively sequester the carbon?

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- **Elizabeth Betancourt** - Natural and Working Lands Policy Advisor, California Department of Conservation
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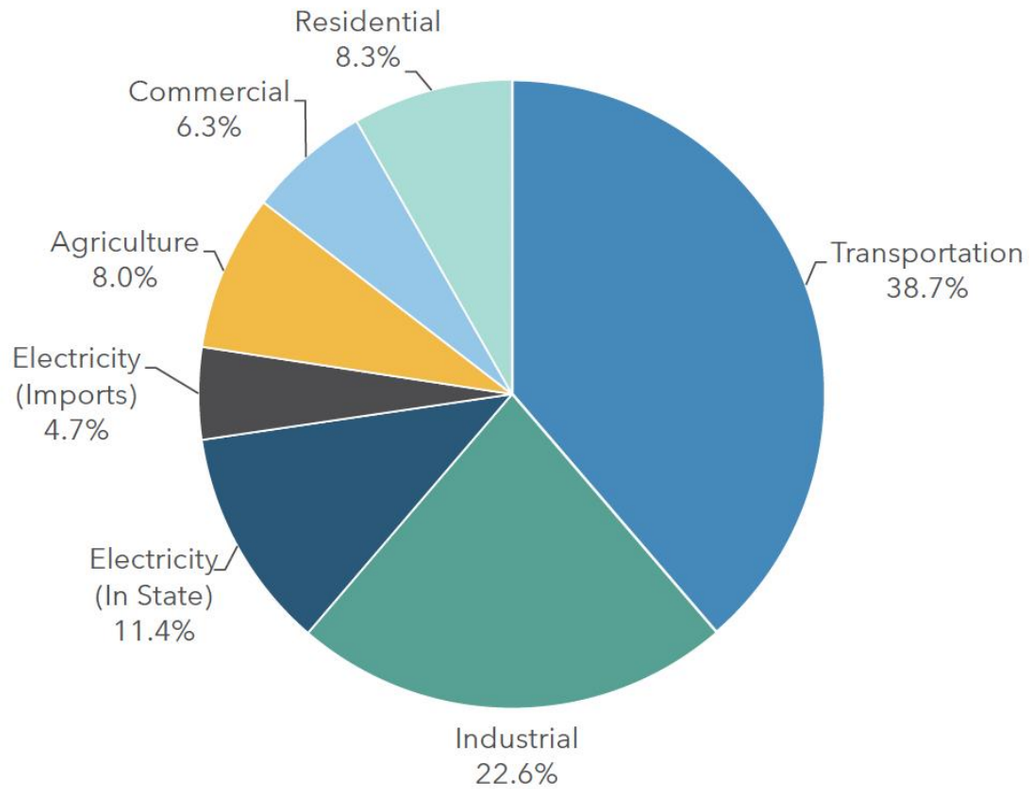
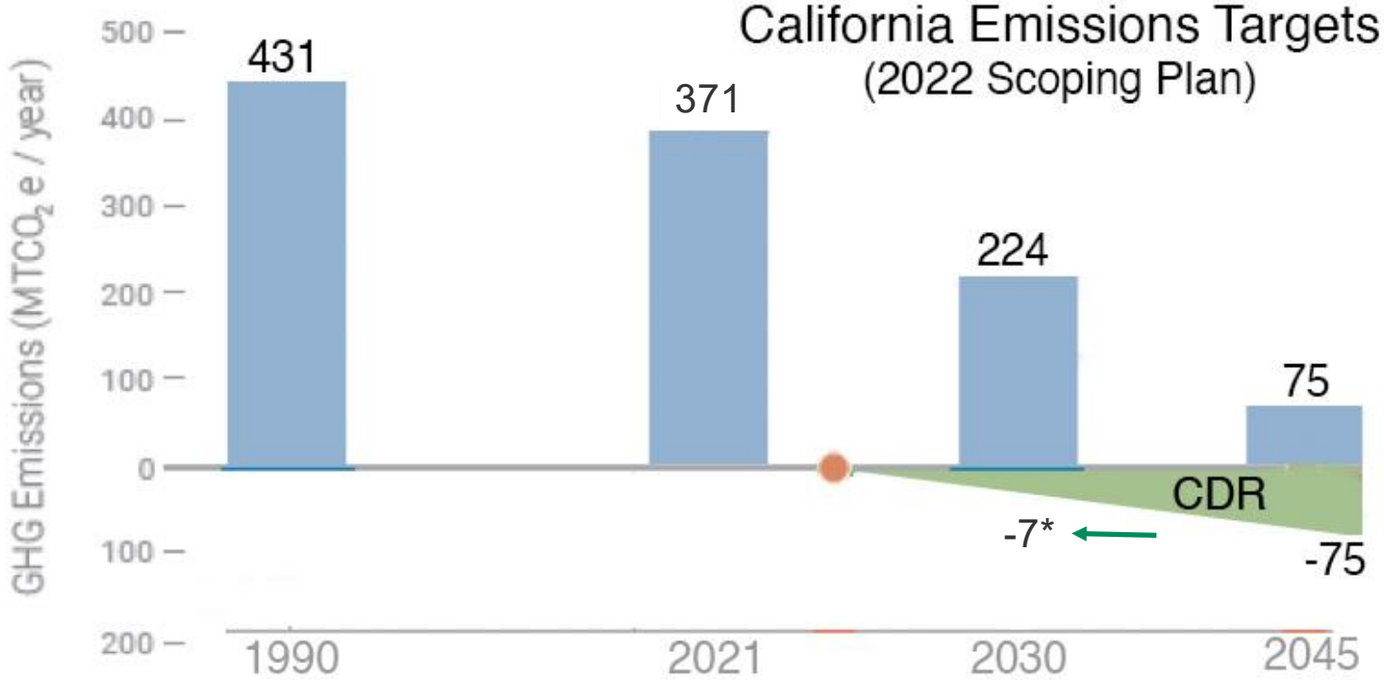
2022 GHG Inventory & Scoping Plan

