Biomass in north coast Community Choice Aggregation

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UC Berkeley Center for Forestry
Wood Resources Group
http://ucanr.edu/sites/WoodyBiomass/

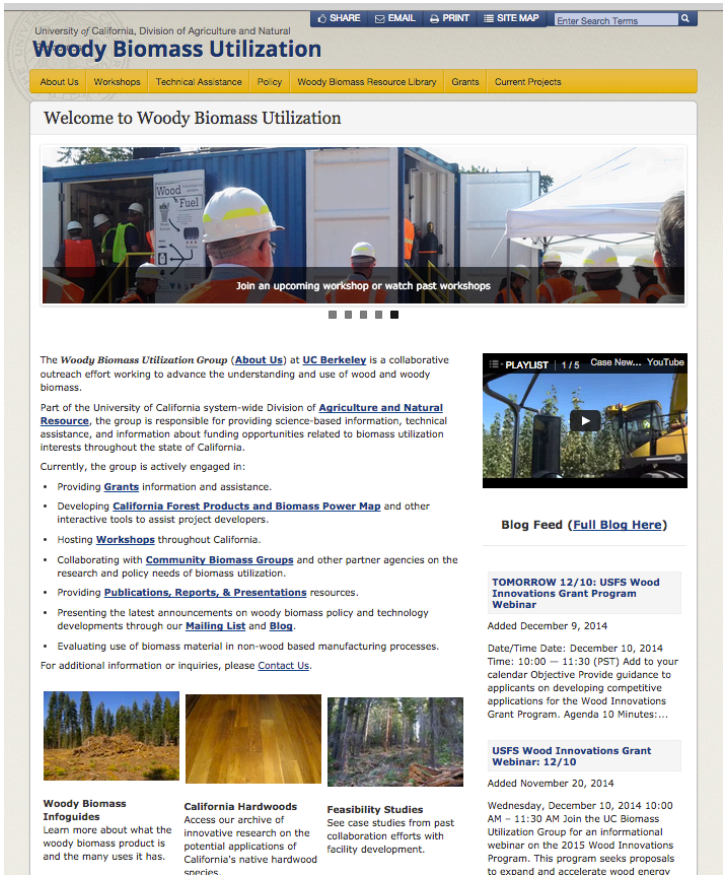
May 17, 2016

Outline

UC Wood Resources Group

- Public Outreach and Education
  - Workshops
  - Extension publications
- Technical assistance
  - Project development
  - Grant proposal development
- Staff/Faculty
  - John Shelly (*Emeritus*)
  - Peter Tittmann
  - Rick Satomi
  - Sahar Mohammadi

`http://ucanr.edu/sites/WoodyBiomass/`



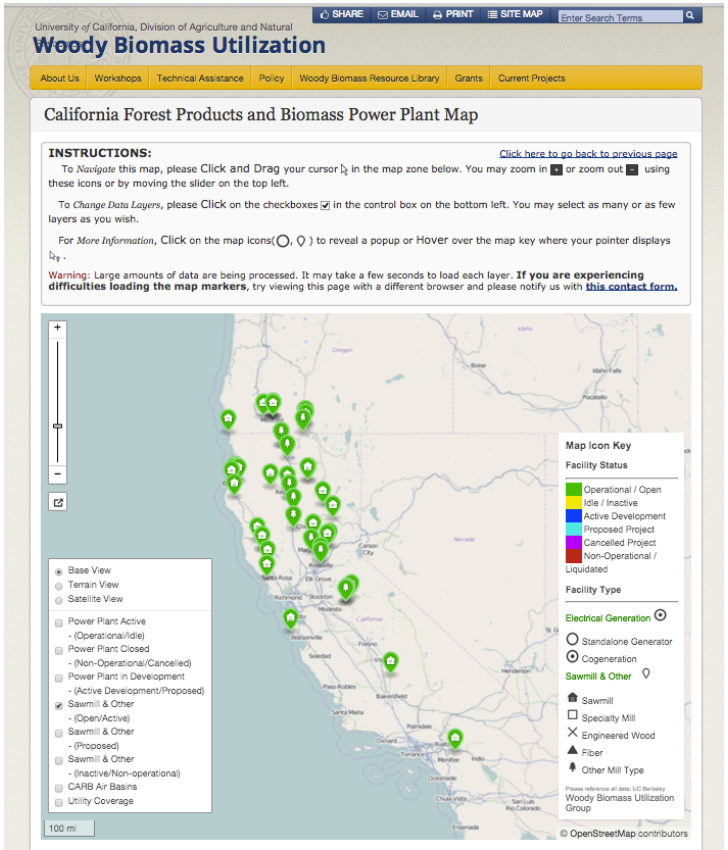
Industry infrastructure data

UC Wood Resources Group

maintains a web map and publicly accessible database of:

- Biomass power plants
  - Status: Inactive, Idle, Operational, Planned (projects)
  - Size
- Primary wood processing facilities 1970 – 2013
  - Production/shift
  - Closed/open

Website



Yesterday on the CAISO grid...

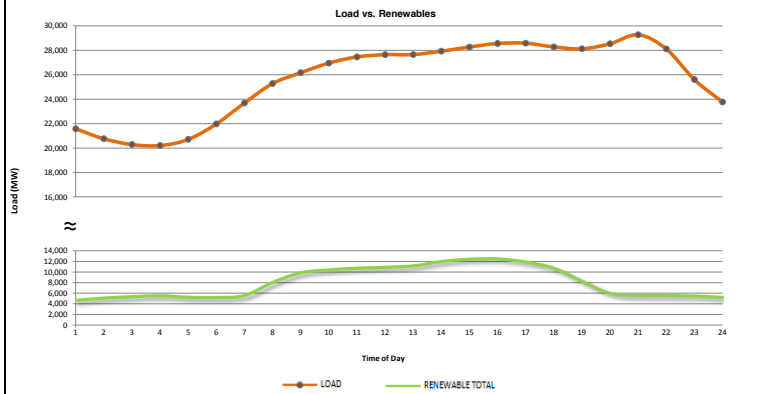
Renewables Watch

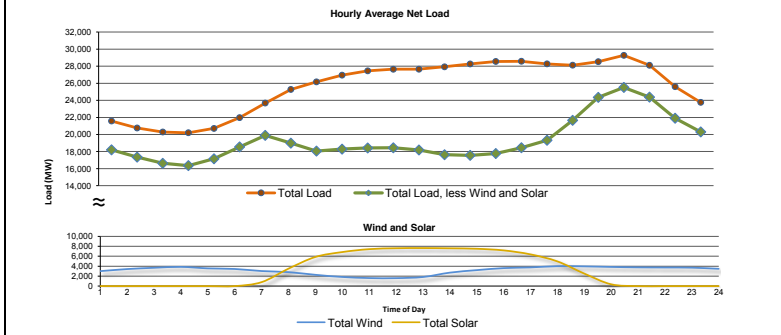
California ISO

For Operating Day:

