

Making Biomass Work or Making Work for Biomass?

Pricing, Markets and Financial Support Panel

April 6, 2006

Mark Nechodom, USDA Forest Service

PSW Research Station





The territory ahead....

1. Framing the Problem
2. Basic Economics
3. Policy Planet
4. Biomass to Energy
Research Program

Separate problems.....

**Forest
Health
and
Fire**

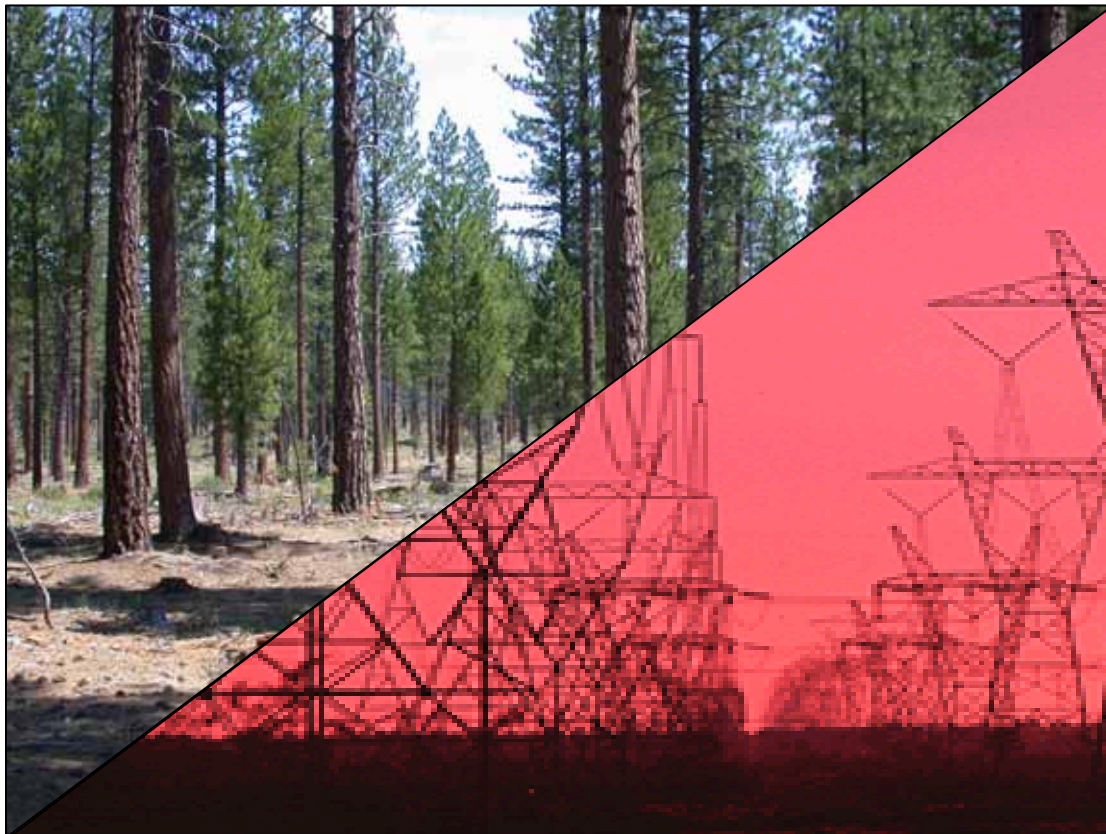


**Biomass
Energy**



...with connected solutions

**Forest
Health
and
Fire**



**Biomass
Energy**

How do we put pieces of a puzzle....

Forest Health



Biomass Utilization



Environmental Services



Healthy Communities





... together?

Forest Health



Biomass Utilization



Environmental Services



Healthy Communities



Essential Drivers

- Public Health and Safety
- Amenities and Recreation
- Watershed Protection
- Ecosystem Values and Services



