Mr. Kingsley serves as vice president of Innovative Natural Resource Solutions LLC (INRS), a natural resource industries consulting firm with offices in New Hampshire and Maine. He has a Master's Degree in Resource Economics from the University of New Hampshire, and served for five years as executive director of the New Hampshire Timberland Owners Association, a trade association representing all sectors of that state's forest industry.

Since joining INRS in 2000, he has led dozens of projects, including research on new markets for low-grade wood, new market development for sawmills and paper mills , and he has worked with a number of parties on the development of new biomass energy facilities in New England and around the country. He led the firm's efforts on the Maine Future Forest Economy Project, a comprehensive analysis of Maine's forest products manufacturing sector completed for the Maine Department of Conservation and the Maine Technology Institute. He served as a lead consultant for Public Service of New Hampshire in that firm's replacement of a 50 MW coal-fired unit with the country's largest new biomass plant.

Currently Mr. Kingsley is working with developers of biomass or biofuels projects in Maine, New Hampshire, New York, New Jersey, Vermont Massachusetts, Illinois and Michigan. Please welcome Eric Kingsley.....

Building the Forest Bioproducts Industry in the Northeast:
Finding the Combinations that Fit

18 October 2007

Eric Kingsley

Innovative Natural Resource Solutions LLC

U.S. Dependence on Foreign Oil

Have Oil		Use Oil	
Saudi Arabia	26%	U.S.	26%
Iraq	11%	Japan	7%
Kuwait	10%	China	6%
Iran	9%	Germany	4%
UAE	8%	Russia	3%
Venezuela	6%	S. Korea	3%
Russia	5%	France	3%
Mexico	3%	Italy	3%
Libya	3%	Mexico	3%
China	3%	Brazil	3%
Nigeria	2%	Canada	3%
U.S.	2%	India	3%

The U.S. uses more than the next 5 highest consuming nations combined.

Updated August 2002
Source: International Energy Annual 1999 (EIA), Tables 1.2 and 8.1.

When a developer looks, what do they look for?

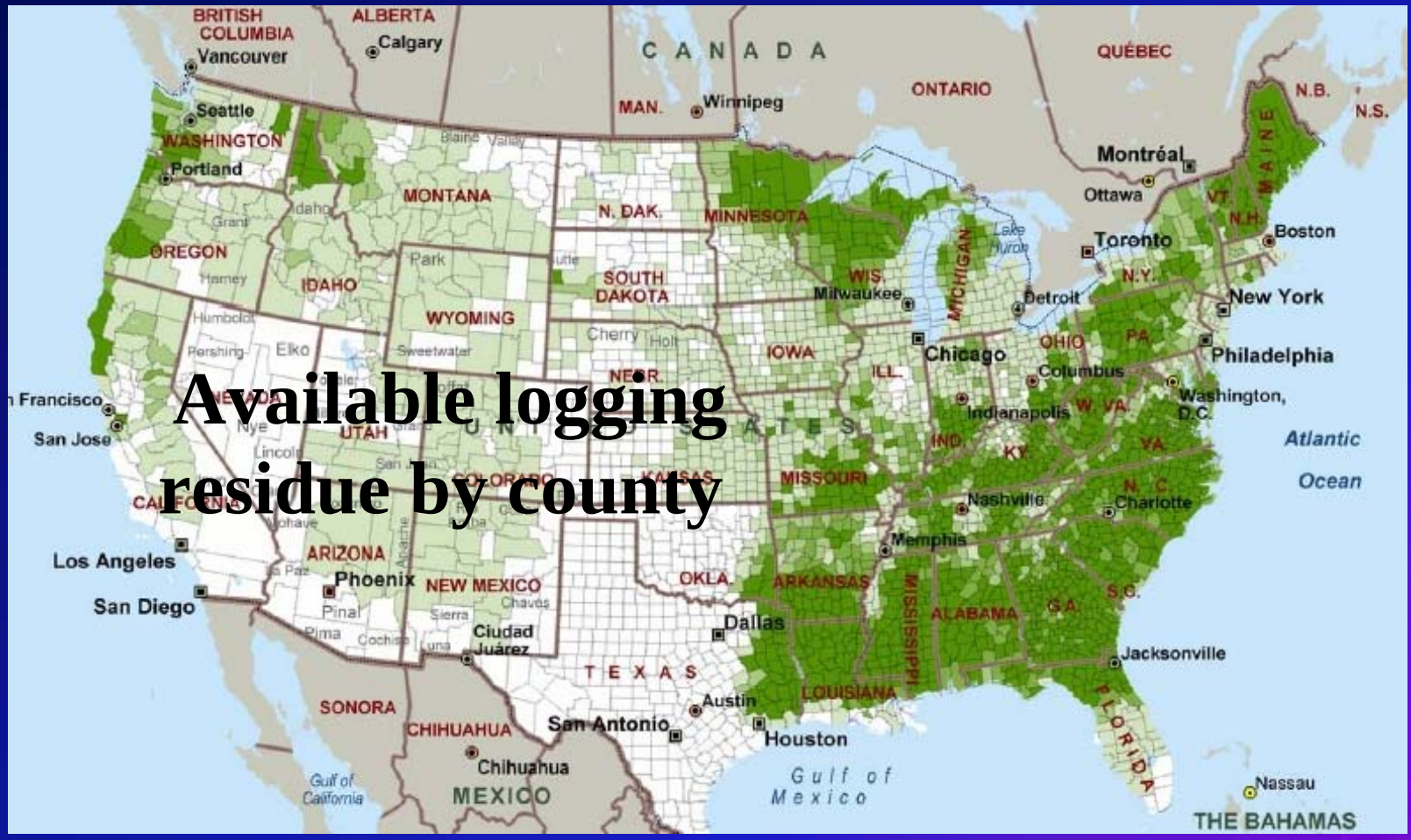
- Wood Supply
  - Competing Uses
- Public Policy (including $$)
- Access to Market
- Workforce
- Energy Costs
- Permitting Speed

