



Wood Fiber Supply in Oregon: Struggles Between Fiber Markets and Biofuel



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Oregon Biomass/Fiber Supply

- ❑ Mill Residues
- ❑ Hybrid Poplar Crops
- ❑ Construction and Demolition Debris
- ❑ Pre-Consumer Residues
- ❑ Forest Slash Recovery
- ❑ Metropolitan Solid Waste



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Biomass Energy Drivers

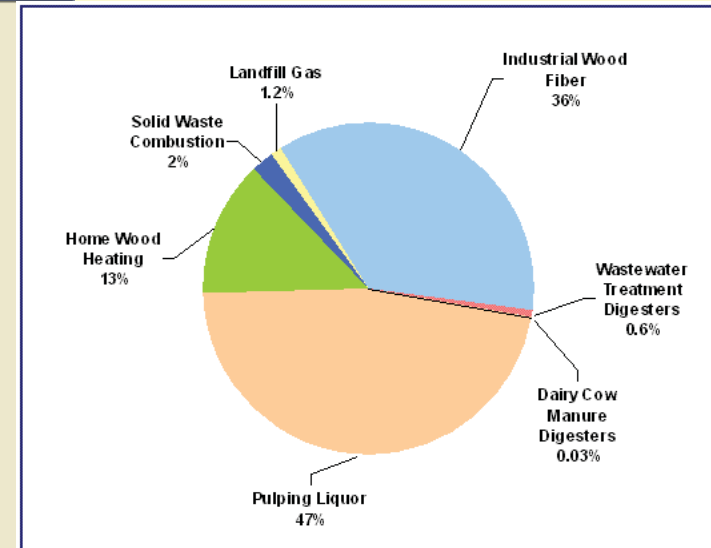
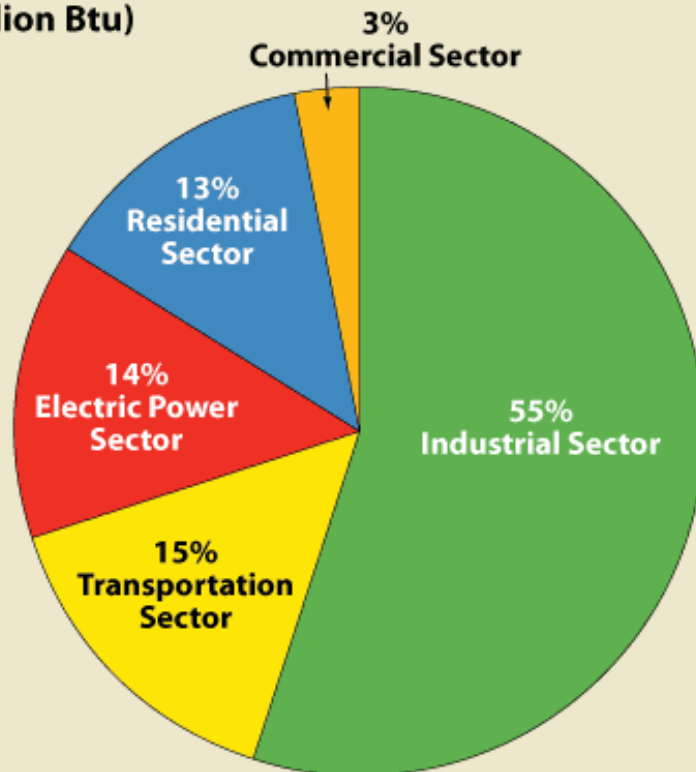
- ❑ Natural Gas Henry Hub \$6 +
- ❑ Petroleum Growth No Longer an Option
- ❑ California Renewable Portfolio Standard
- ❑ Oregon Renewable Portfolio Standard
- ❑ Liquid Fuels
- ❑ CO2 Markets Emerging
- ❑ Federal and Local Incentives



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U.S. Biomass Energy Consumption by Sector, 2006*

Percent of Total Biomass
(Trillion Btu)