Fundamental Assumptions



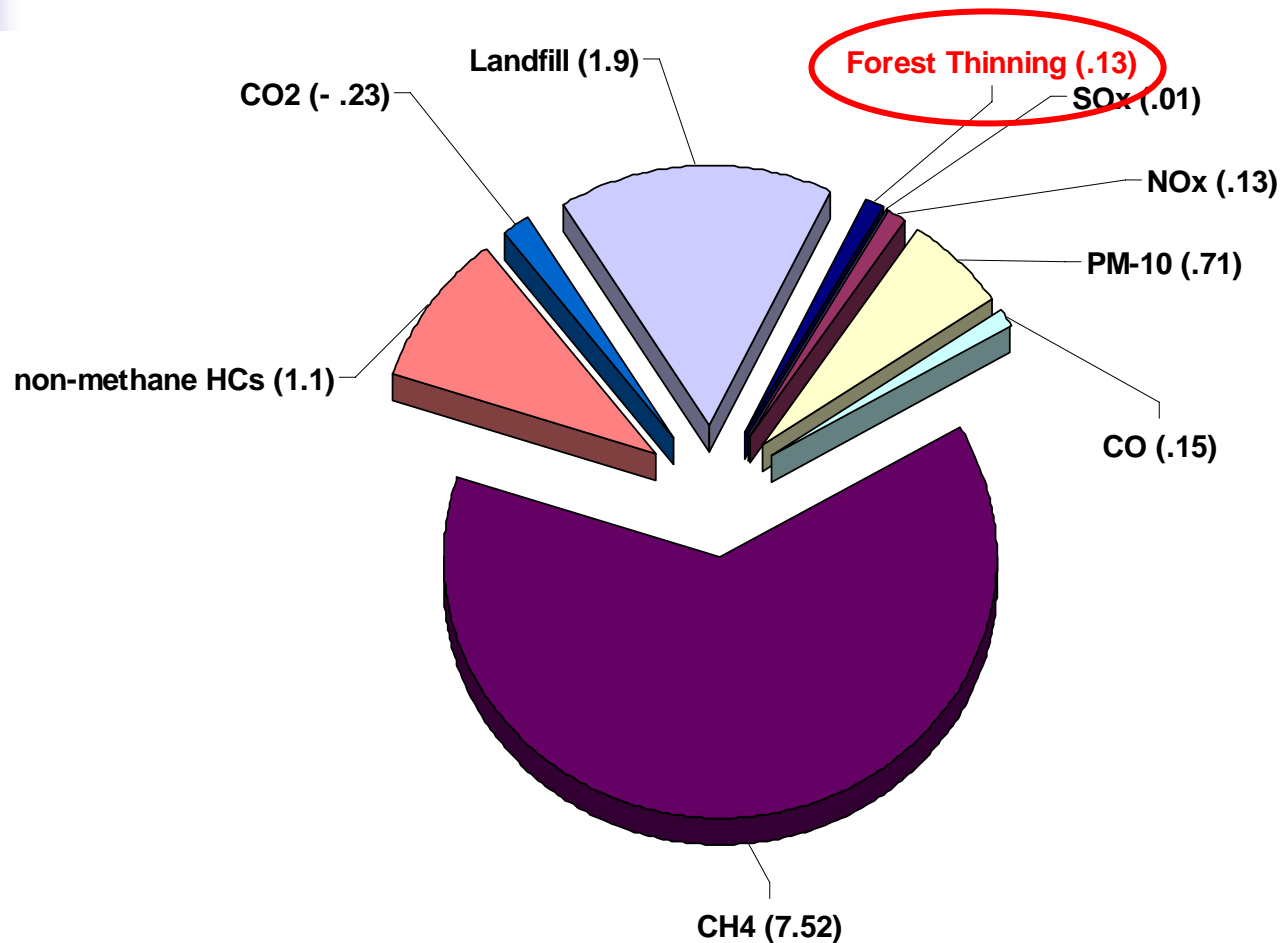
- A lot of biomass will go somewhere (“up, down or out”)
- It is a *waste problem*
- There are opportunities to turn wastes into commodities



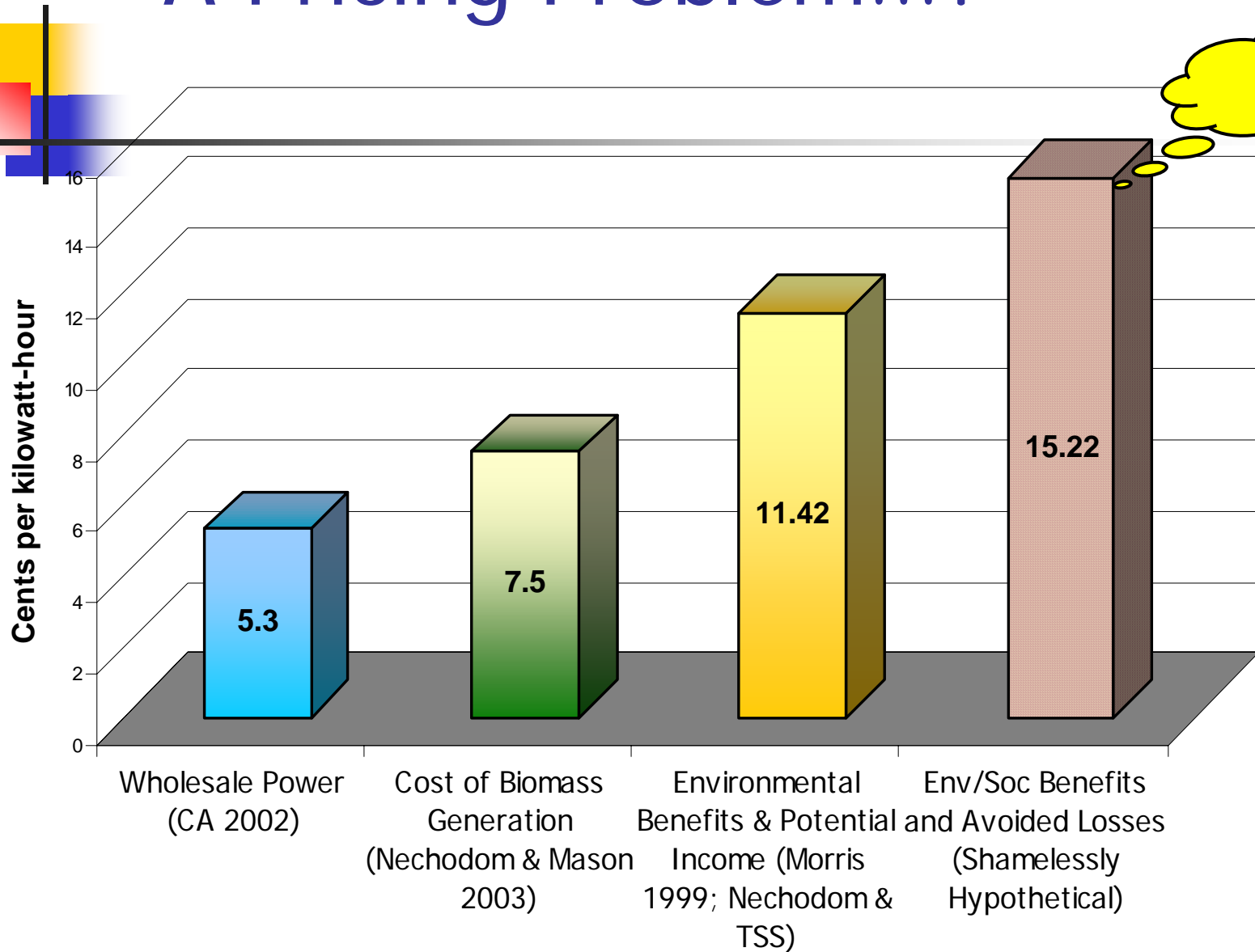
Benefits of Biomass Utilization via Bioenergy