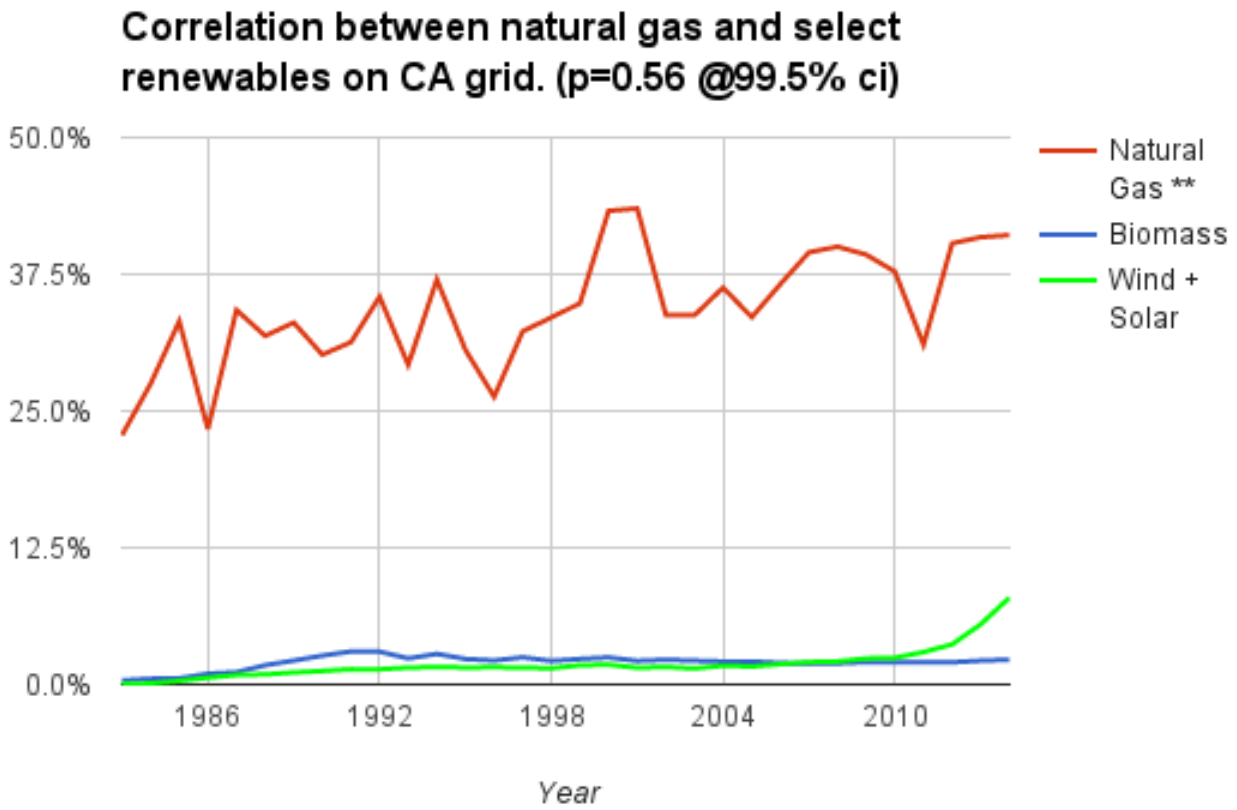
The first graph provided on this page shows how much energy renewable resources are contributing to the grid, and when those resources are producing their daily maximum and how that production correlates to the maximum energy demand.

