



WGA Biomass Task Force Regional Metrics Project

Bioenergy & Wood Products Conference

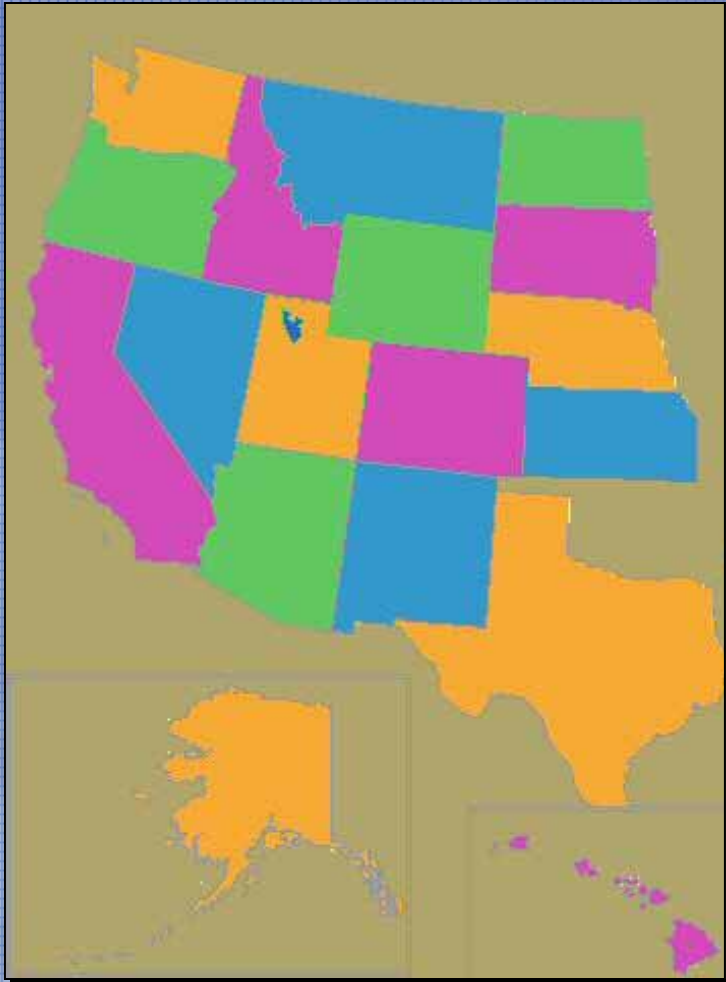
Presented by: Edward Gray

March 14, 2006



Western Governors' Association - CDEAC

Clean and Diversified Energy Advisory Committee



- Vision Statement:
Identify ways to increase the contribution of renewable energy, energy efficiency, and clean energy technologies within the context of the overall energy needs of the West
- Key Goal:
30,000 MW of clean energy in the West by 2015
(from solar, wind, geothermal, **biomass**, clean coal, advanced natural gas)

CDEAC - Biomass Task Force

- Determine biomass power generation cost and capacity achievable by 2015
→ 10,000 MW/yr @ 8¢/kWh from biomass by 2015
- Estimate location of lowest cost biomass and transmission costs
→ biomass is a distributed resource – power generation near end of transmission line will provide grid support and relieve strain on grid capacity
- Identify associated benefits & risks
→ environmental benefits worth \$8 billion/yr, plus additional economic and employment benefits

Biomass for Power and Fuel

- 72 million BDT/yr by 2015 from forest, agricultural, and urban resources
(Not currently used for higher value products)
- Could produce:
 - 10,000 MW baseload capacity ~ 6.5% power generation in the Western region
 - 6-7 billion gallons of Ethanol ~ 15% transportation fuel needs in Western region

Governor's Ethanol Coalition recommends:
8 billion gallons ethanol/yr by 2012*

**Current US Gasoline consumption - 140 billion gal/yr*

Western Biomass Resources and Technologies

FEEDSTOCKS

- Forest Resources
 - Unused logging slash
 - Primary mill residues
 - Forest fuels treatment biomass
 - Timberland
 - Other forest land
- Agricultural Resources
 - Crop Residues
 - Manure Biogas
 - Energy Crops
- Urban Resources
 - Biomass recovered from solid wastes
 - Biosolids
 - Landfill gas
 - Biogas from waste-water treatment plants

POWER Technologies

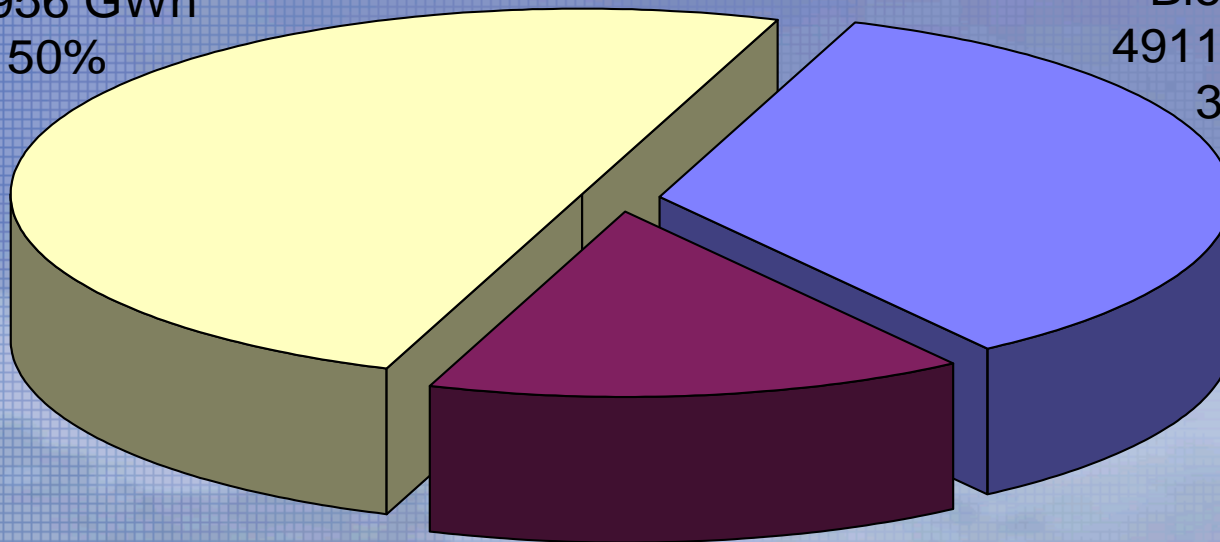
- Direct Fired/Steam Turbine
- Biomass Cofired in Fossil Fuel Power Plants
- Gasifier/IC Engine
- Gasifier/Combined Cycle
- Gasifier/Gas turbine and cogeneration
- Biogas IC Engines and Microturbines
- Biogas Fuel Cells