- Environmental improvement (air, water, waste, habitat)
- Forest health & reduction of catastrophic wildfire
- Decrease use of fossil fuel
- Increased diversity and security of energy supply
- Local economic development from power generation and biomass fuels collection

Avoided Costs of U.S. Biomass Power Generation From All Sources = 11.4 cents/kWh



A Pricing Problem...?



Partial List of Impacts and Costs of Wildfire



- Greenhouse gasses
- Water treatment
- Timber losses
- Watershed damage
- Tourism and recreation
- Amenity values
- Wildlife habitat
- Disaster relief costs
- Lost jobs and wages
- Rehabilitation and restoration costs
- Transportation (movement of goods and services)
- Human health
- Evacuation and displacement
- Cultural and archeological sites



Ecosystem Services: A Cautionary Note

- What do we mean?
 - How do we play?
 - What beans do we count?
 - What counts as “a bean?”
 - What deals will we regret making?
- **Must be:**
 - **Countable**
 - **Tradable**
 - **Negotiable**
 - **Available**
 - **Transparent**
 - **Institutionalized**

Project financial analyses

Avoided costs and losses

Pollution trading

Amenity values

Ecosystem services

Continuum of Values and Methodologies

Private Markets



Non-Market Values

Greatest degree of price certainty



Least degree of price certainty

Greatest degree of methodological confidence



Least degree of methodological confidence

Facility emissions

Ambient concentrations

Doses to sensitive species

Stated preferences about environmental impacts



Policy Drivers

- Markets are made, not born
- Rules of the road
- Wealth creation
- Wealth distribution



Energy Policy Act of 2005 : Woody Biomass Provisions

- **Section 210: USDA *may* issue grants to improve commercial value of forest biomass for electric power, heat etc**
 - Preferred communities can get up to \$500K total or up to \$20/ton of green forest biomass for forest biomass utilization
- **Section 209: DOE *may* issue grants for Rural and Remote community Electrification**
 - \$20 million/year in grants for increased efficiency or use of renewable energy including woody biomass
- **Section 944: USDA *may* issue grants for Small Business Bioproduct Marketing and Certification**
 - Matching grants up to \$100K, for a total of \$1 million/year



Energy Policy Act of 2005: Cellulosic Biomass Provisions

- **Section 932: Integrated Biorefinery Demonstration Projects**
 - Solicitation criteria to include commercial-scale demonstration of a variety of lignocellulosic feedstocks (including wood and forest slash)
- **Section 942: Production Incentives for Cellulosic Biofuels**
 - Achieve 1 billion gallons annually by 2015
 - Secretary of Energy shall set a per gallon incentive to be automatically awarded
 - After the first year that 1 billion gallons are produced, incentives shall be awarded via a reverse auction
- **Sections 1511 & 1512: Cellulosic Biomass & Renewable Fuels**
 - The Secretary may issue grants for the production of renewable fuels from cellulosic biomass



Energy Policy Act of 2005: Cellulosic Biomass Provisions

- **Section 1510: Commercial Byproducts from Municipal Solid Waste and Cellulosic Biomass Loan Guarantee Program**
 - Secretary of Energy shall provide guarantees of loans by private institutions for the construction of facilities for the processing and conversion of municipal solid waste and cellulosic biomass into fuel ethanol and other commercial byproducts
- **Section 1511: Renewable Fuel**
 - Secretary of Energy *may* guarantee loans to cover cost of loan guarantees to carry out commercial demonstration projects for cellulosic biomass and sucrose-derived ethanol

Section 1501: Renewable Fuel Standard – (including cellulosic ethanol)

Year	Renewable Fuels (billions of gallons)
2006	4.0
2007	4.7
2008	5.4
2009	6.1
2010	6.8
2011	7.4
2012	7.5