Comparison to Load

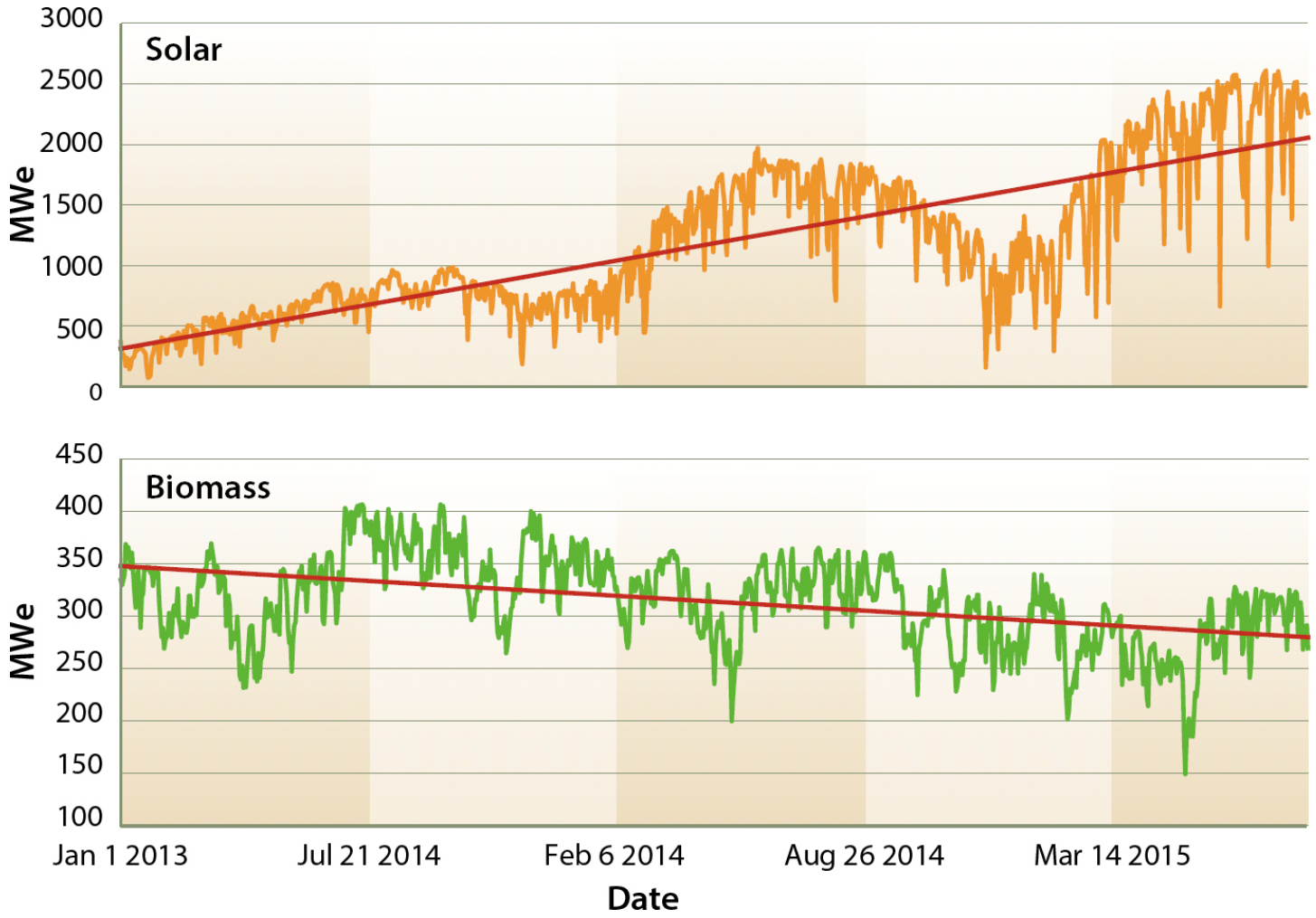




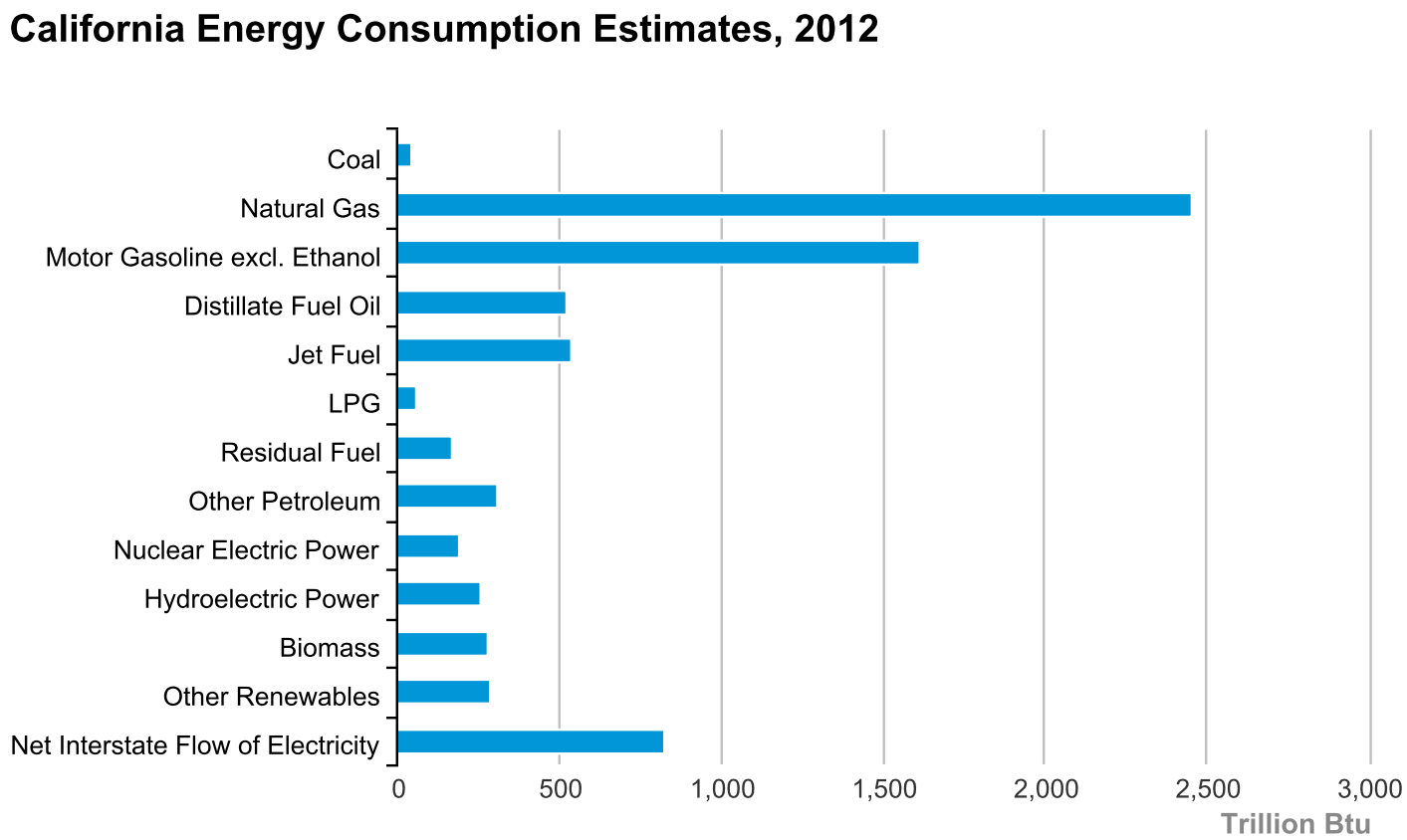
CA Energy consumption over time



Biomass decline with solar increase.



Aggregate energy consumption in CA



eia Source: Energy Information Administration, State Energy Data System

Biomass is dispachable

Renewables Watch

California ISO

For Operating Day: **Monday, May 16, 2016**

The Renewables Watch provides important information about actual renewable production within the ISO grid as California movestoward a 33 percent renewable generation portfolio. The information provided is as accurate as can be delivered in a daily format. It is unverifed raw data and is not intended to be used as the basis for operational or financial decisions.

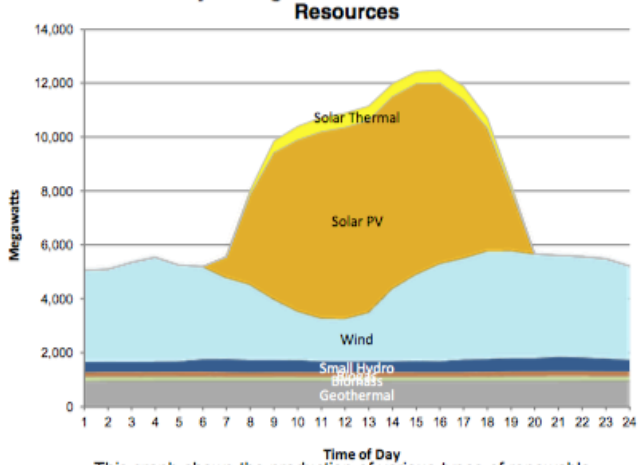
Renewables Production

24-Hour Renewables Production

Renewable Resources	Peak Production Time	Peak Production (MW)	Daily Production (MWh)
Solar Thermal	10:40	537	5,255
Solar	12:54	7,149	70,632
Wind	17:46	4,115	75,517
Small Hydro	21:03	542	10,463
Biogas	17:22	197	4,535
Biomass	20:06	186	3,947
Geothermal	0:00	953	22,515
Total Renewables			**192,864**
Total 24-Hour System Demand (MWh):			*615,441*

This table gives numeric values related to the production from the various types of renewable resources for the reporting day. All values are hourly average unless otherwise stated. Peak Production is an average over one minute. The total renewable production in megawatt-hours is compared to the total energy demand for the ISO system for the day.