Wood Supply

Wood Supply is a Critical Piece of Biomass Projects

- Can represent ~80% of operating costs
- No transparent market, no futures market
- A disconnected supply chain (landowner, loggers, truckers)
- A belief on the part of suppliers that prices *will* go up, and a reluctance commit to pricing
- Inability of suppliers to accurately forecast and hedge their price structure
- Suppliers are small and don't meet institutional credit guidelines

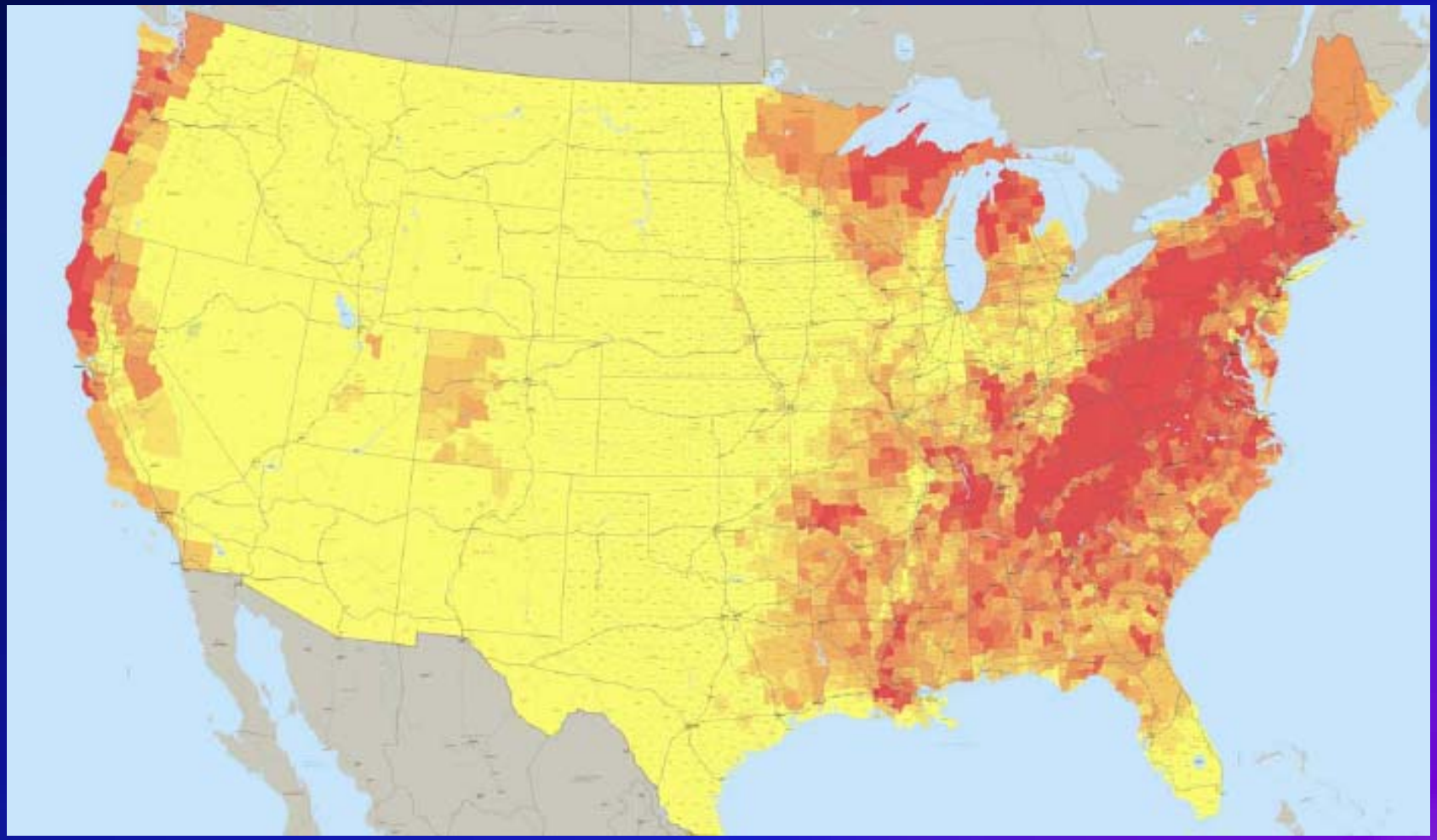
We Have A Lot of Wood



A true but not unique statement.