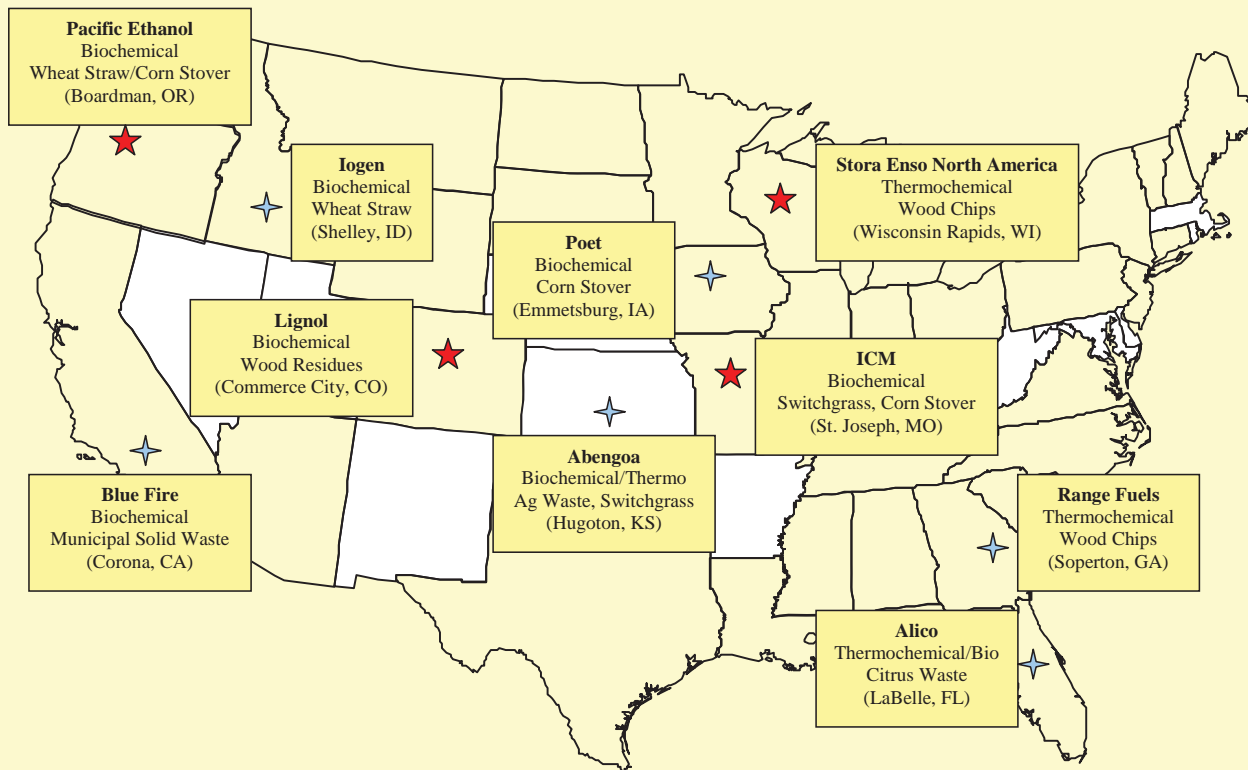
*The industrial sector does not include ethanol heat on co-products from the production of fuel ethanol and biodiesel.

Source: U.S. Energy Information Administration.



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Advanced Biofuels Development



★ Six Commercial-Scale Biorefinery Projects; DOE will invest up to \$385 million *~ 20 mm gallons/year*

★ Four Small-Scale Biorefinery Projects; DOE will invest up to \$114 million (first round) *- from 2-4 mm gallons per year*



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Oregon Biomass/Fiber Market Conflicts

- ❑ Mill Residue Supply Off
- ❑ Hybrid Poplar Crops Reconfiguring
- ❑ Construction and Demolition Debris Off
- ❑ Wood Products Steam Demand Plateau
- ❑ Forest Slash Recovery Fuel Cost
- ❑ Metropolitan Solid Waste Competition
- ❑ Paper Pulp Demand Flat



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Oregon Biomass/Fiber Demands

- ❑ Paper Pulp
- ❑ OSB
- ❑ Particle Board
- ❑ Animal Bedding
- ❑ Hogged fuel
- ❑ Densified Fuels