Hourly Average Breakdown of Renewable Resources



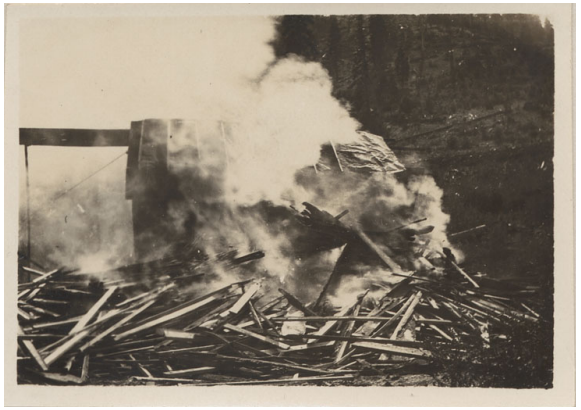
This graph shows the production of various types of renewable generation across the day.

System Peak Demand (MW) 29,440
*one minute average

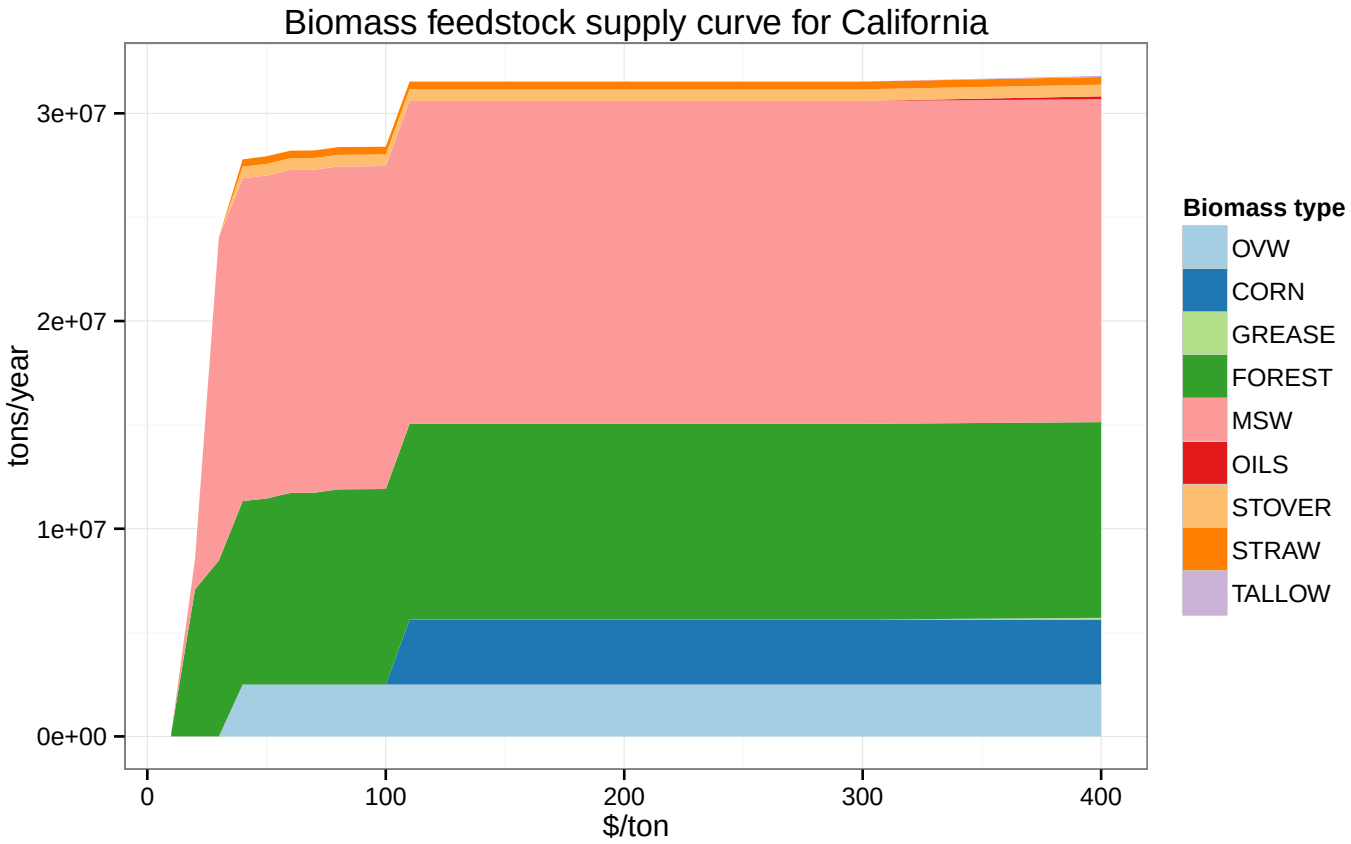
Time: 20:31

Provides beneficial means of disposal for low value biomass

- Agriculture
- Waste management
- In-woods slash
- Wood processing
- Urban green and C&D