Biomass Resources by 2015

Forest
Resources
70,956 GWh
50%

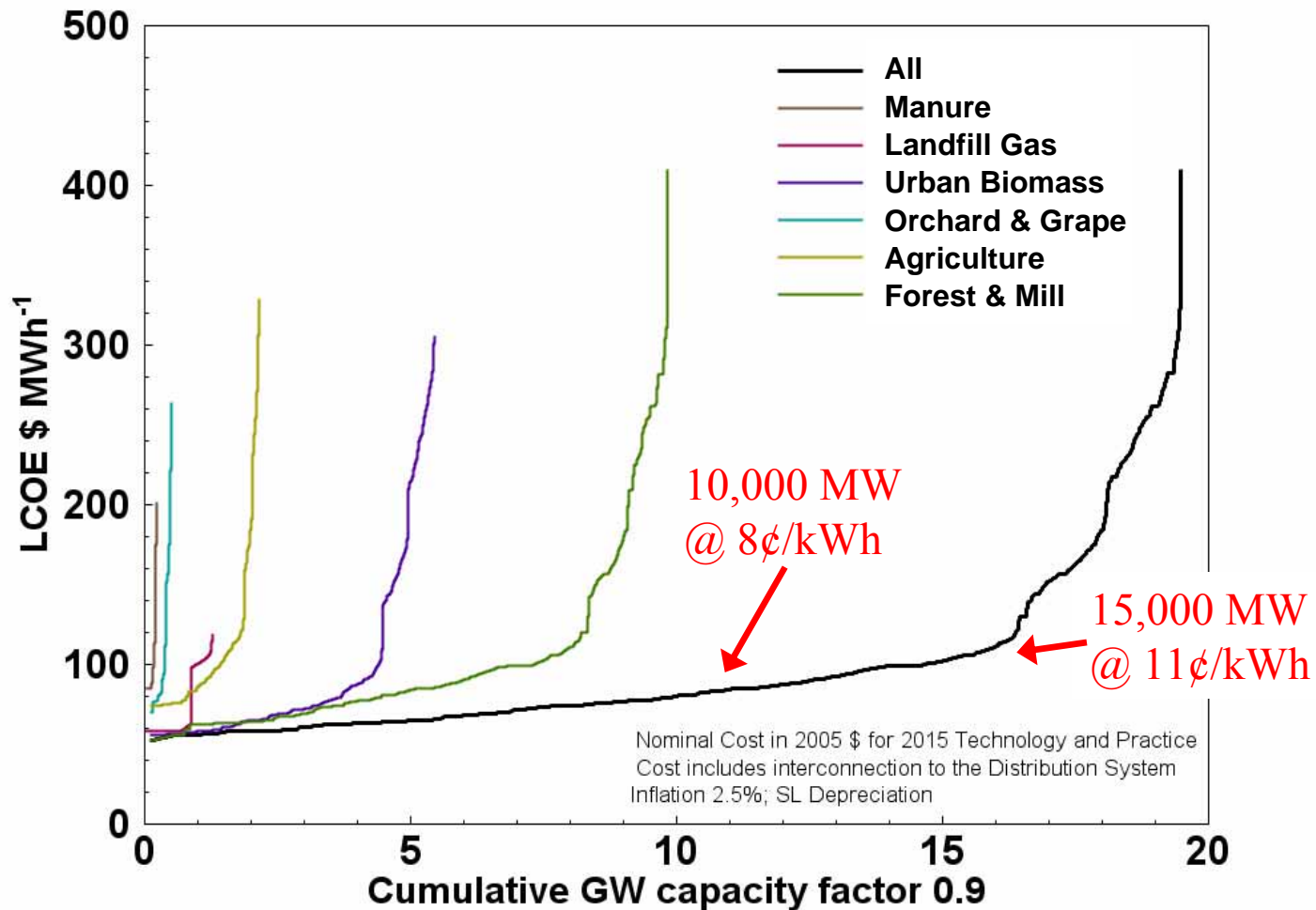
Urban
Biomass
49,117 GWh
35%

Agriculture
21,681 GWh
15%

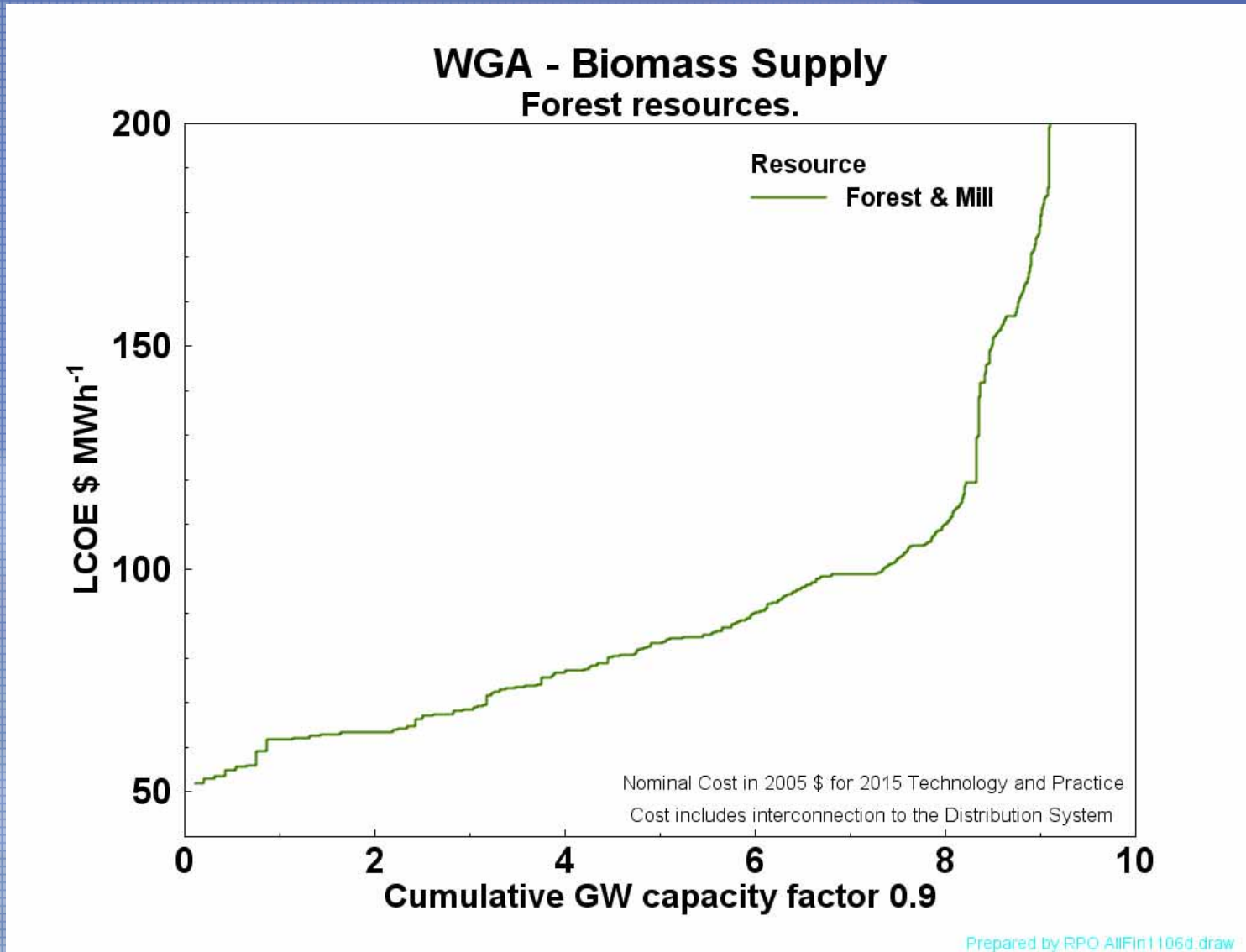


Biomass Fuel Supply – Cumulative