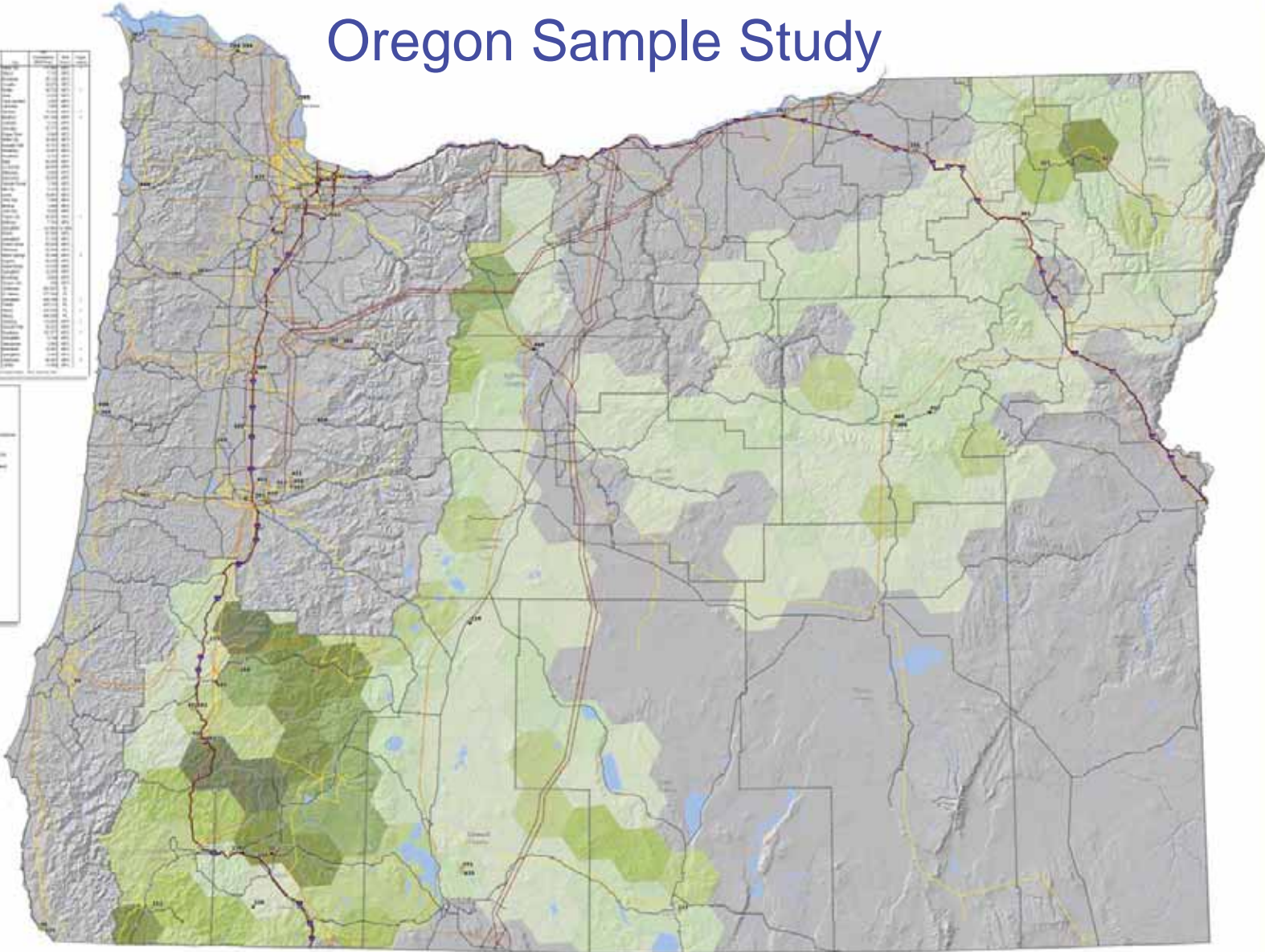
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Oregon Sample Study

