

DOES LOGGING FORESTS LOWER FIRE RISKS AND IS WOODY BIOMASS CLEAN, RENEWABLE ENERGY?

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WOODY BIOMASS SCALING UP

- ~1.6 billion dry tons/yr in the US potentially available by 2030 (30% of current petro use)
- California: 14 million tons available/yr
- Obama Administration committed to 3 Gigawatts of renewables (including biomass) by 2025

Source: J.R. Shelly



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FRAMING THE THINNING/WOODY BIOMASS ARGUMENT

- Fires are bad - increasing as “eco-disasters”
- Thinning is good – slows or even stops fires
- Biomass is the win-win – displacement of fossil fuels



THE ECOLOGICAL IMPORTANCE OF MIXED-SEVERITY FIRES NATURE'S PHOENIX

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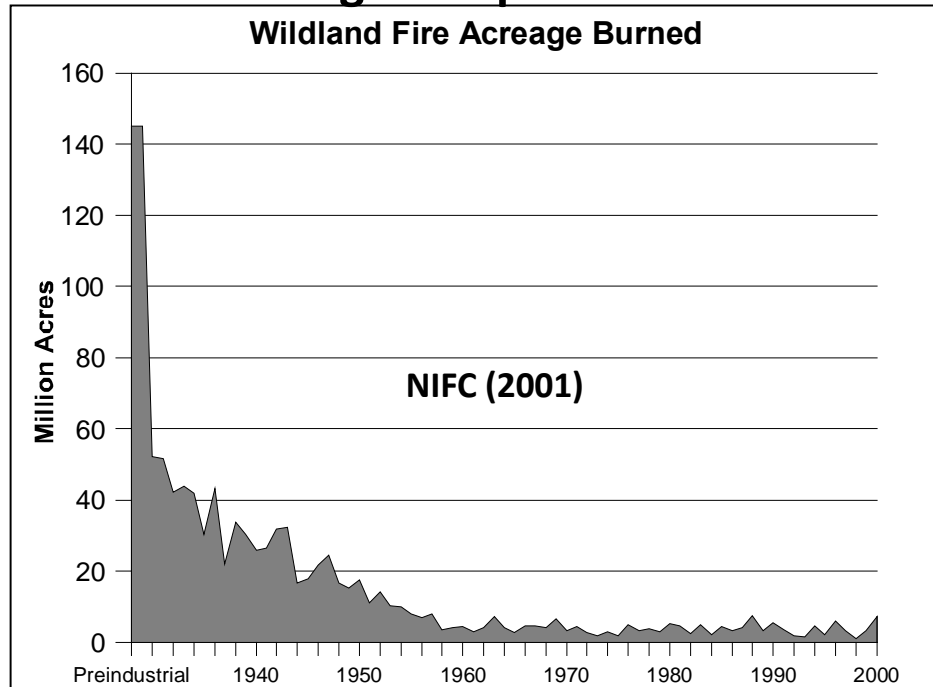
FIRE IS NOT AN ECO-DISASTER

Fire is to dry forests as rain is to rainforests.

Ecosystems and species are resilient.

Some regions have experienced recent increases but overall fire deficit.

Climate change—"elephant-in-the room"



FRAMING THE THINNING ARGUMENT

- Reduces tree density which prevents “catastrophic” burns
- Can improve wildlife habitat otherwise “destroyed” by fires
- Produces fewer emissions by preventing forest fires (large CO₂ emitters)
- Byproducts (woody biomass) are carbon neutral