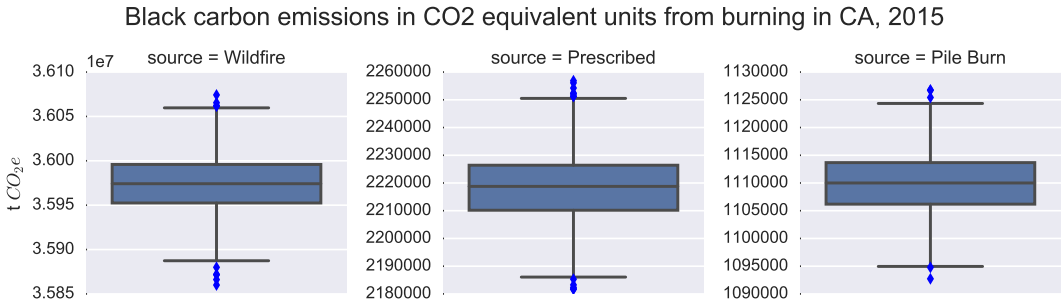
Biomass Supply in CA



Responsible use of a residual material

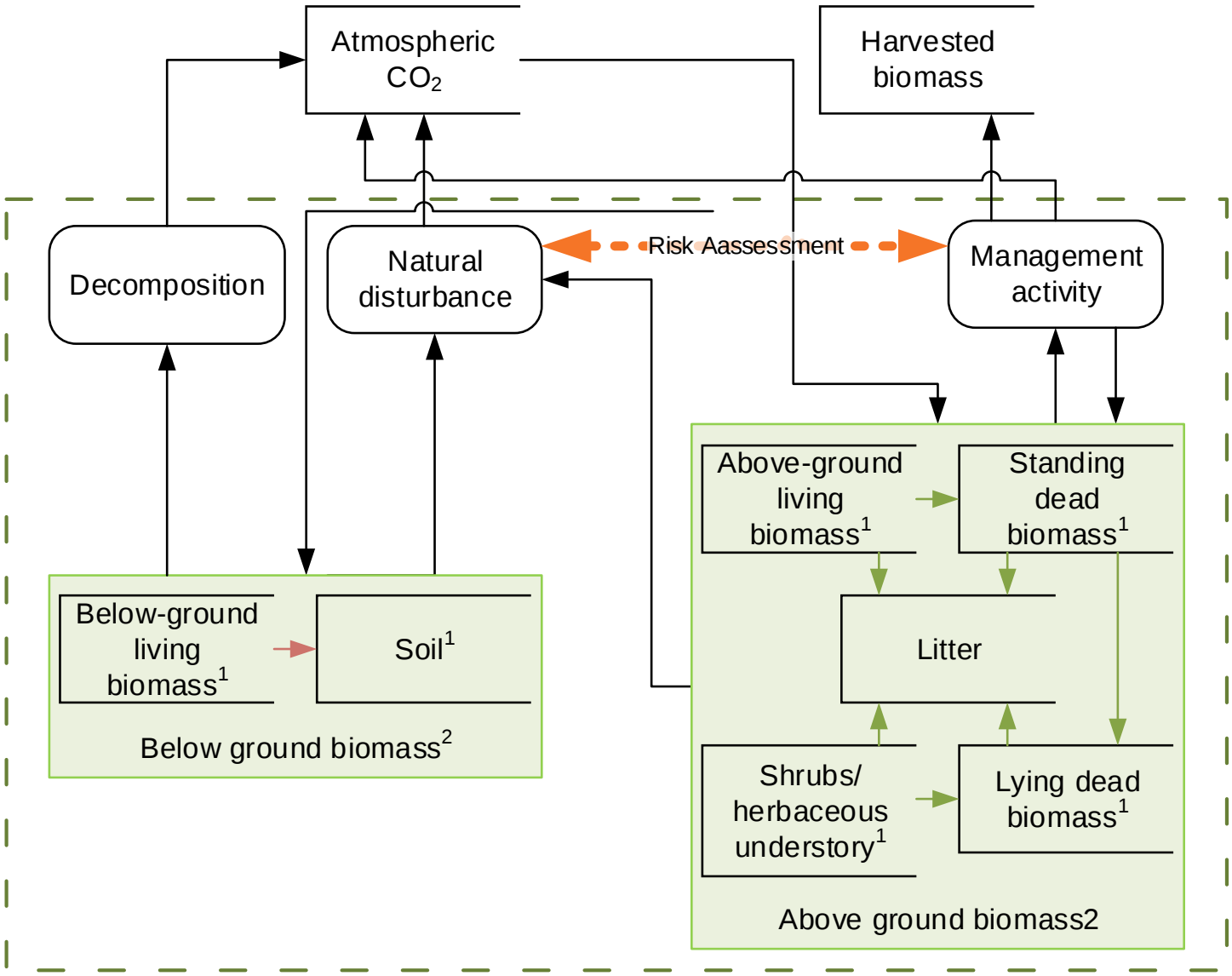
Alternate fate would have substantially worse public health and climate impacts produces renewable electricity.