Legend	Symbol	Description
Forest Biomass Facilities	Star	Wood Pulp Mills
	Star	Wood Chip Mills / Composites
	Star	Pulp Mill
	Star	Other Biomass Facilities
Power Transmission Grid	Line	High Voltage Transmission
	Line	Medium Voltage Transmission
	Line	Low Voltage Transmission
Forest Biomass Supply (Above-Bye) Areas	Shaded Area	100,000 - 200,000
	Shaded Area	200,000 - 300,000
	Shaded Area	300,000 - 400,000
	Shaded Area	400,000 - 500,000
	Shaded Area	500,000 - 600,000
	Shaded Area	600,000 - 700,000
	Shaded Area	700,000 - 800,000
	Shaded Area	800,000 - 900,000
	Shaded Area	900,000 - 1,000,000
	Shaded Area	1,000,000 - 1,100,000
	Shaded Area	1,100,000 - 1,200,000
	Shaded Area	1,200,000 - 1,300,000
	Shaded Area	1,300,000 - 1,400,000
	Shaded Area	1,400,000 - 1,500,000
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Legend

- Forest Biomass Facilities
 - Wood Pulp Mills
 - Wood Chip Mills / Composites
 - Pulp Mill
 - Other Biomass Facilities
- Power Transmission Grid
 - High Voltage Transmission
 - Medium Voltage Transmission
 - Low Voltage Transmission
- Forest Biomass Supply (Above-Bye) Areas
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- Other
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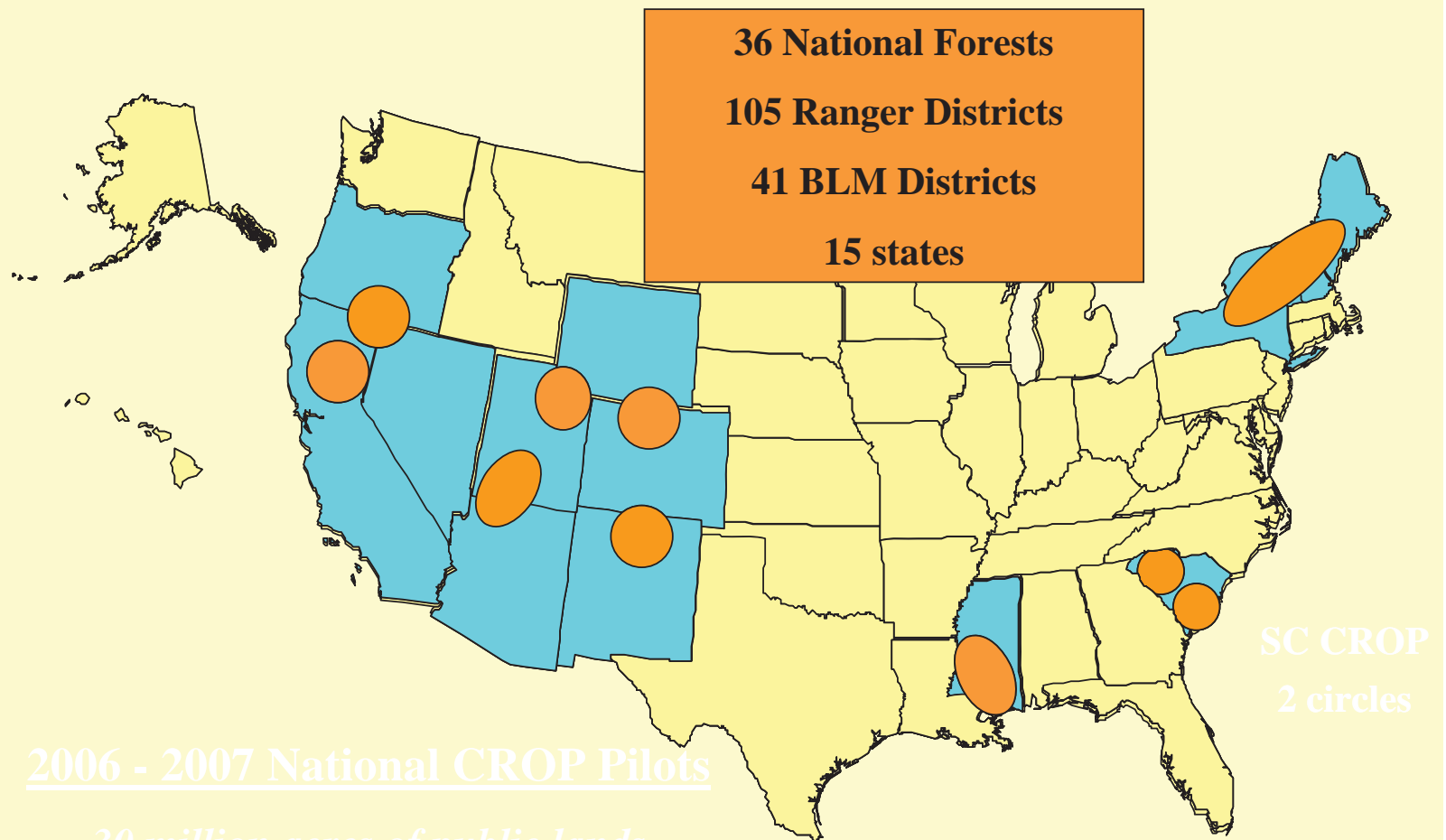