THINNING EFFECTS ON FIRE DEPEND ON MANY FACTORS

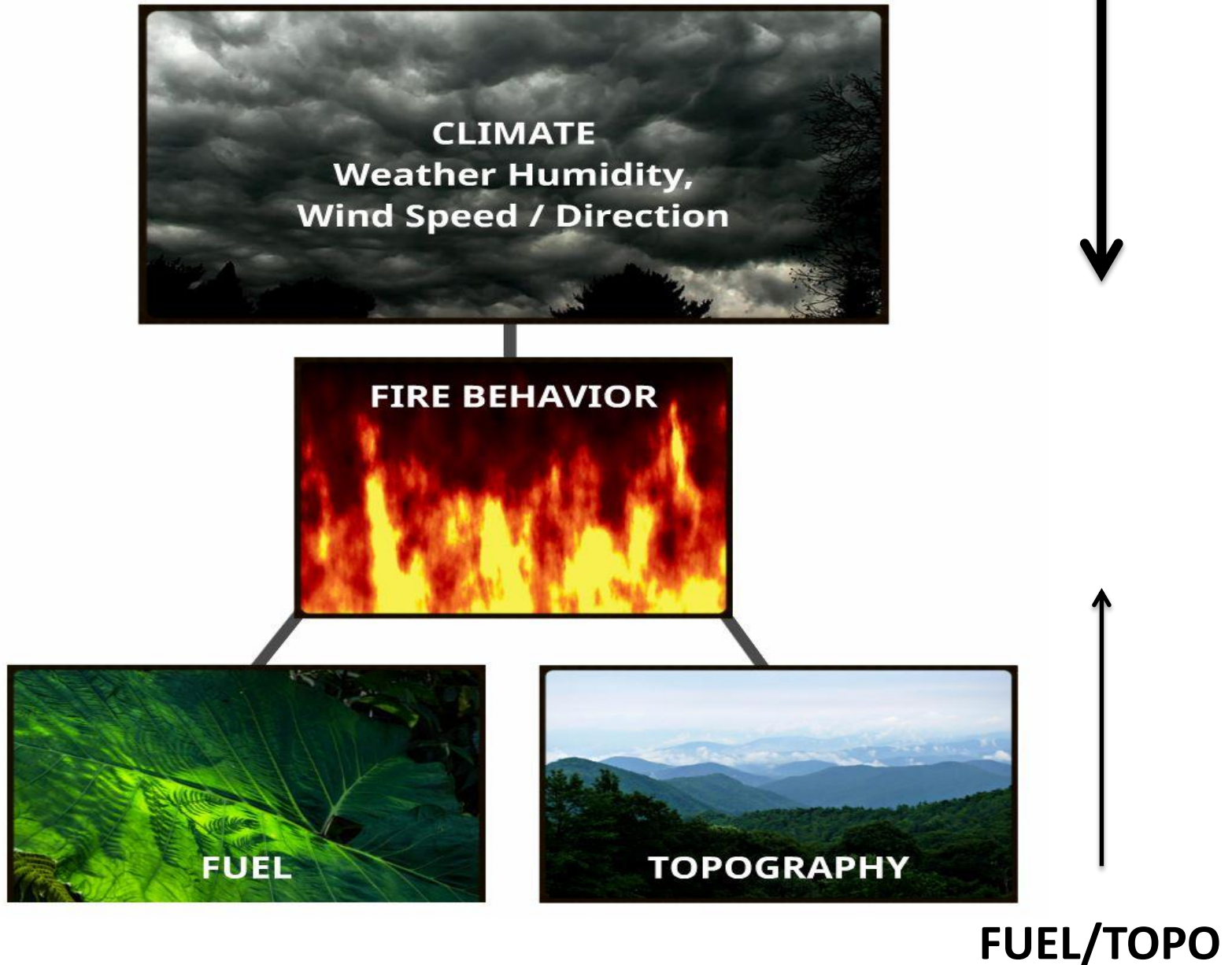
- Won't work during extreme weather
- Too much thinning increases wind speed and flammable vegetation
- Doesn't last long – 10 yrs
- ~5% chance of thinned site encountering a fire when fuels lowest (Rhodes & Baker 2008)



FRAMING THE LOW THINNING EMISSIONS ARGUMENT

- **Thinning lowers emissions compared to fires – not so:**
 - **Fire has small effect on forest carbon flux compared to intensive logging**
 - **Charred wood remains for decades, carbon remains in soils for century**
 - **Effect on climate is small unless fires increase greatly in size/intensity**

**THINNING IN CLIMATE-REGULATED FIRE REGIMES IS HIGHLY UNCERTAIN
ESPECIALLY DURING EXTREME FIRE WEATHER (DellaSala et al. 2015)**



IS THINNING “SUSTAINABLE/RENEWABLE?”