Black Carbon

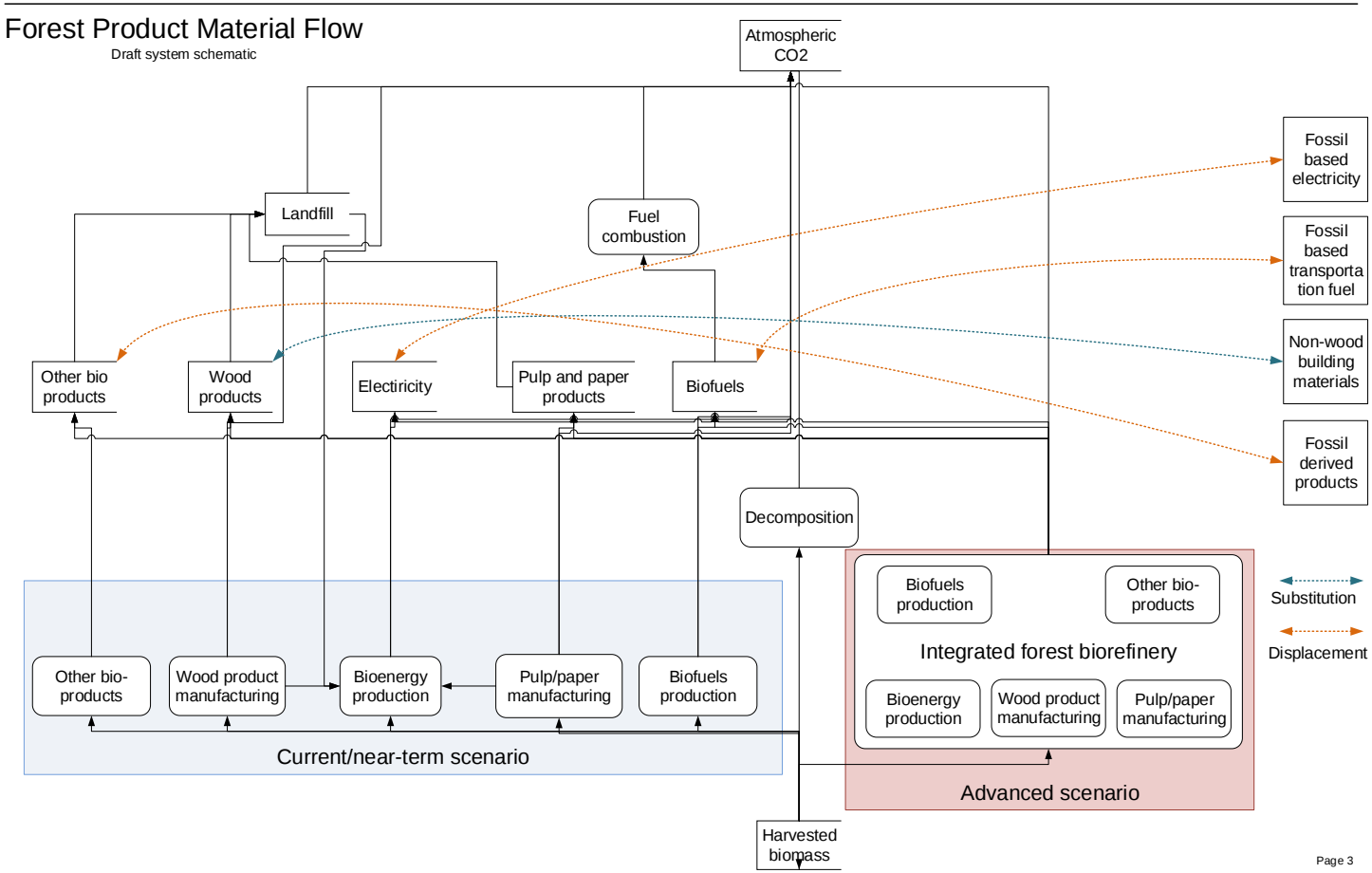


Sources: CARB Criteria Pollutant Emissions Inventory(2015), Ward and Hardy (1989)

Review carbon dynamics in forest systems.



Review carbon dynamics in energy and forest product markets.