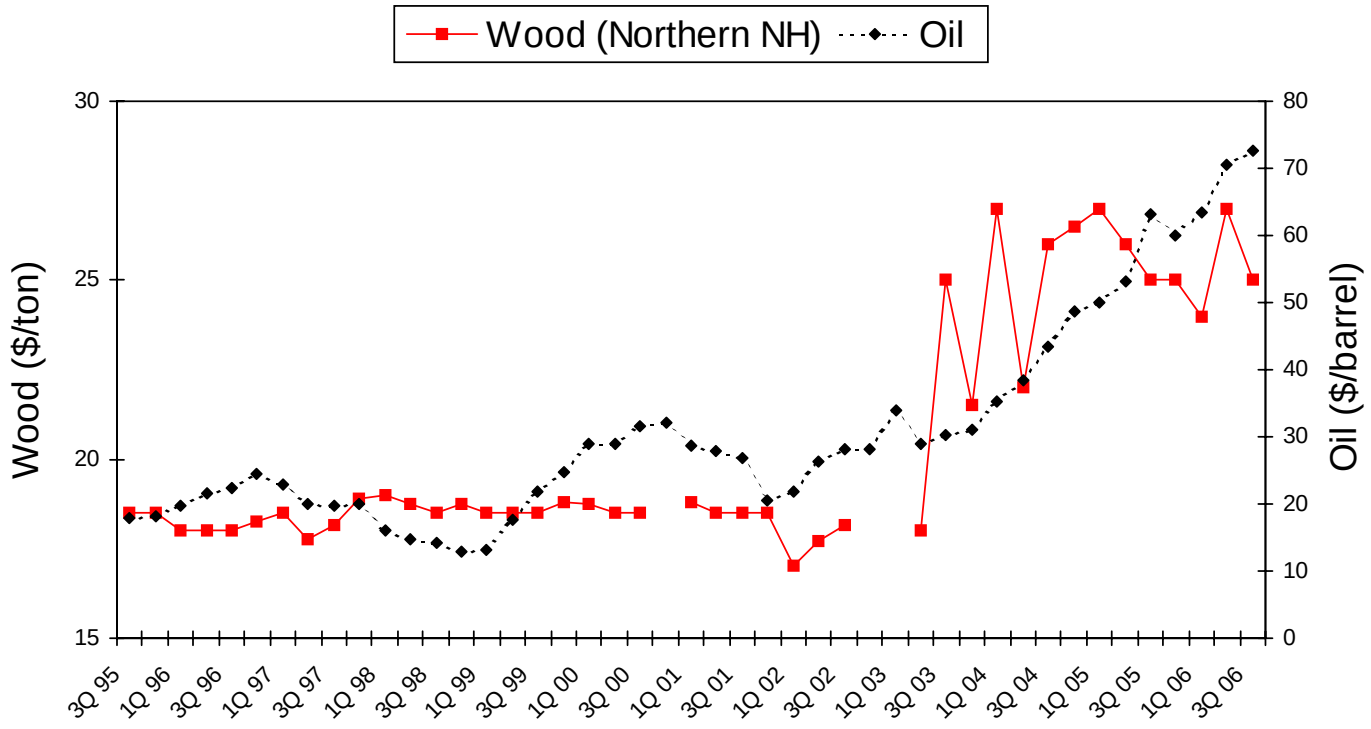

We also have a lot of low-grade wood users
• Biomass
•Pulp
•Oriented Strand Board
Québec
NEW BRUNSWICK
Montréal
Ottawa
VERMONT
MAINE
Bay of Fundy
NEW HAMPSHIRE
Manchester
MASSACHUSETTS
Boston
Worcester
Springfield
Providence
CONNECTICUT
Waterbury
R.I.
Gulf of Maine
Green area indicates drive time
• 2 minutes per MW
•120 minutes pulp mill
•60 minutes OSB

For technologies requiring hardwoods, the “target rich” areas start near the NH border and go through TN



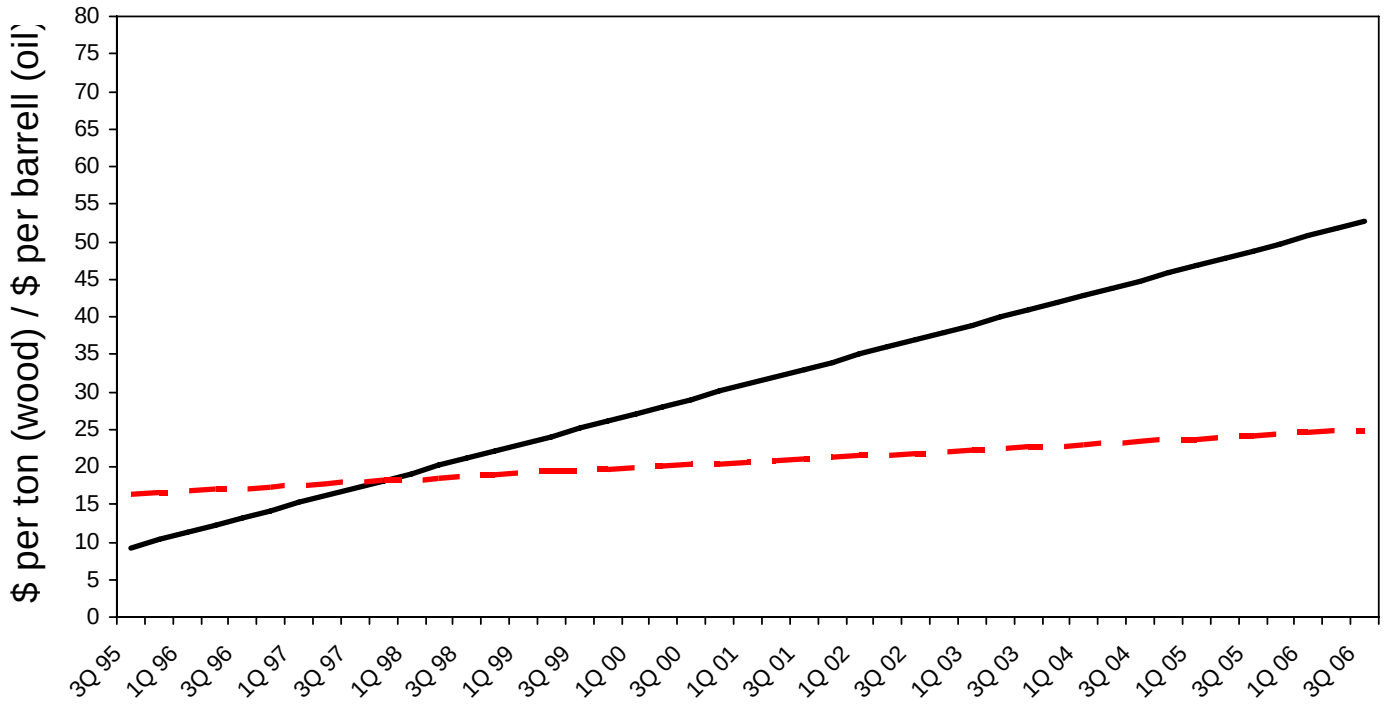
Hardwood density by county

Wood and Oil Prices, 1995 – 2006



Data Sources: *NHTOA Timber Crier, US DOE Energy Information Agency*

Wood and Oil Prices , Trend Line 1995 – 2006



Data Sources: *NHTOA Timber Crier, US DOE Energy Information Agency*

1 Green Ton of Wood

1 truck = ~30 green tons

- 0.6 MWH of electricity

- 40 gallons of ethanol

Feedstock Costs

Wood Cost (Delivered)	Electricity ($ per kwh)	Ethanol ($ per gallon)
$ 10	$ 0.017	$ 0.25
$ 20	$ 0.034	$ 0.50
$ 30	$ 0.051	$ 0.75
$ 40	$ 0.068	$ 1.00
$ 50	$ 0.085	$ 1.25