Forest Biomass Energy Opportunity Map
Oregon's Forest Biomass Supply, Existing Wood-Based Energy Facilities, and Power Transmission Grid



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Coordinated Resource Offering Protocol (CROP)



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Oregon Biomass Energy

78 Biomass Energy Facilities

- Wastewater, landfill, pellets, woody biomass
- 72 generate thermal energy
- 82% of all biomass energy used - industry
- 100 trillion British thermal units heat '07
- 430k tons of pellets (= 51 million therms of gas)

25 Generate Electricity

- 340 Megawatts connected Capacity
- 1,770 million kilowatt hours in '07
(= 170,000 homes @10,000 kwh each)



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Woody biomass energy

- 310 MW capacity
- 1,700 million kWh '07
- 27 trillion btu woody biomass thermal
- 35 trillion btu spent pulping liquor
- 1.6 Bone Dry Tons hogged fuel
- 2.7 million bone dry tons pulping solids



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Wood Densified Fuels

Five firms at seven sites

- 240,000 tons pellet/pressed log '05
- 4.5 trillion btu densified '05
- 320,000 ton of pellets/pressed log '07
- 6.0 trillion densified '07
- 500,000 ton per year capacity
 - Bear Mountain Forest Products
 - Blue Mountain
 - Western Oregon Wood Products
 - Kingsford
 - Klamath Fuel

New Woody Biomass Projects

Completed June '06 – June '08

- Douglas County Forest Products (3 MW)
- Biomass One Expansion (6 MW)
- Tillamook Lumber – Hampton (thermal)
- Rough and Ready Forest Products (2 MW)
- Feres Lumber (Evergreen Energy) (14 MW)
- BOISE LaGrande (thermal)

New Woody Biomass Projects

Pellet Manufacturing

- Bear Mountain Expansion 100k Tons
- Blue Mtn. Lumber Expansion 100k Tons
- Klamath Fuel 30k Tons
- West Oregon Wood Products 30k Tons

Commercial Institutional Heating

- Harney County Regional Hospital (pellets)
- Enterprise School District (biomass)

Proposed Biomass Projects by 2010

Biogas

- Eastern Oregon Dairy
- Medford Wastewater Treatment
- Gresham Wastewater Treatment
- Willow Lake Wastewater Treatment
- Rickreal Dairy

Commercial Institutional Heating

- Burns Catholic Diocese
- Klamath Falls School District

Proposed Biomass Projects by 2010

Woody Biomass

- Lakeview Generating (14 MW)
- Warm Springs (20 MW)
- Ochoco Energy (14 MW)
- Heinze – Ontario (thermal)
- Seneca Eugene (thermal + 10 MW)

Pellet Manufacturing

- DR Johnson - Riddle 100k tons
- Western Oregon Wood Products – K Falls
- Bear Mountain – Burns

Business Energy Tax Credits



- ❑ Credit is 50% of cost – Renewables
 - ❑ Claimed at 10% per year for five years
- ❑ Credit is 35% of cost - Conservation, Recycling ...
 - ❑ Claimed at 10% for two, 5% for three years
- ❑ Equipment for forest recovery of biomass
- ❑ Woody biomass boilers and steam turbines
- ❑ Manufacturers of renewable resource equipment