Carbon intensity of wood products

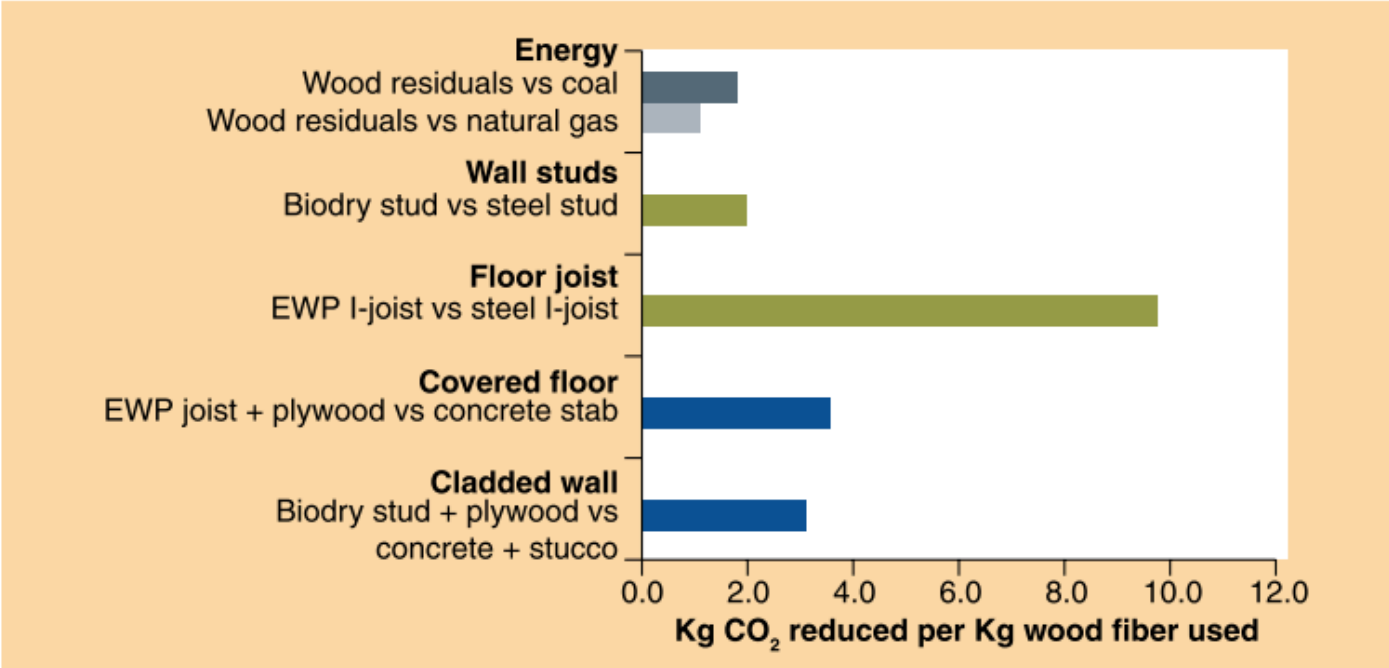
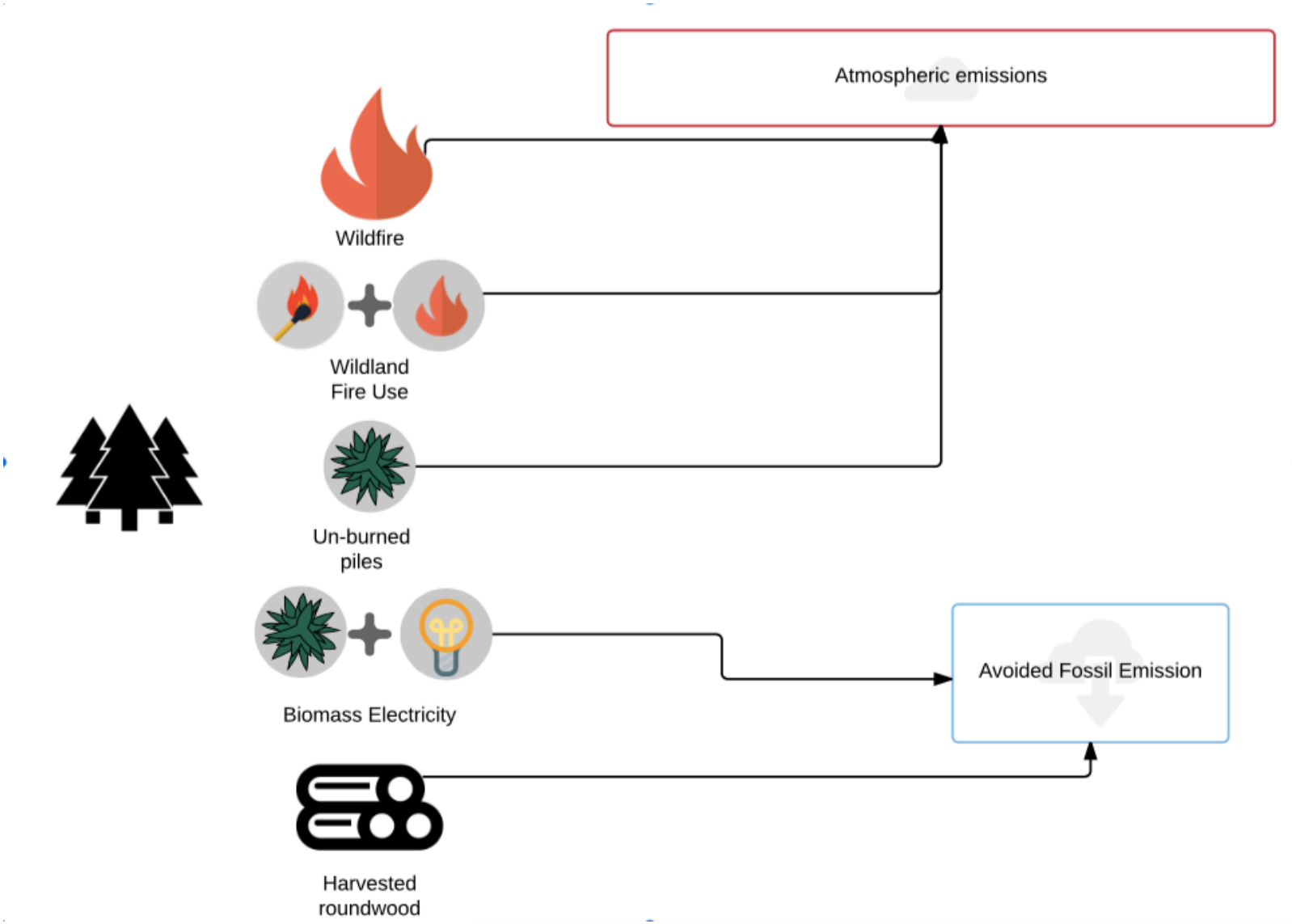
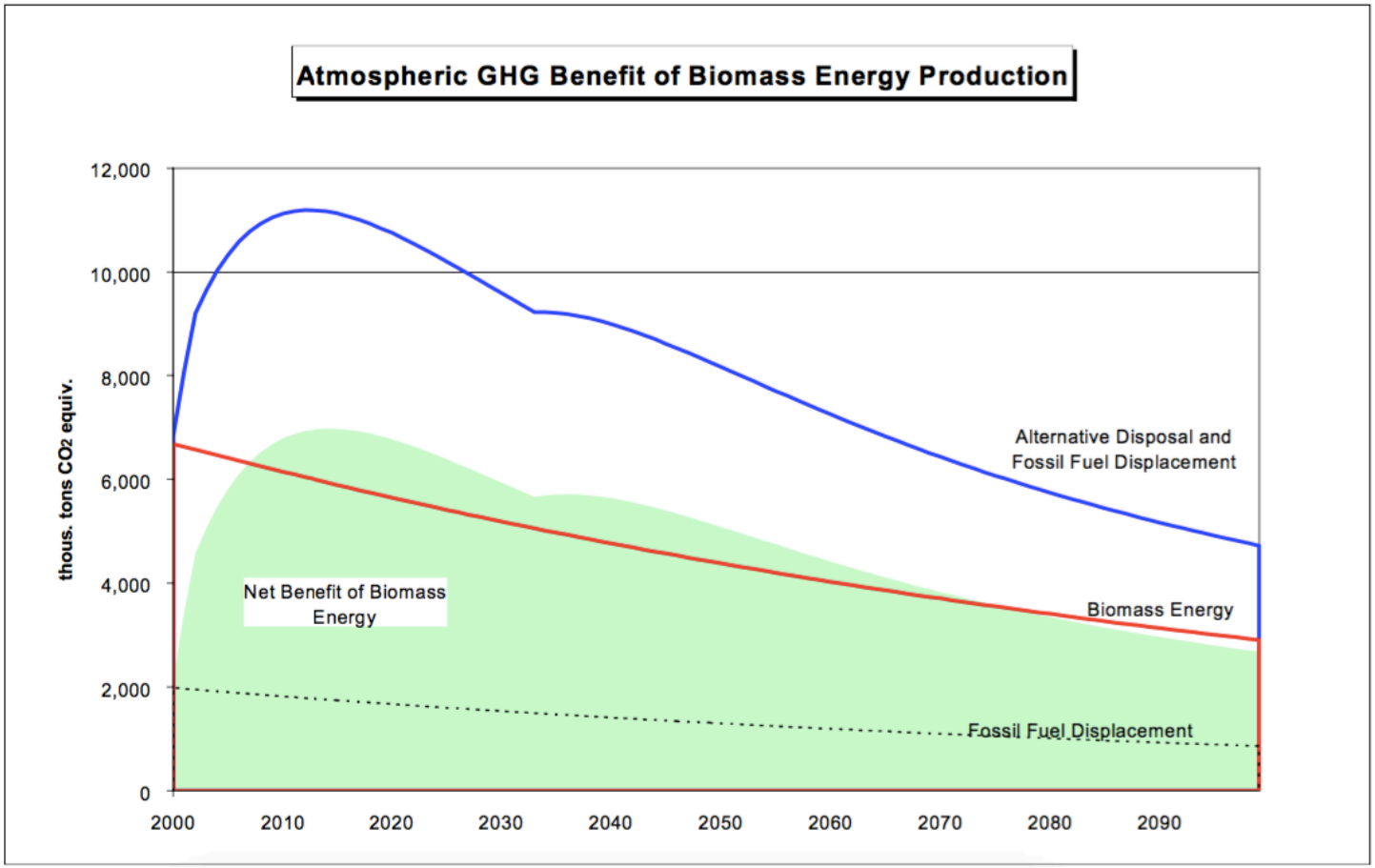


Figure 5. Carbon emission reduction by displacing non-wood products.
EWP: Engineered wood product.
Reproduced with permission to publish from CORRIM [107].