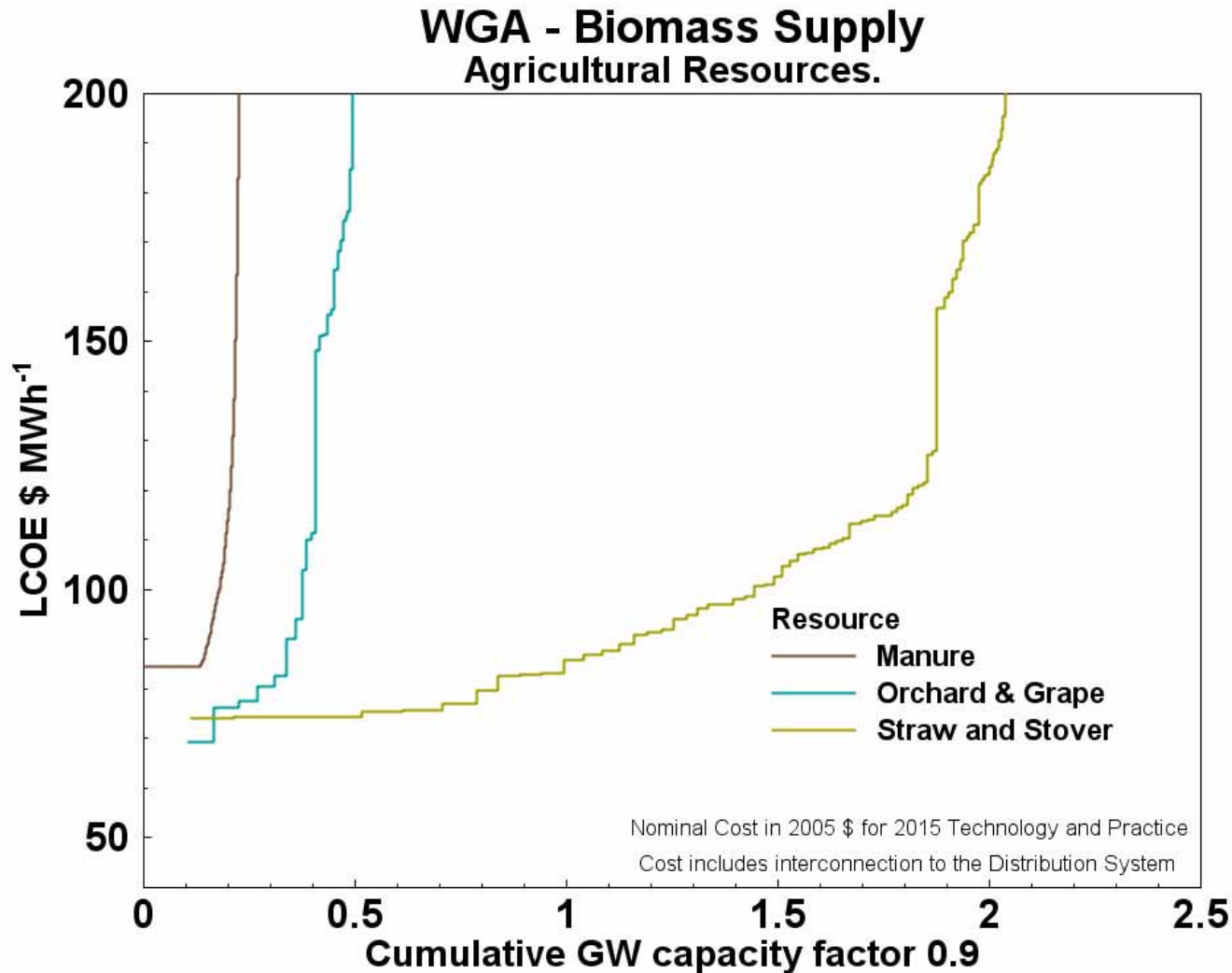
WGA - Biomass Supply



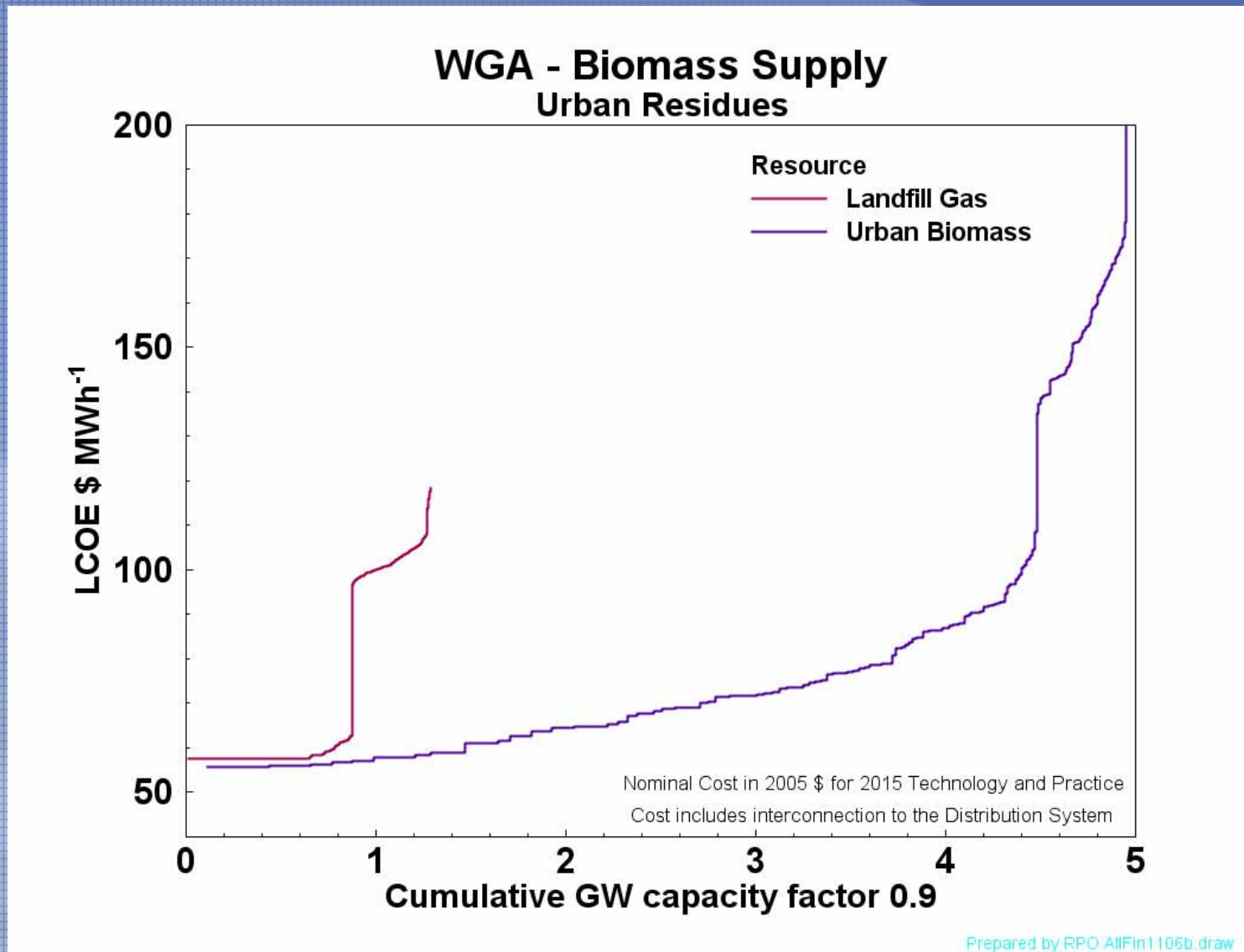
Biomass Fuel Supply – Forest



Biomass Fuel Supply – Agricultural

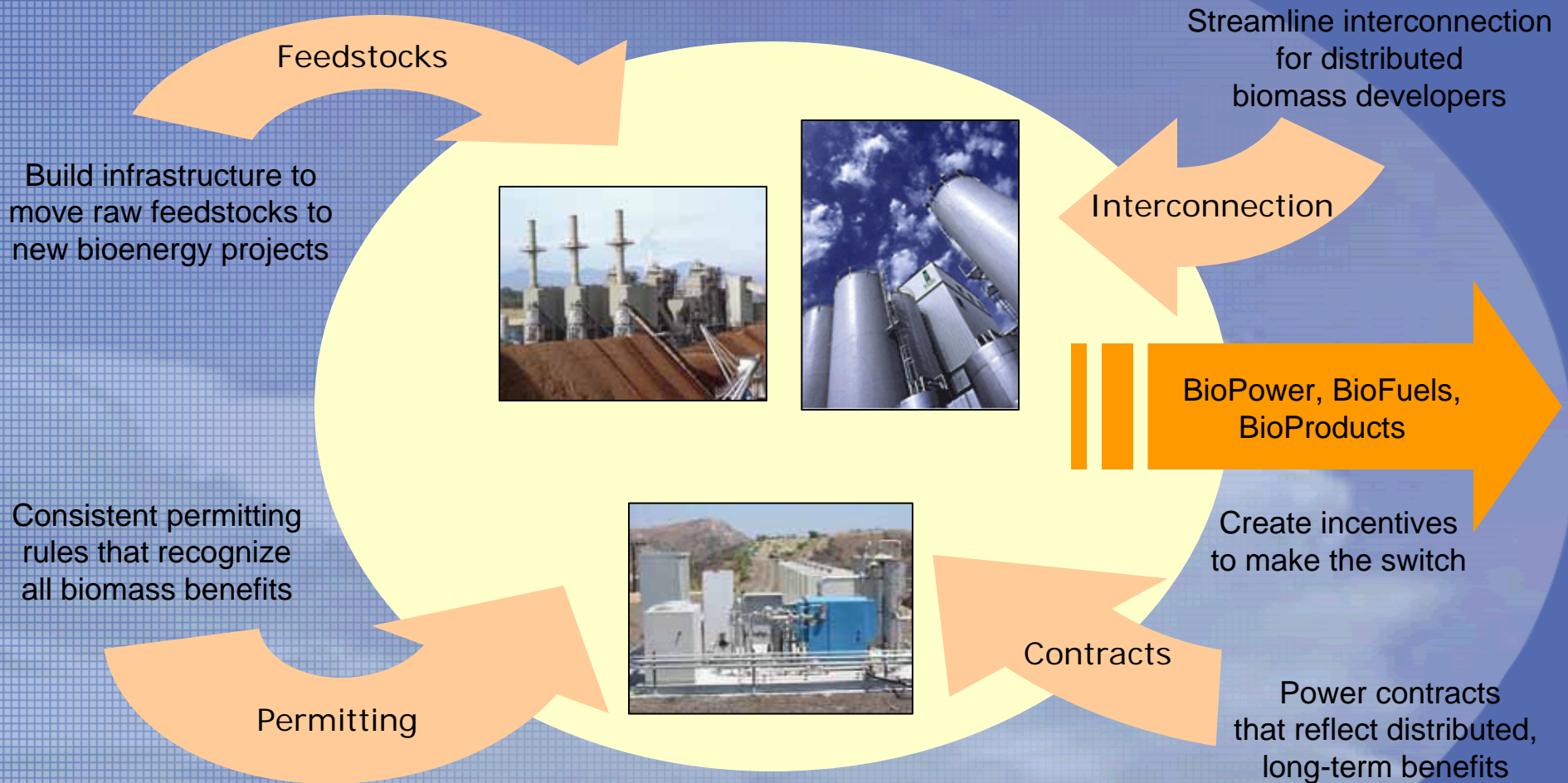


Biomass Fuel Supply – Urban



Biomass to Markets

Creating an Environment Conducive to Bioenergy Development



Biomass to Markets

Reaping the Benefits

- Reduced fire risk
- Carbon emissions reduction

Feedstocks

- Diversion from LF & WWT
- Landfill/manure to products
- Rural Development
- Improved forest health



- Reduced transmission strain
- Baseload dispatchable energy source
- Reliable supply

Interconnection

- Reduced emissions & noxious odors
- Local air and water quality improvements
- Improved watershed production and quality