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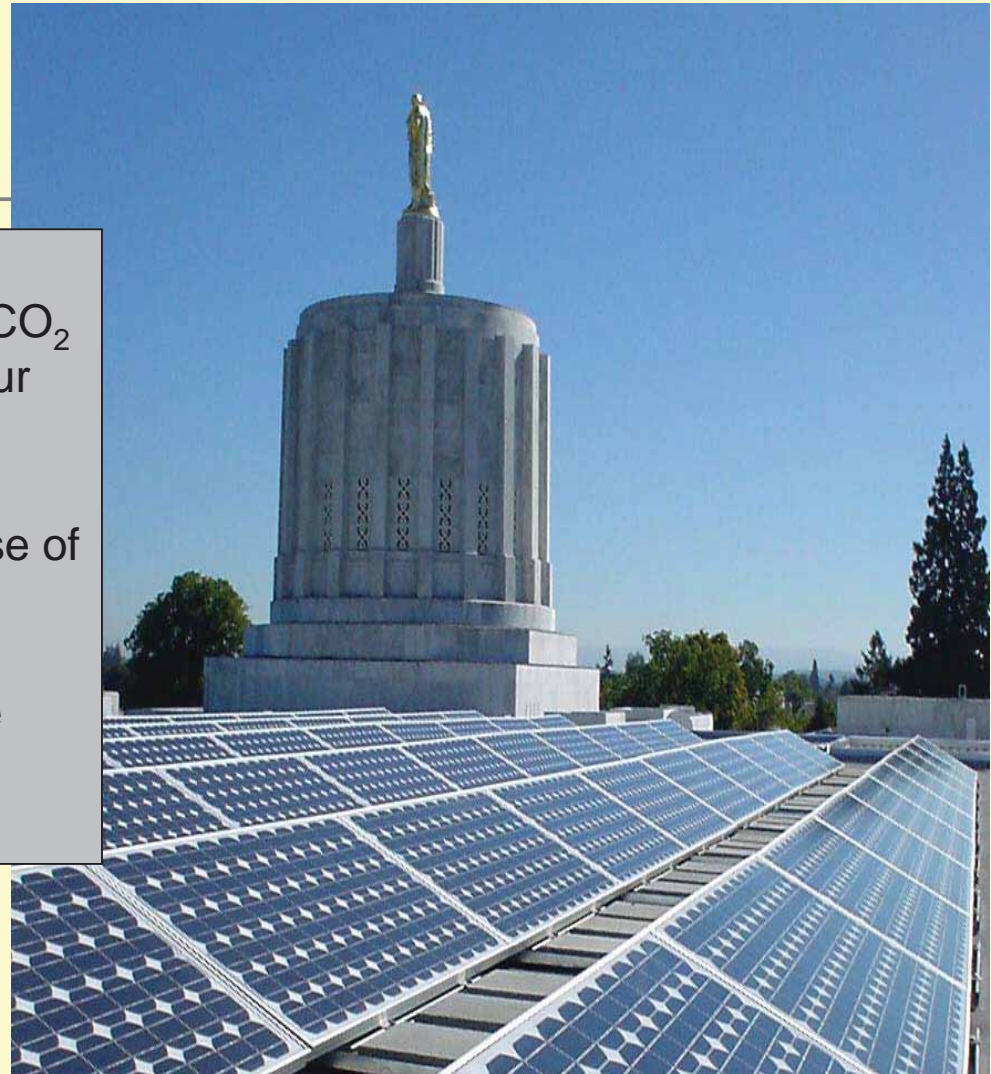
House Bill 2210 Bioenergy Credits

- ❑ For energy production in Oregon - \$10/ton
- ❑ Industrial residues or MSW not eligible
- ❑ Self-administered business income tax credit
- ❑ Retroactive to 1 January 2007



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- ◆ Based on Oregon's experience, we can limit CO₂ emissions and improve our economy.
- ◆ Education and efficient use of resources is essential.
- ◆ Renewable resources are Oregon's most prevalent and beneficial resources.



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