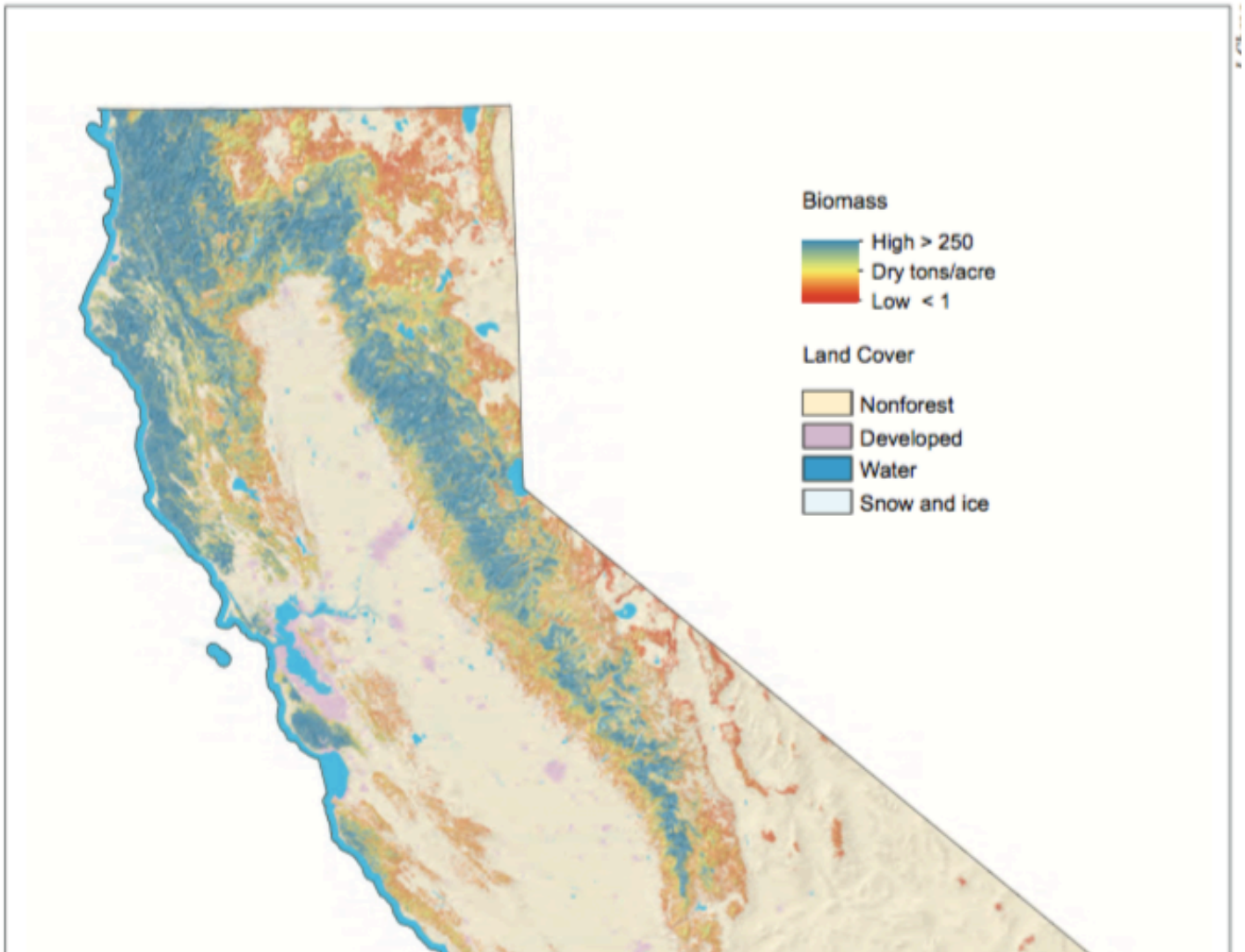
Fates of forest biomass



GHG emissions impact from biomass energy over time



Biomass is a local resource



Supports regions forests

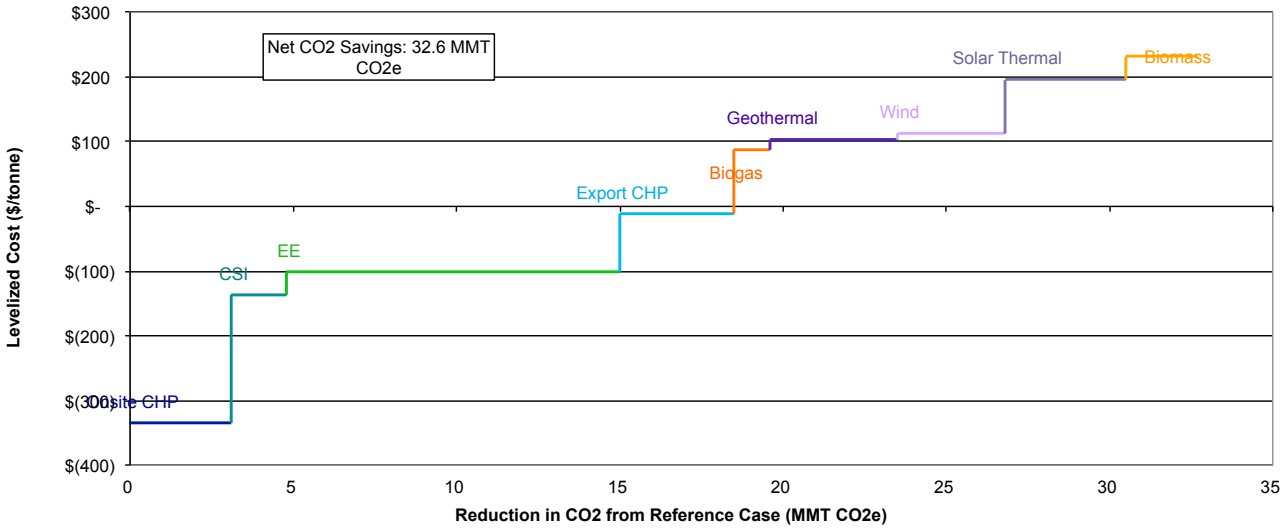
- Offset costs for non-commercial forest management:
  - SOD containment
  - Oak habitat retention
  - Fire hazard reduction

Supports the regional economy

- Critical to regions forest product economy
  - Mills will close without a buyer for residuals.
- Forest products and carbon economy will become more important following legalization of cannabis.

CCA's and biomass

- Must price biomass right to reflect the value to the region in addition to 'renewable' (hint: \$60-70/MWh won't do it..)
- Biomass is costly compared to other low-carbon renewables, but also much more valuable to the regions economy and forest lands



Take-home messages

- Markets for forest products (including residuals) ensure that working forests persist on the landscape and are managed sustainably
- Biomass energy on the North Coast as a part of a CCAs diverse portfolio, will support the regions forests, as well as provide carbon neutral electricity
- A sustained price signal from a CCA, combined with explicit environmental performance standards reflecting the communities values will drive investment in innovation in the regions bioeconomy.