Principal State Policy Incentives for Biomass

- Renewable Portfolio Standards
- Renewable Energy Credits
- Public Benefit Funds
- Greenhouse Gas Reporting and Registries
- Climate Action Plans
- Biofuels Incentives



State-level Policies

■ Advantages

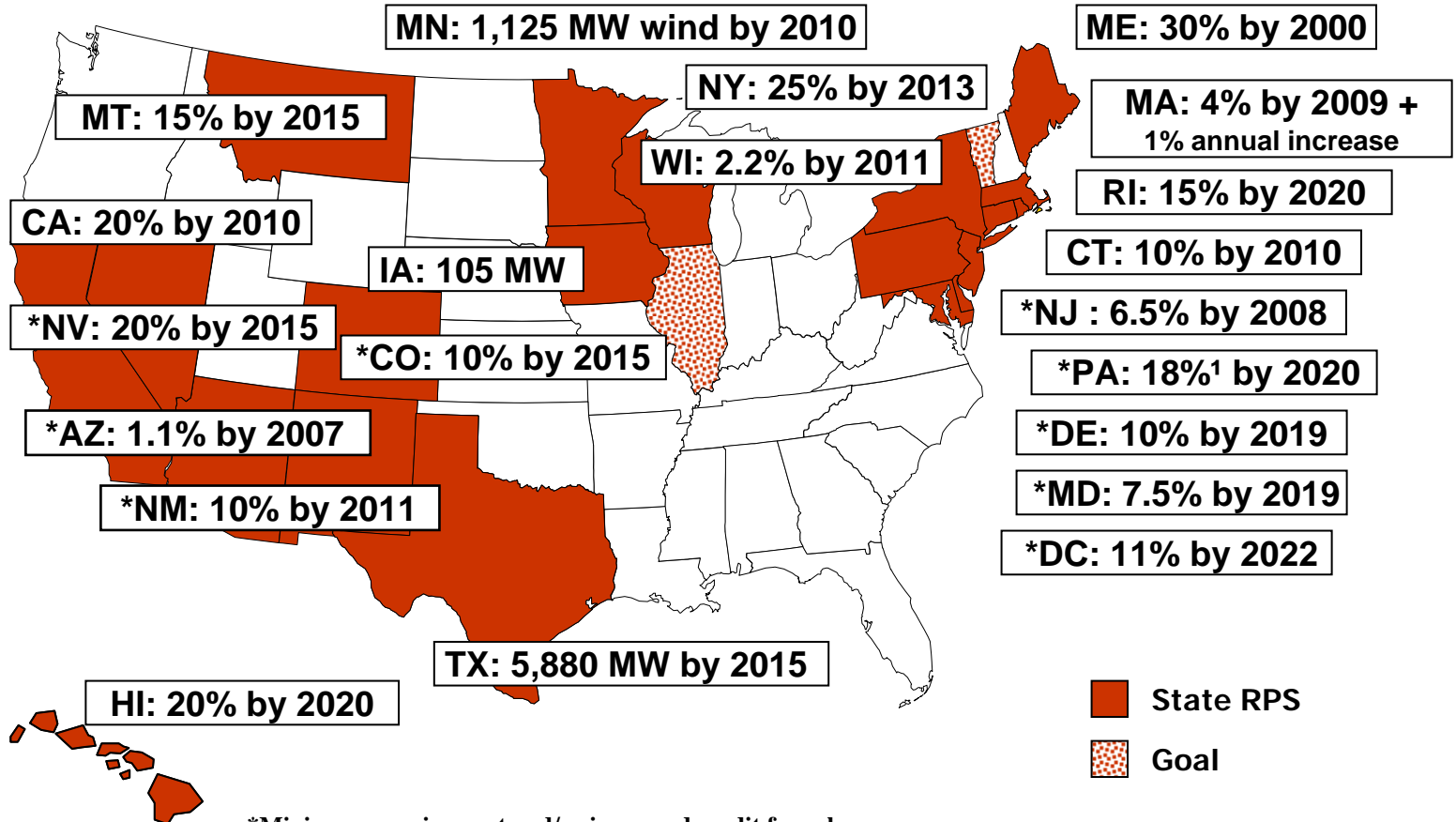
- States can function as “policy laboratories”, creating initiative models for federal action
- States have primary jurisdiction over many areas – electrical generation, agriculture, land use

■ Disadvantages

- Limited budget resources
- Lack of direct jurisdiction over certain areas – such as federal forests
- A ‘patchwork quilt” of policies across the nation can result – reacting difficulties for businesses and duplicating efforts