BioPower, BioFuels, BioProducts

- Sustainable supplies of energy and goods

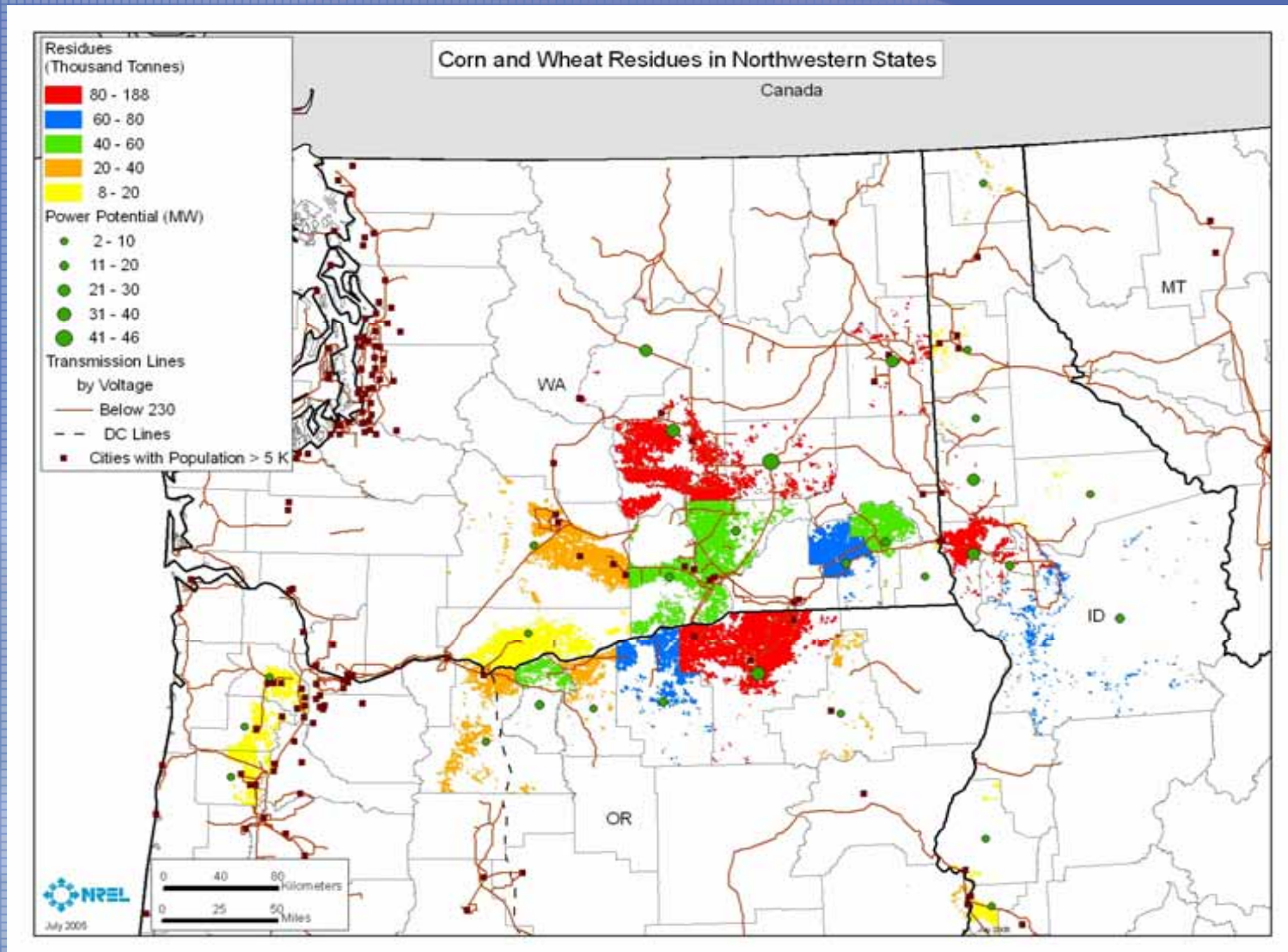
Permitting



Contracts

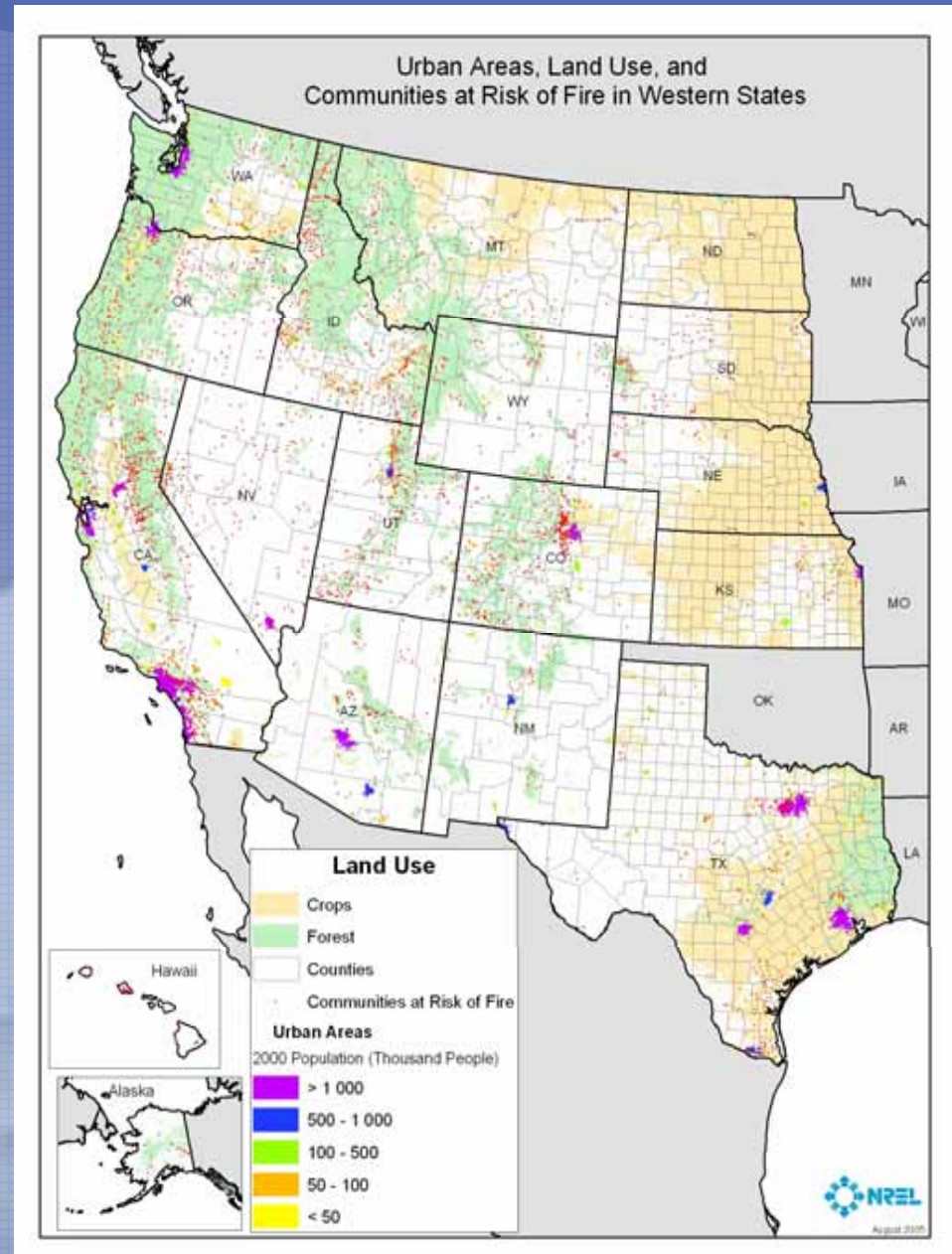
- Rural income and taxes
- Assured renewable supply
- Increased energy diversity and security