(impacts depend on intensity and scale)

- Some species benefit – increased openings
- Degrades spotted owl habitat
- Can increase fire spread (wind, fuels)
- Soil damage (depends on intensity)
- Invasive species
- Water quality impacts
- Increase in carbon flux
- Depleted soil fertility eventually requiring fertilization, which increases emissions
- Shorter rotations (30-50 yr) increase nutrient removal, decrease site productivity



Source: Aber et al. 1989, Peckham & Gower 2011, Bev Law

Photos: D. Odion, K. Schaffer

IS WOODY BIOMASS FOSSIL FUEL DISPLACEMENT?

- Assumption behind expected GHG benefits of bioenergy: a unit of bioenergy use reduces fossil energy use by the same amount
- Non-hydro renewables do not displace, and may do the opposite (York 2012)

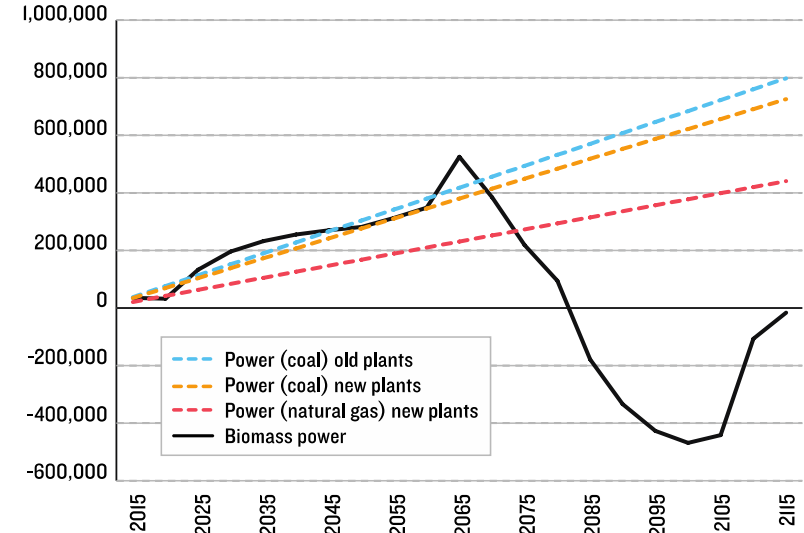
Source: Bev Law



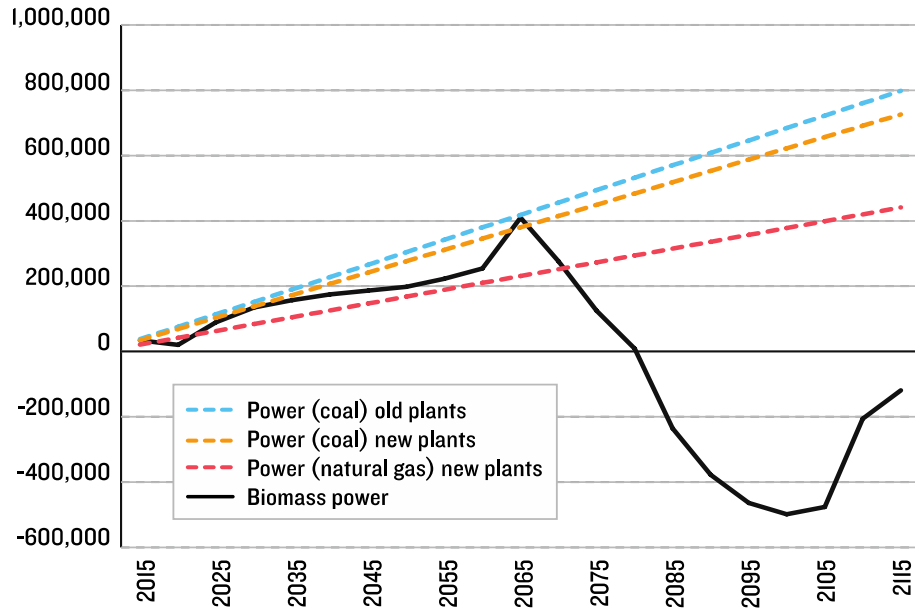


WOODY BIOMASS – THE NEW COAL?