Does not include operations & maintenance, debt service, profit

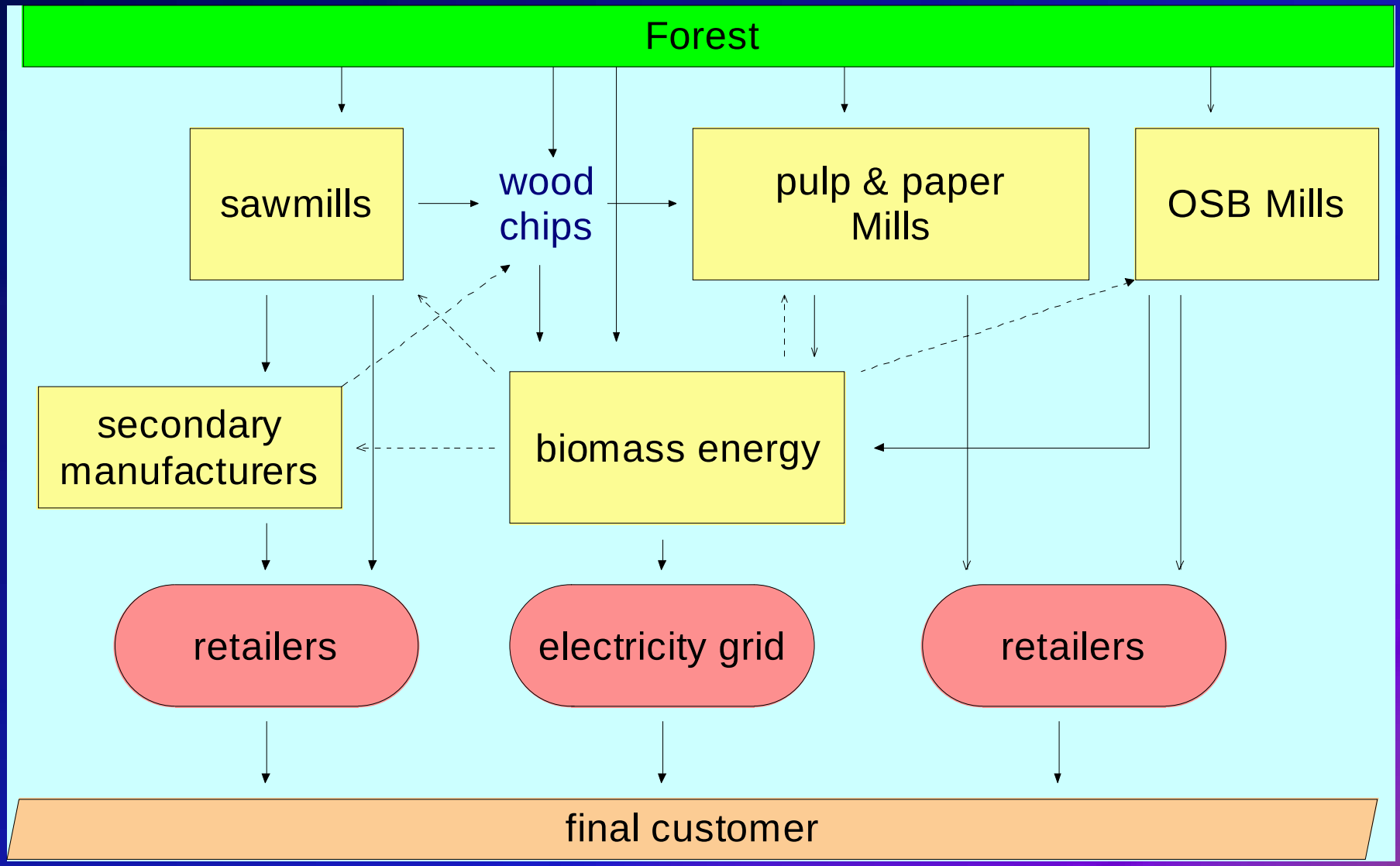
Electricity ~ $0.055, Tuesday's CBOT Ethanol $1.61

Feedstock Costs

- "I can see cellulosic fuels sinking to $1 per gallon in ten years."
  - Vinod Khosla, Khosla Ventures
- Assuming 80 gallons per dry ton of feedstock, that puts delivered wood costs around $30 per green ton. ($0.75 / gallon)
- Is this economic level enough to support increased harvesting activity? What specs?
- Probably adds support to processes with valuable co-products

Industrial Infrastructure

The existing forest industry has a known dynamic – Where does a biorefinery fit in?