Biomass Resource Distribution

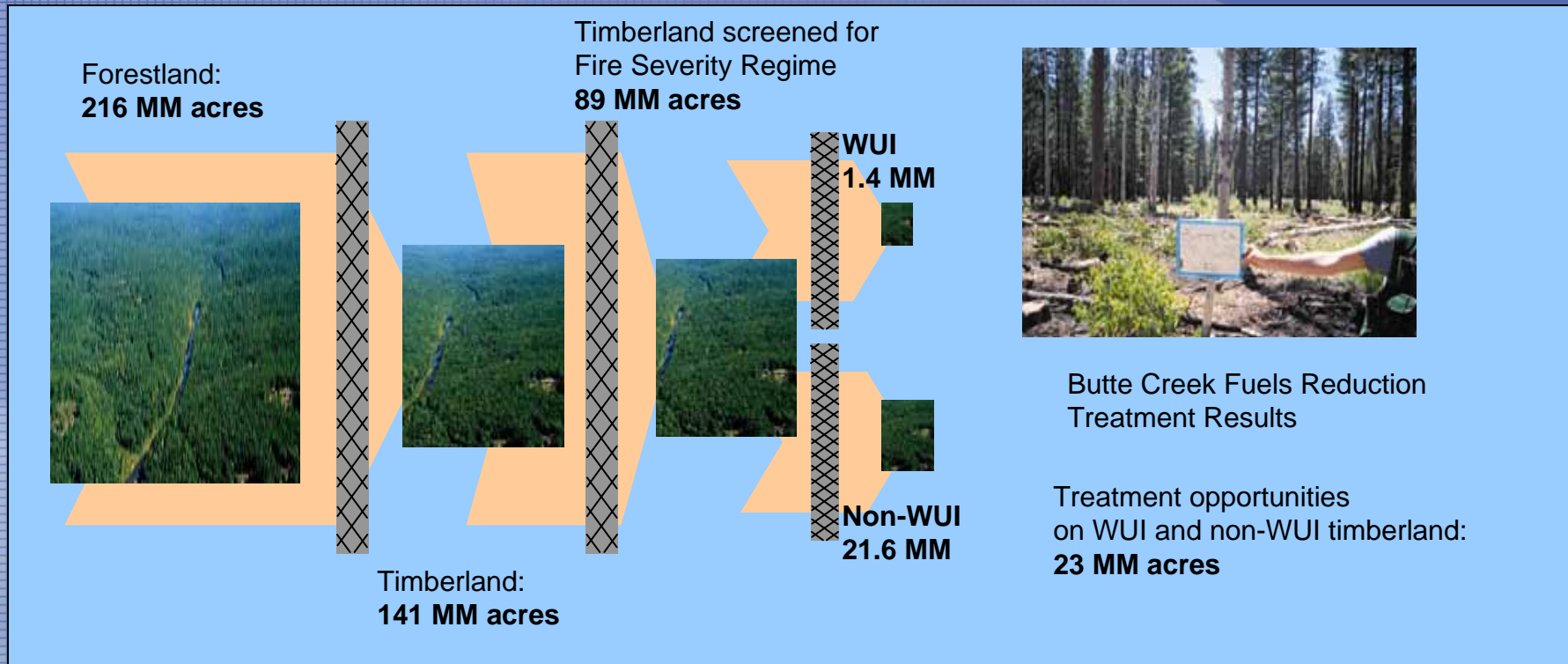


Synergies

- ✓ Fire Risk Reduction
- ✓ Rural Economic Growth And Preservation
- ✓ Distributed Resources
- ✓ Productive Use of Byproducts



Fire Risk Reduction Synergy



Fire Severity Regime Screens:

1. Forest type with a surface or mixed severity fire regimes
2. For WUI added limited treatment of high severity fire regimes

Final Screens:

1. Plots with higher fire hazard (CI < 25 mph or CI < 40 + TI < 25)
2. Inventoried roadless areas excluded
3. Counties with wetter climates excluded

WGA Task Force – Recommendations

1. Achieve Tax Parity Among Renewable Technologies
2. Strengthen Federal Land Management Policies To Allow Larger, Longer Restoration Projects
3. Environmental Benefits Of Biomass Should Be Paid For By Beneficiaries
4. Demonstrate State Government Leadership By Purchasing Power/RECs from Biomass Projects and by Supporting Biomass RD&D
5. Recognize Value of Firm Capacity in Renewable Purchase Programs

* Yellow Indicates Biomass Unique Recommendations

WGA Task Force – Recommendations

6. Renewable Energy Credits Should Not Include Ancillary Environmental Benefits
7. Establish a Single Definition of Biomass
8. Revise Utility Interconnection Policies
9. Provide Long-Term Certainty for Biomass Programs
10. Consider Avoided Fuel Based Emissions When Issuing Air Quality Permits

* Yellow Indicates Biomass Unique Recommendations

Unanswered Questions and Future Work

- What is the likely mix of products in 2015 and beyond
 - Power
 - Heat
 - Transportation fuels
 - Bio-based chemicals/products
- What integrated set of BioEnergy policies will achieve the greatest market penetration and regional benefits by 2015
- What is the most current monetary value of the benefits of biomass

Biomass Regional Partnership Metrics Project

- Measure impact of the Regional Biomass Partnerships in terms of acceptance and deployment of biomass technologies
- Methodology: Four Metrics
 - State Policies Favorable to Biomass
 - Increased BioEnergy Awareness
 - University curricula
 - Private or public training programs
 - Leveraging Federal Funding and State Resources
 - Increased BioEnergy Development Intensity
- All 5 regions investigated – West, Northwest, Great Lakes States, Southeast, Northeast