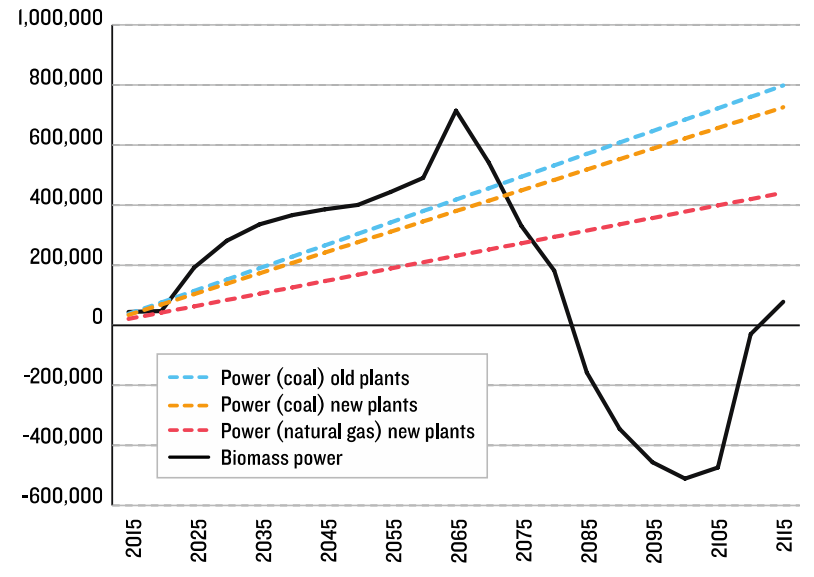
Pellets made of 40 percent whole trees



Pellets made of 20 percent whole trees

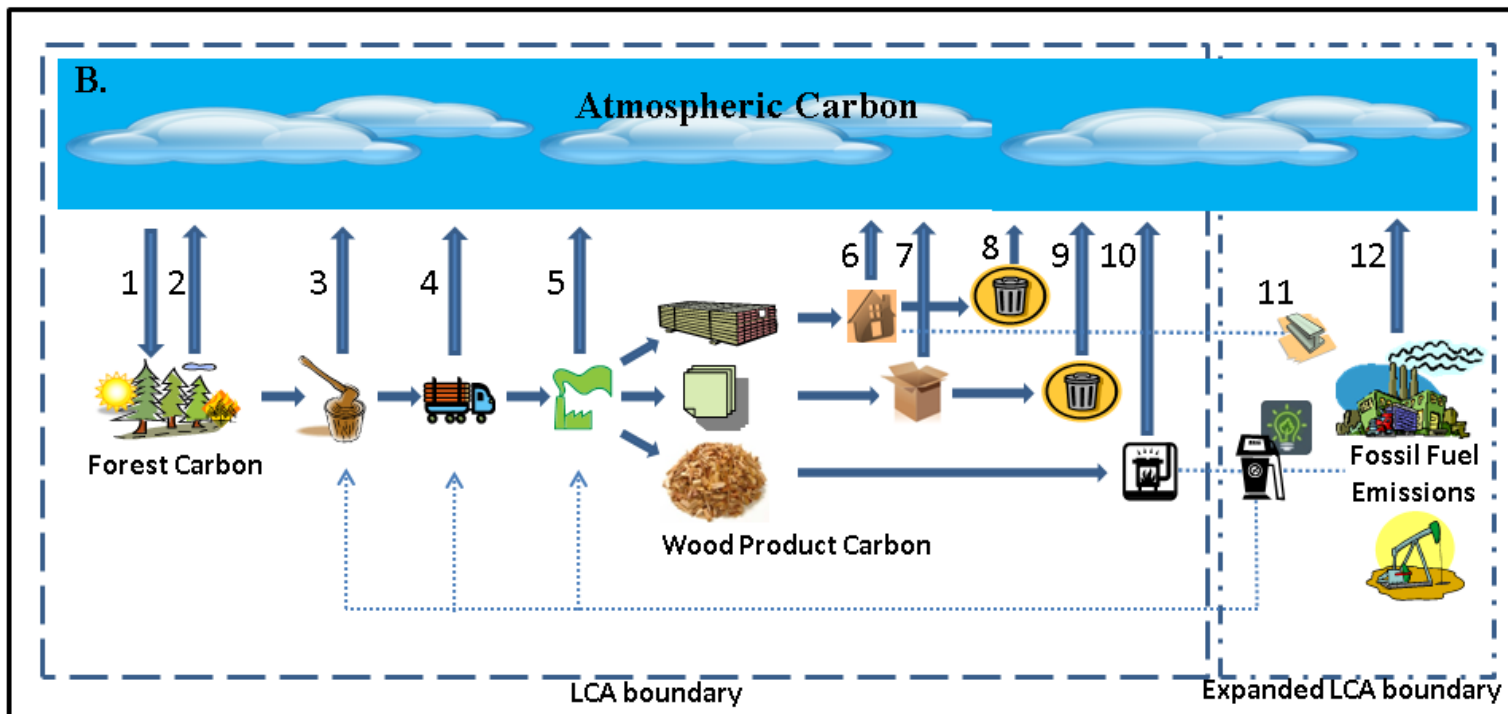


Pellets made of 70 percent whole trees



Cumulative Emissions (source: NRDC 2015)

Life Cycle Assessment Needed to Account for Carbon Losses

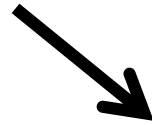


- Emissions associated with production/transport/usage of wood
- Substitution and displacement of fossil fuel emissions associated with extraction and use

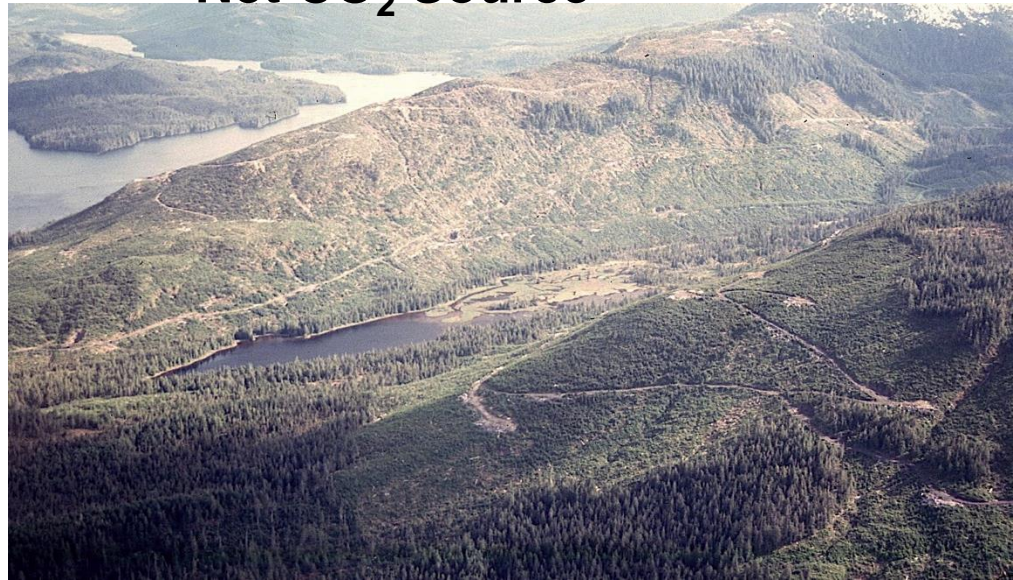
CARBON MANAGEMENT CHOICES



Net Carbon (C) Sink



Net CO₂ Source



- **Manage existing forests for C – extend rotations, protect old forests**
- **Natural disturbance has small impact on C compared to intensive logging unless frequency and intensity increase greatly**
- **Large scale thinning for bioenergy does not reduce emissions**



Declaration (signed by 110 groups across the globe):

- **Large-scale bioenergy must be excluded from renewable energy definition.**
- **Bioenergy can provide a sustainable energy option, but only when produced on a small-scale basis, and only if the health impacts are taken into account.**
- **The EU cannot be allowed to continue the current model of energy consumption, promoted through false assumptions about bioenergy being renewable.**
- **Claiming more land for bioenergy production, under the false premise that this is a contribution to climate protection, can only increase unacceptably high land footprint.**
- **A positive step and a good signal for the rest of the world would be to fully recognise the devastating direct and indirect impacts of large-scale....**

Source: www.biofuelwatch.org.uk/wp-content/uploads/BioenergyOut-Declaration-3.pdf

TREATMENT PLACEMENT: GETTING TO COEXISTENCE

Manage wildfire for ecosystem benefits



Defensible space – home ignition zone



Thin to reduce fuels, improve habitat but don't expect C benefits



Treat valley foothills – but be mindful of limitations, uncertainties, damages