Renewable Portfolio Standards State-by-State

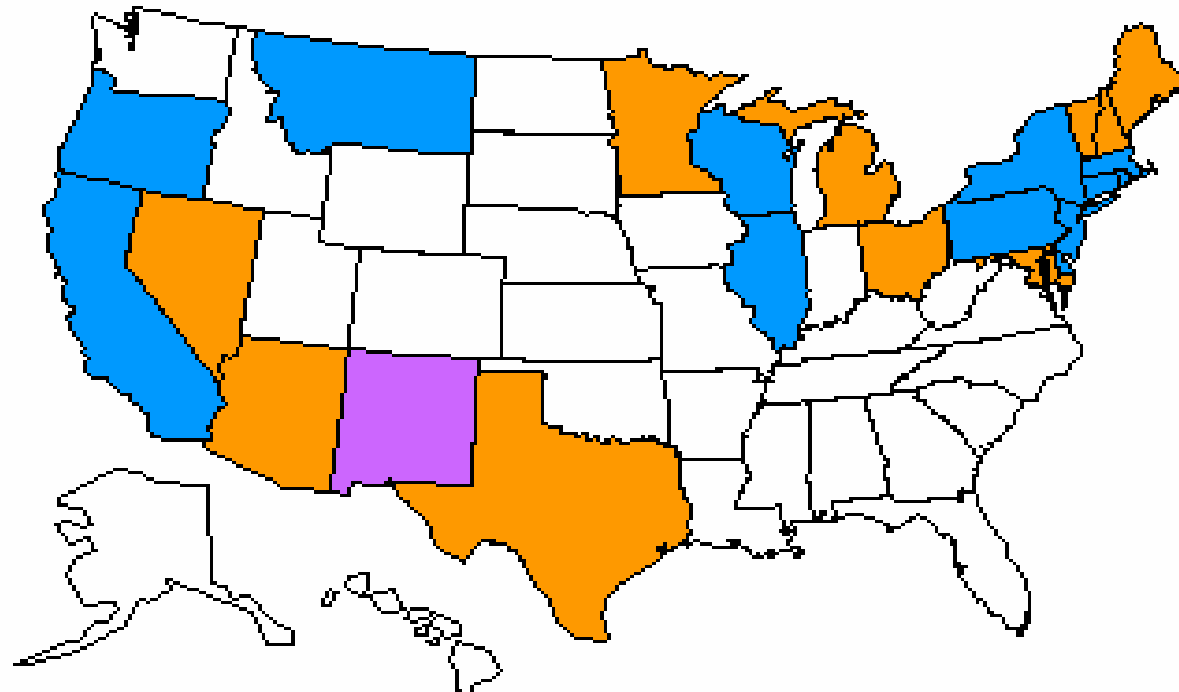
as of January 2006






*Minimum requirement and/or increased credit for solar

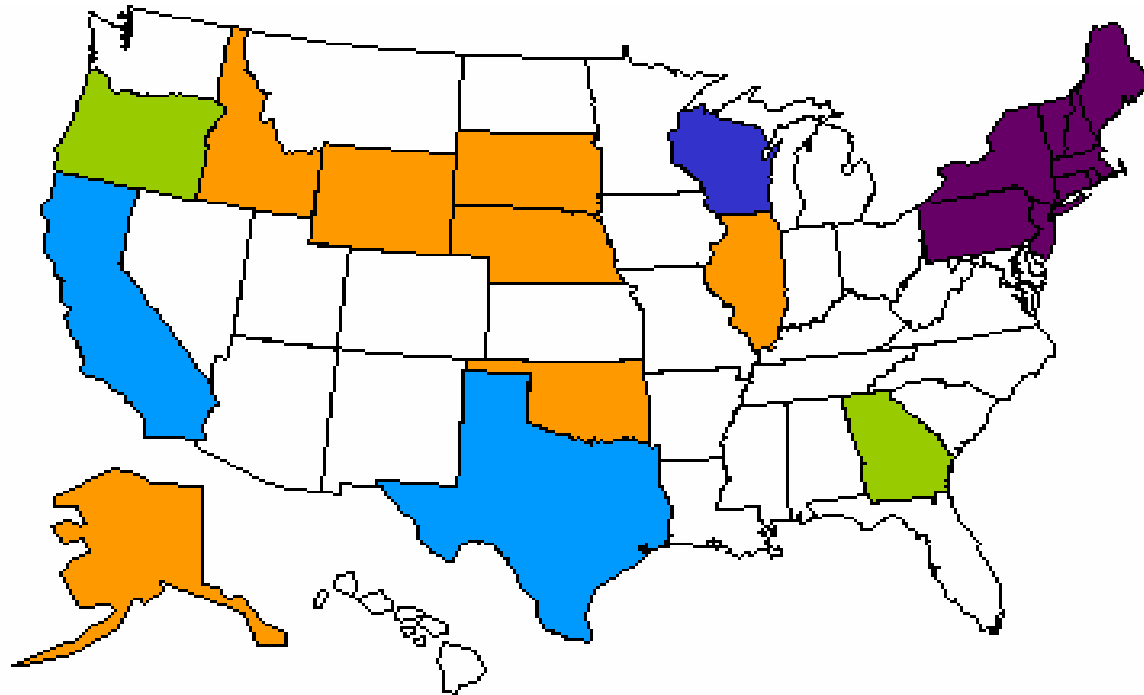
¹ PA: 8% Tier I, 10% Tier II (includes non-renewable sources)






State Public Benefit Funds



-  Funds that Support Energy Efficiency and Renewable Energy
-  Funds that Support Energy Efficiency
-  Funds in Development