Existing Industry

Strengths

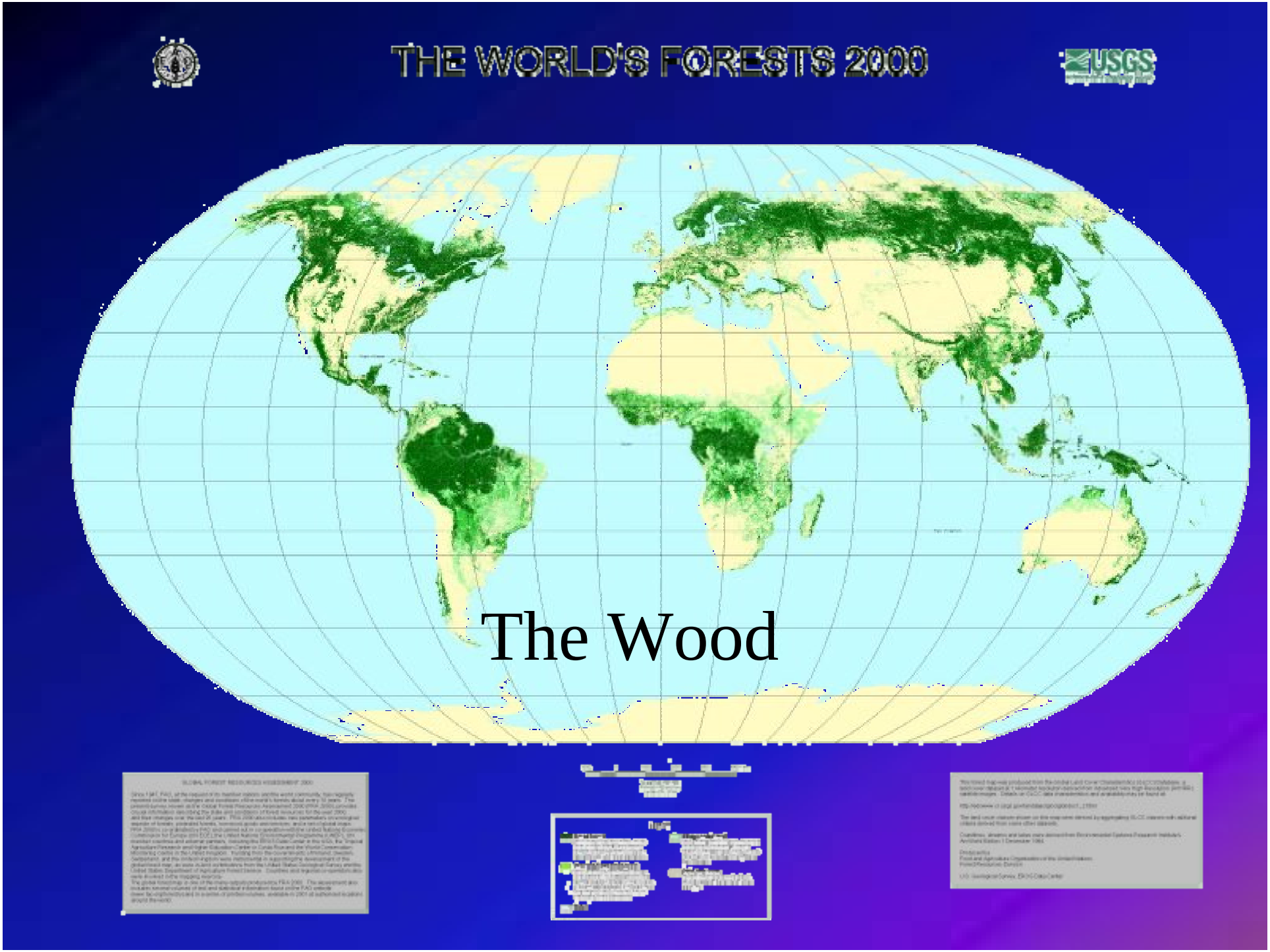
- Existing loggers and forestry expertise
- Existing equipment for harvesting and transport
- Large landowners (big +)
- Private road network
- Mills with labor, heat, steam, space, WWTF, and permits