Metrics Project – Western Region

From 2003
to 2004

Investment
\$26 Million

Policy
Up 39%

Deployment
Up 13%

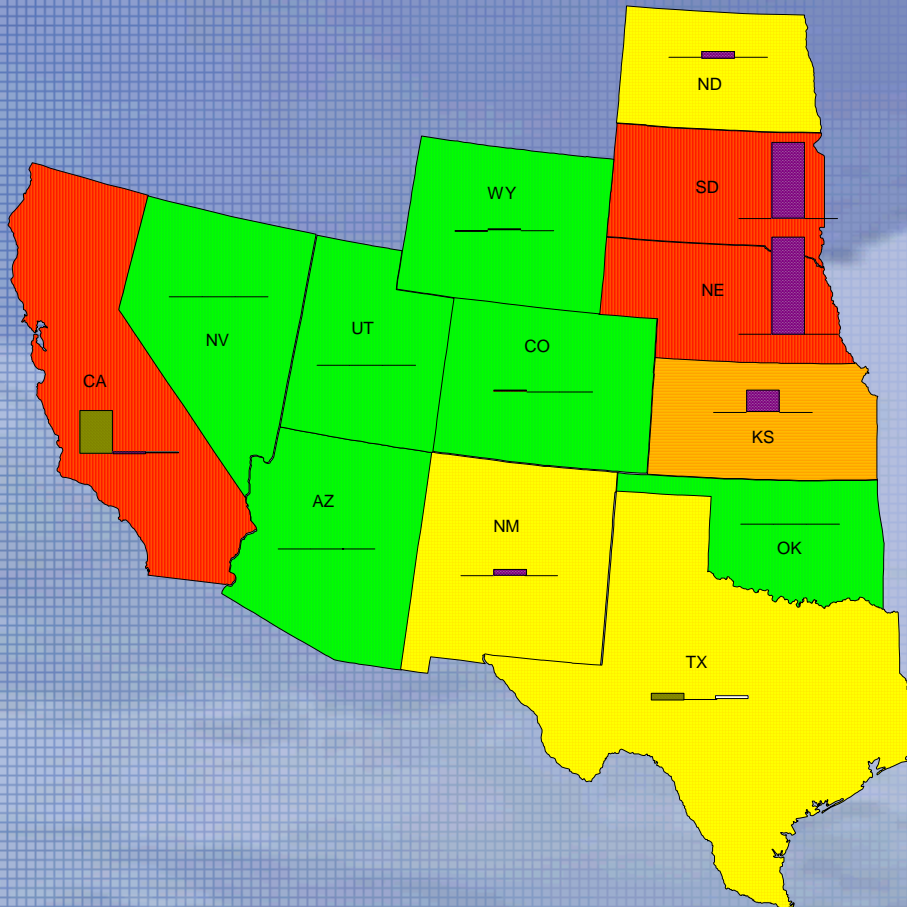
Outreach



Total Bioenergy Production

Western Biomass Partnership

2004 Total Bioenergy Production Capacity



Capacity (Billion Btu)

STATE SHADING:

- 0 to 2,000
- 2,000 to 5,000
- 5,000 to 10,000
- Over 10,000

BAR CHARTS:

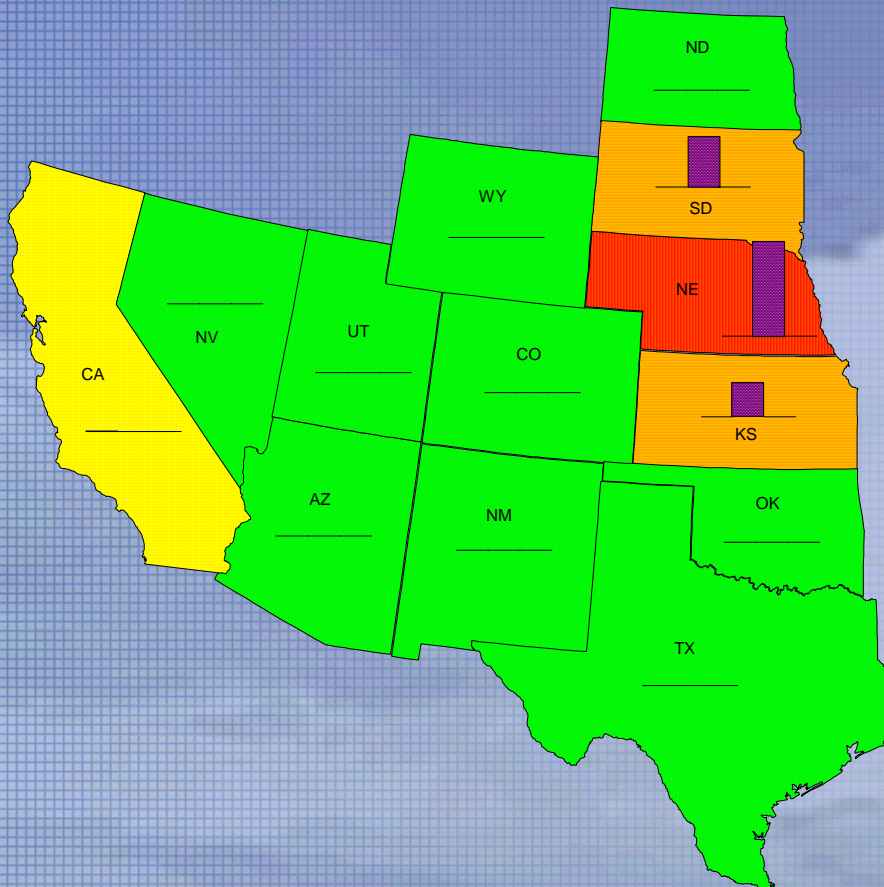
- Biopower
- Ethanol
- Biodiesel

State	Biopower	Ethanol	Biodiesel	Total
AZ	84	0	0	84
CA	17,014	833	309	18,156
CO	402	0	0	402
KS	26	8,516	0	8,542
NE	87	38,683	0	38,770
NV	0	0	0	0
NM	2	2,271	0	2,273
ND	0	2,650	0	2,650
OK	0	0	0	0
SD	0	30,166	0	30,166
TX	2,793	0	1,238	4,030
UT	44	0	0	44
WY	240	379	0	619
Total	20,693	83,497	1,547	105,737
US Total	163,834	264,341	12,186	440,361
% of Total	13%	32%	13%	24%

Change in Bioenergy Production

Western Biomass Partnership

2003 to 2004 Change in Bioenergy Production Capacity



Change in Capacity (Billion Btu)

STATE SHADING:

- 0
- 0 to 1,000
- 1,000 to 5,000
- Over 5,000

BAR CHARTS:

- Biopower
- Ethanol
- Biodiesel

State	Biopower	Ethanol	Biodiesel	Total
AZ	0	0	0	0
CA	28	0	0	28
CO	0	0	0	0
KS	0	2,271	0	2,271
NE	0	6,435	0	6,435
NV	0	0	0	0
NM	0	0	0	0
ND	0	0	0	0
OK	0	0	0	0
SD	0	3,407	0	3,407
TX	0	0	0	0
UT	0	0	0	0
WY	0	0	0	0
Total	28	12,112	0	12,140
US Total	900	33,687	4,704	39,290
% of Total	3%	36%	0%	31%

Please visit the WGA website
for more information:

www.westgov.org