- California Scoping Plan - Two Objectives
  - Reduce Emissions as Fast as Possible
  - Permanently Remove CO_2 from Atmosphere to Meet Net-Zero Targets



2022 GHG Inventory



*Includes 1M working lands sequestration

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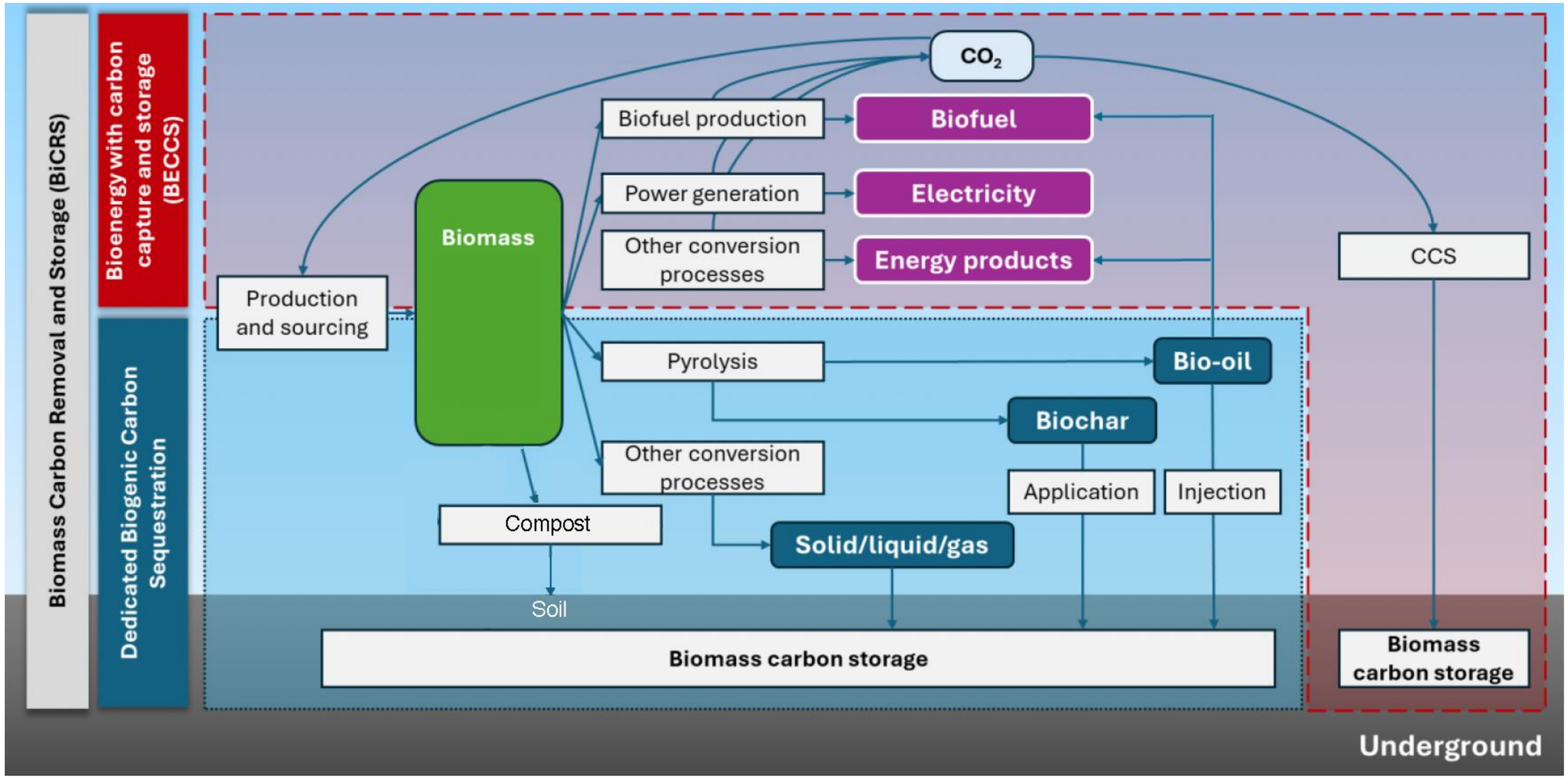
Biomass Happens

- For this panel, we are considering only the waste biomass from
  - Forest treatments needed to restore the health of the forest
  - Agriculture
- The biomass residue holds CO_2 that came from the atmosphere
- Potential Benefits:
  - Sequester the CO_2 - without material adverse impacts to air, water, land, etc.
  - Community benefits
  - Economically viable at scale
  - Avoid the status quo i.e. combustion, decomposition, etc.

Conversion Pathways with Carbon Sequestration



Source: "Best Practices for Life Cycle Assessment (LCA) of Biomass Carbon Removal and Storage (BiCRS) Technologies"
U.S. DOE, January 2025

How Gasification/Pyrolysis Is Different Than Uncontrolled Incineration

Incineration

Objective: Heat

Inputs:

- Dry biomass
- Air/Oxygen
- Heat/spark

Outputs:

- Heat
- Criteria pollutants
- Ash/smoke
- CO_2

Gasification/Pyrolysis

Objective: Gases/Carbon solids/liquids

Inputs:

- Biomass
- Sealed environment/limited oxygen
- Heat, Steam, Catalyst

Outputs:

- Captured synthetic gases: Hydrogen, CO_2, etc.
- CO_2 in liquid or solid form
- Soil amendment products
- Potential criteria pollution/toxics

This Panel Will Discuss

- What can go right?
  - Scale of waste biomass and potential sequestration
  - Status quo fixed - what currently happens with biomass
  - Co-benefits
- Policies
  - What exists that enables conversion?
  - What is missing?
- What can go wrong and what guardrails exist or are needed
  - Is it really residue/waste biomass?
  - Protection of communities, air quality, water
- Why haven’t projects happened already?
- How to build trust between communities and projects?

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