Challenges

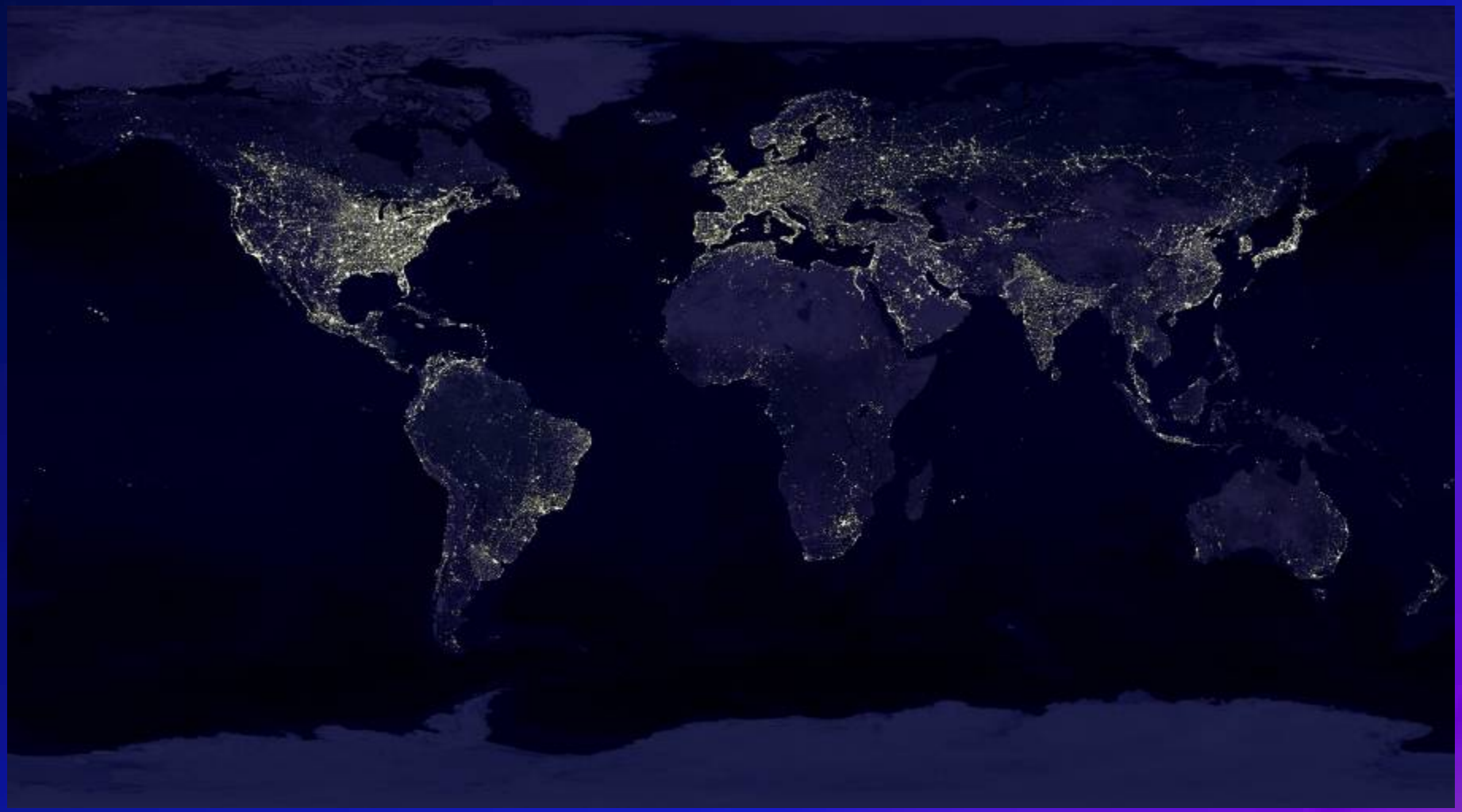
- Most wood has a home
  - Some wood has long-term commitments to certain buyers
- Prices for biomass are pushing the limits of current conversion technology
- Are products competing with an existing user?
- All existing industry challenges

Feedstock transport, handling and storage are important parts of industry success