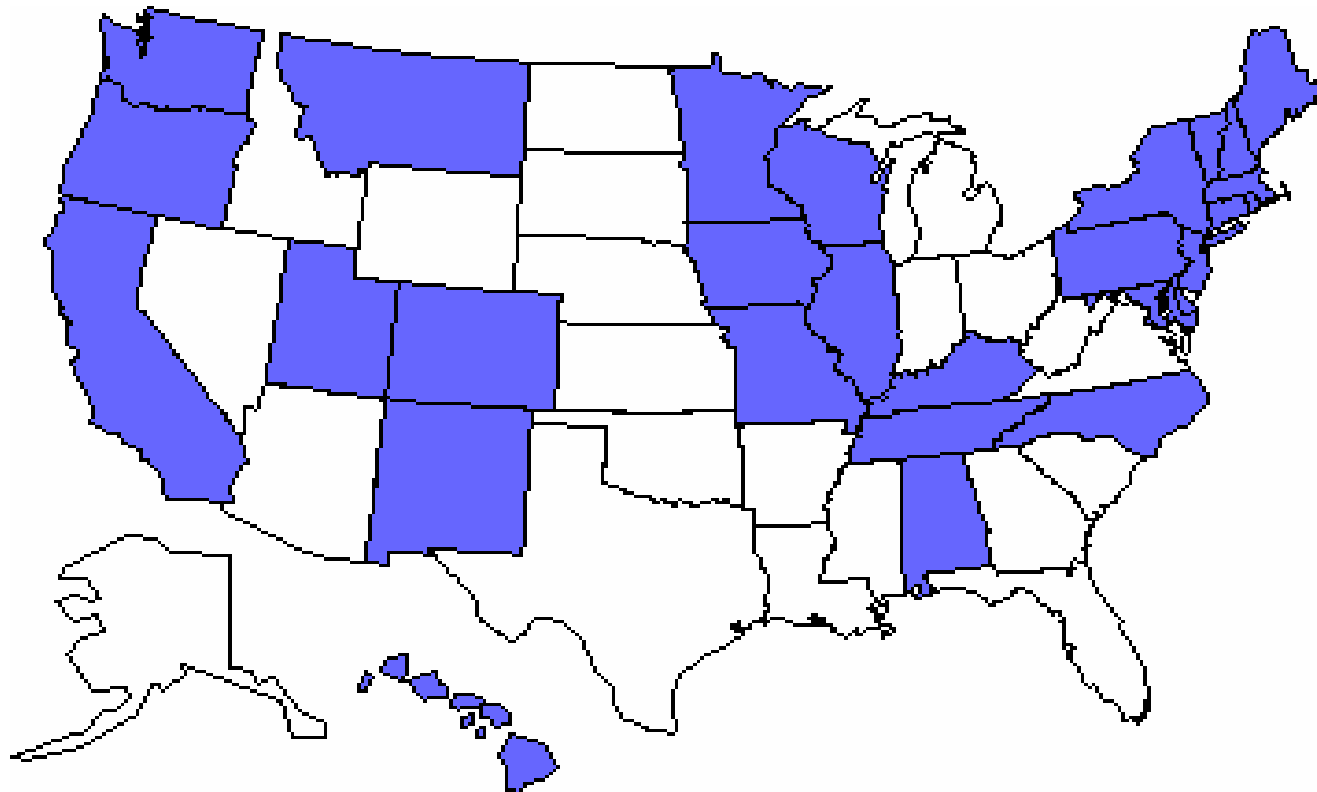
State Greenhouse Gas Reporting & Registries



- | | |
|--|---|
|  Mandatory Reporting |  Regional Greenhouse Gas Registry (RGGR) |
|  Voluntary Registries in Operation |  Carbon Sequestration Registries in Development |
|  Carbon Sequestration Boards Investigating Creating Registries | |



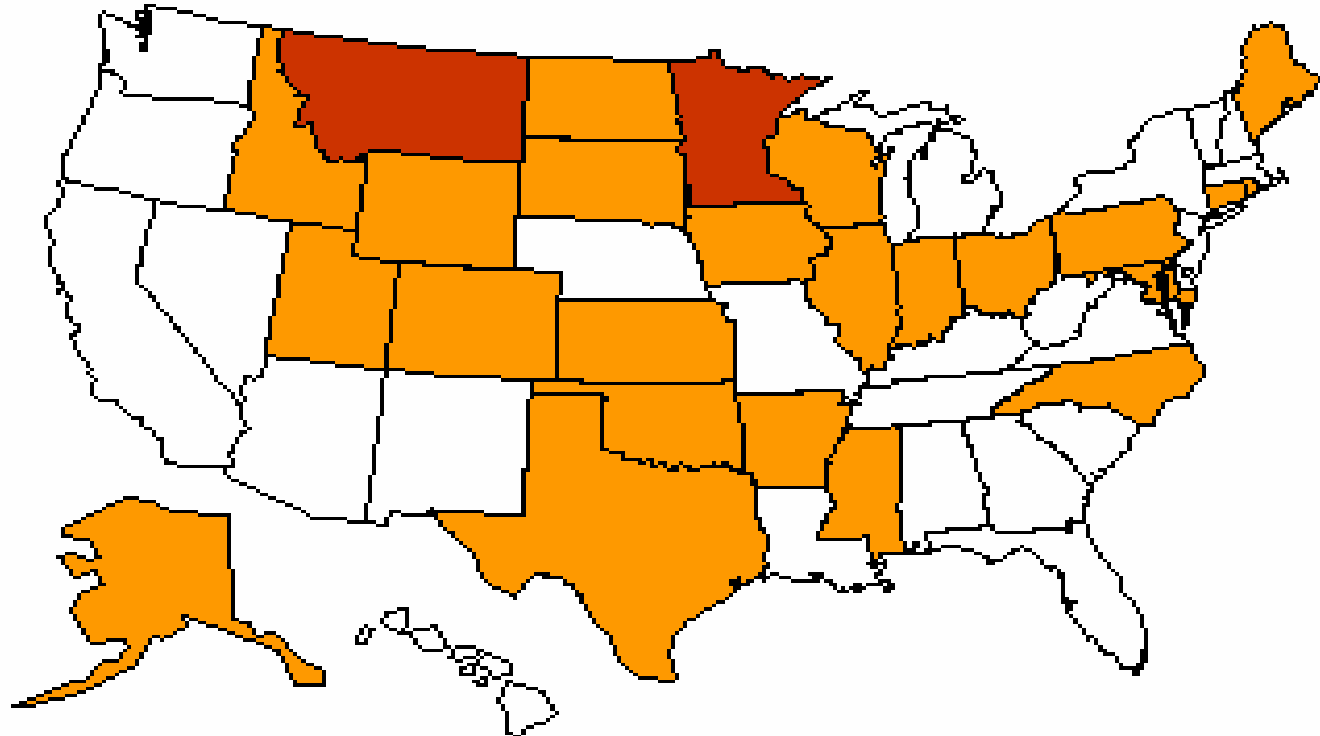
State Climate Action Plans



 Completed Climate Action Plans



States with Ethanol Incentives



-  Excise Tax Exemptions, Tax Credits, and/or Grants Promoting Ethanol Production and Use
-  Mandates supported by other incentives



Counting Beans

- System Functions
- Performance measures
- Common currency
- Accounting for change

- **Must be:**

- **Countable**
- **Tradable**
- **Negotiable**
- **Available**
- **Transparent**
- **Institutionalized**

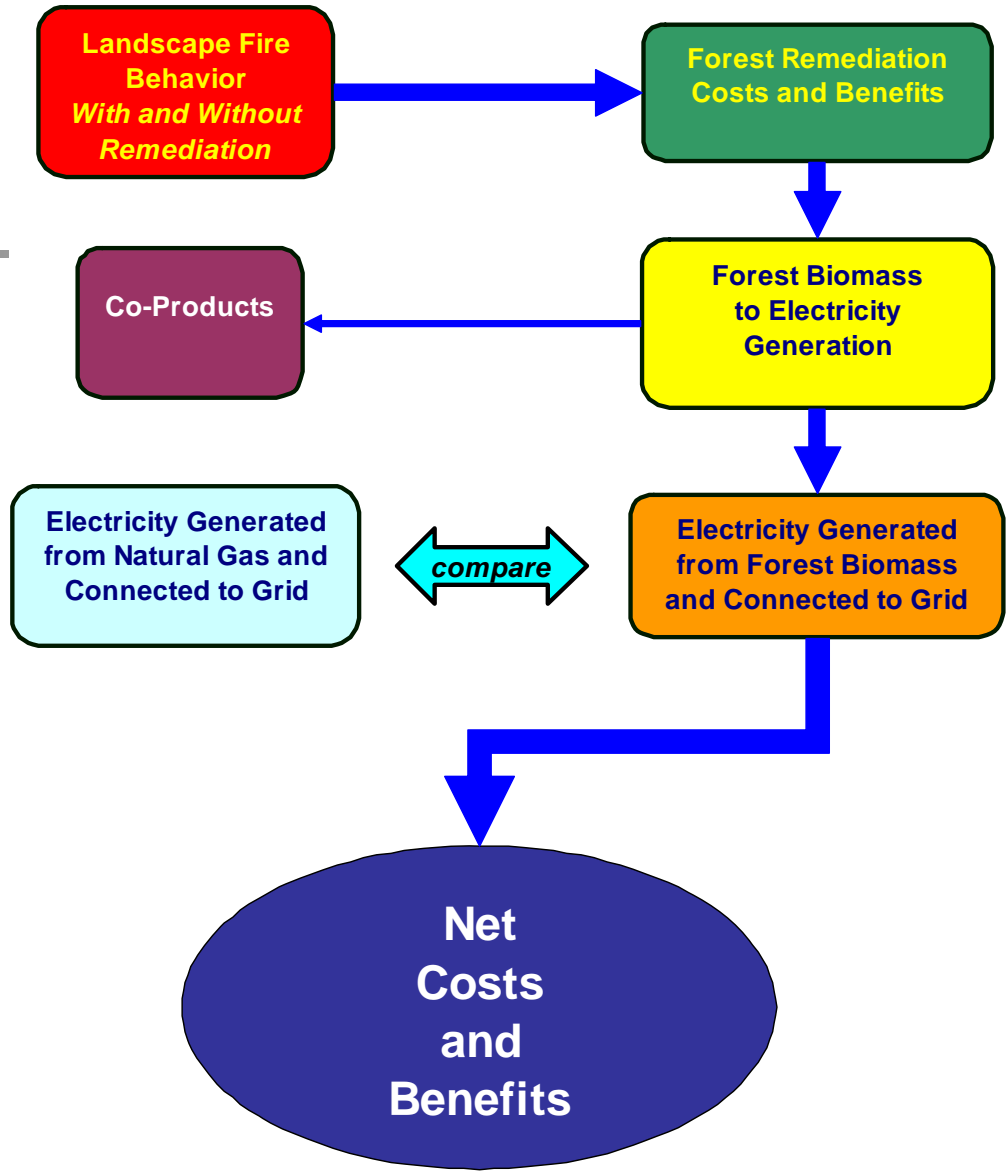


Purpose of B2E Project

- Model the economic & environmental values associated with using forest fuels treatment by-products for biomass energy
- Develop a decision-support tool to “game out” policy options
- Support “cross-media” trade-off analysis of environmental impacts and public benefits



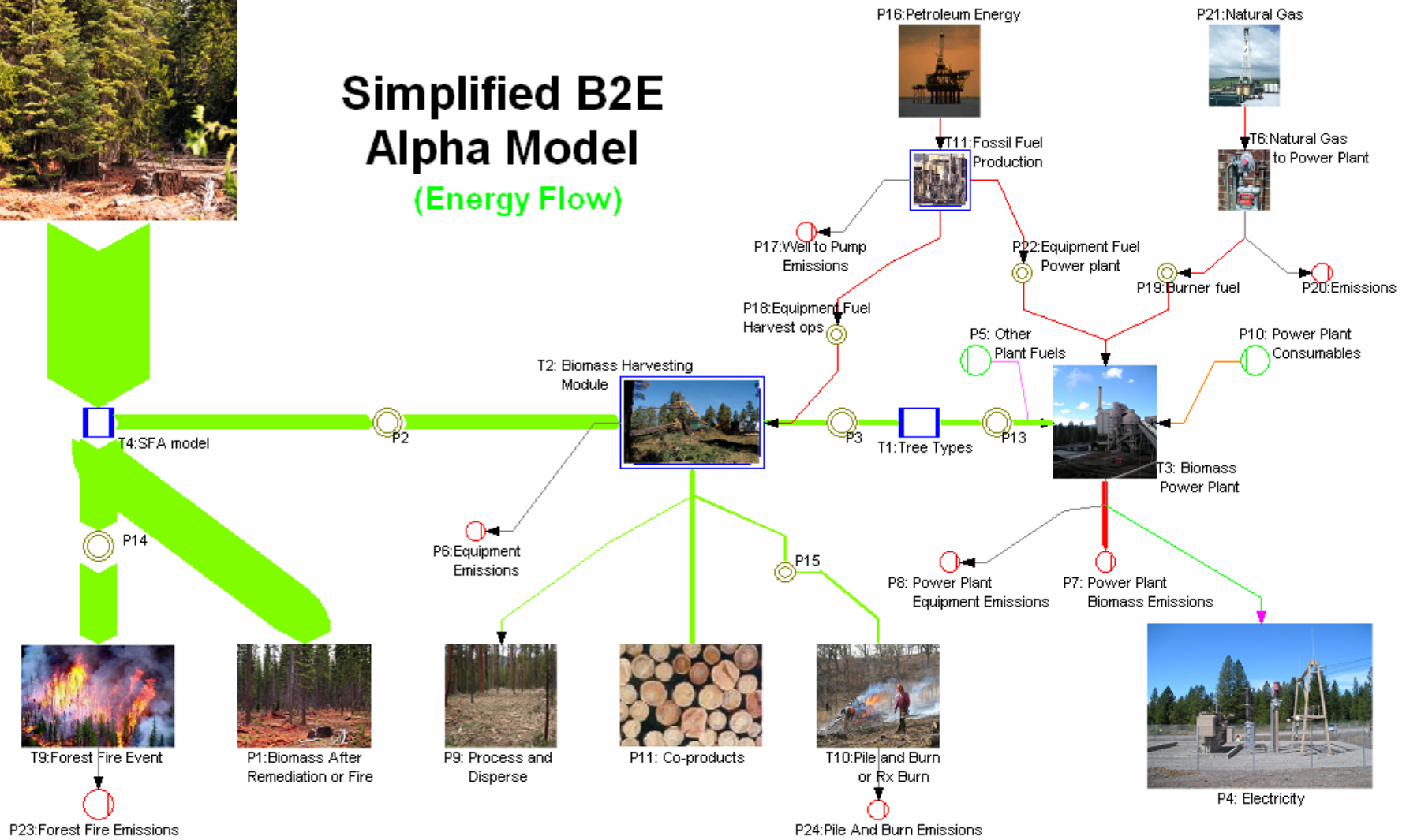
Basic Outline of B2E Model



P12:Landscape Archetype



Simplified B2E Alpha Model (Energy Flow)



Location of Beta 5 in California



Beta 5 Ownership

Owner Types



N
1:160,000

Beta 5 Acres: 2,775,641

- B2E "Beta" Landscape
 - 2.7MM acres
 - N. Sierra Nevada (Plumas, Lassen, Tahoe NFs)
 - Feather River Watershed
 - CASPO, NOGO & other key species
 - Hwy 89 "amenity landscape"
 - Several USFS research sites
 - ~ 45% Private Commercial Forestry