Access to Markets

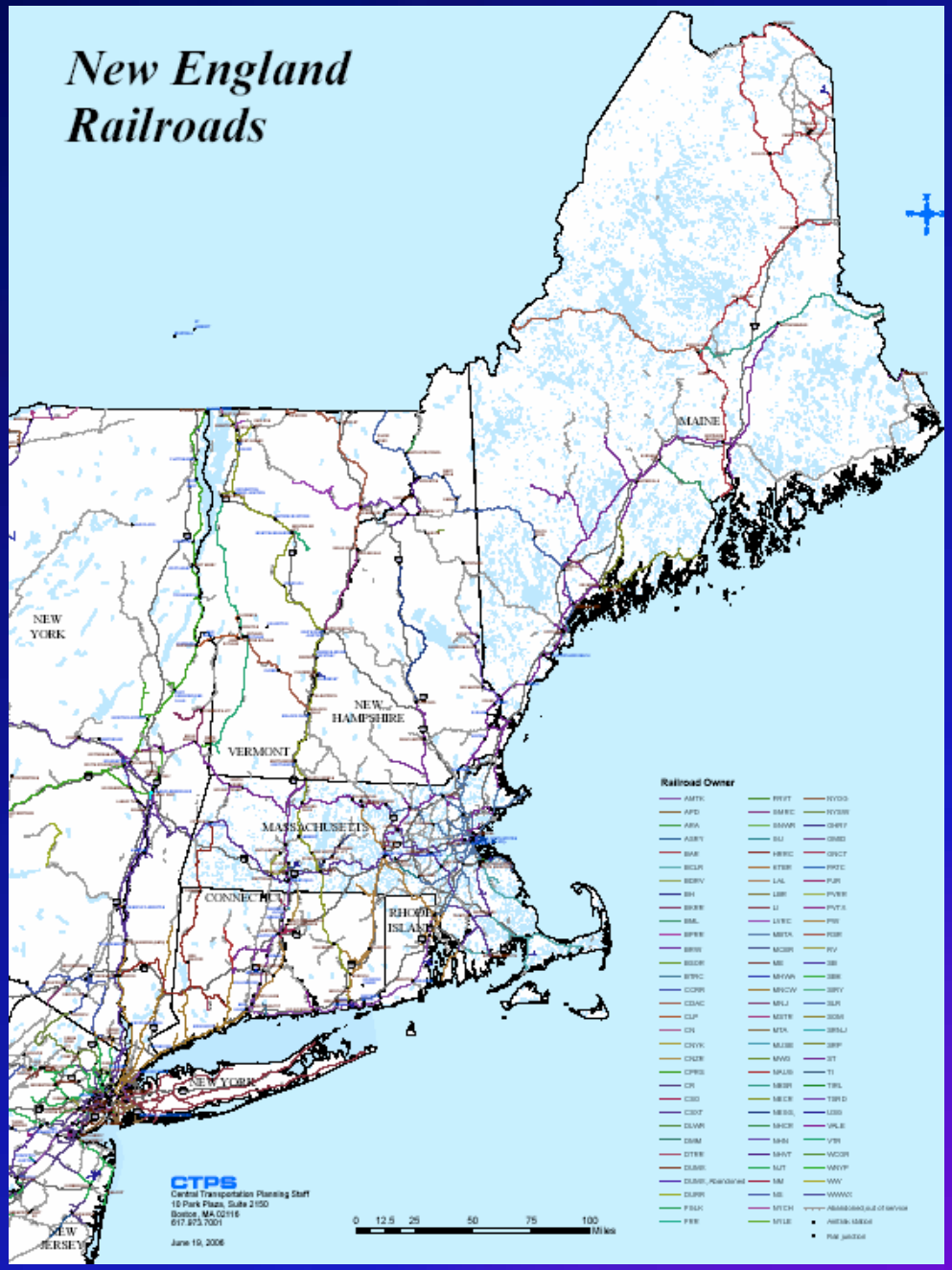

THE WORLD'S FORESTS 2000
USGS
The Wood

The Markets



Existing Ethanol Plants Move Product by Rail And Have Room for 100+ Rail Cars

Ethanol Moves by “Unit Trains”
100 + Rail Cars


New England
Railroads
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NEW
YORK
NEW
HAMPSHIRE
VERMONT
MASSACHUSETTS
CONNECTICUT
RHODE
ISLAND
NEW YORK
NEW
JERSEY
Railroad Owner
CTPS
Central Transportation Planning Staff
10 Park Plaza, Suite 2150
Boston, MA 02116
617.973.7001
June 19, 2006
0 12.5 25 50 75 100
Miles


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National Capital
State & Provincial Capital
Railway Network
International Boundary
State & Provincial Boundary
Map not to Scale
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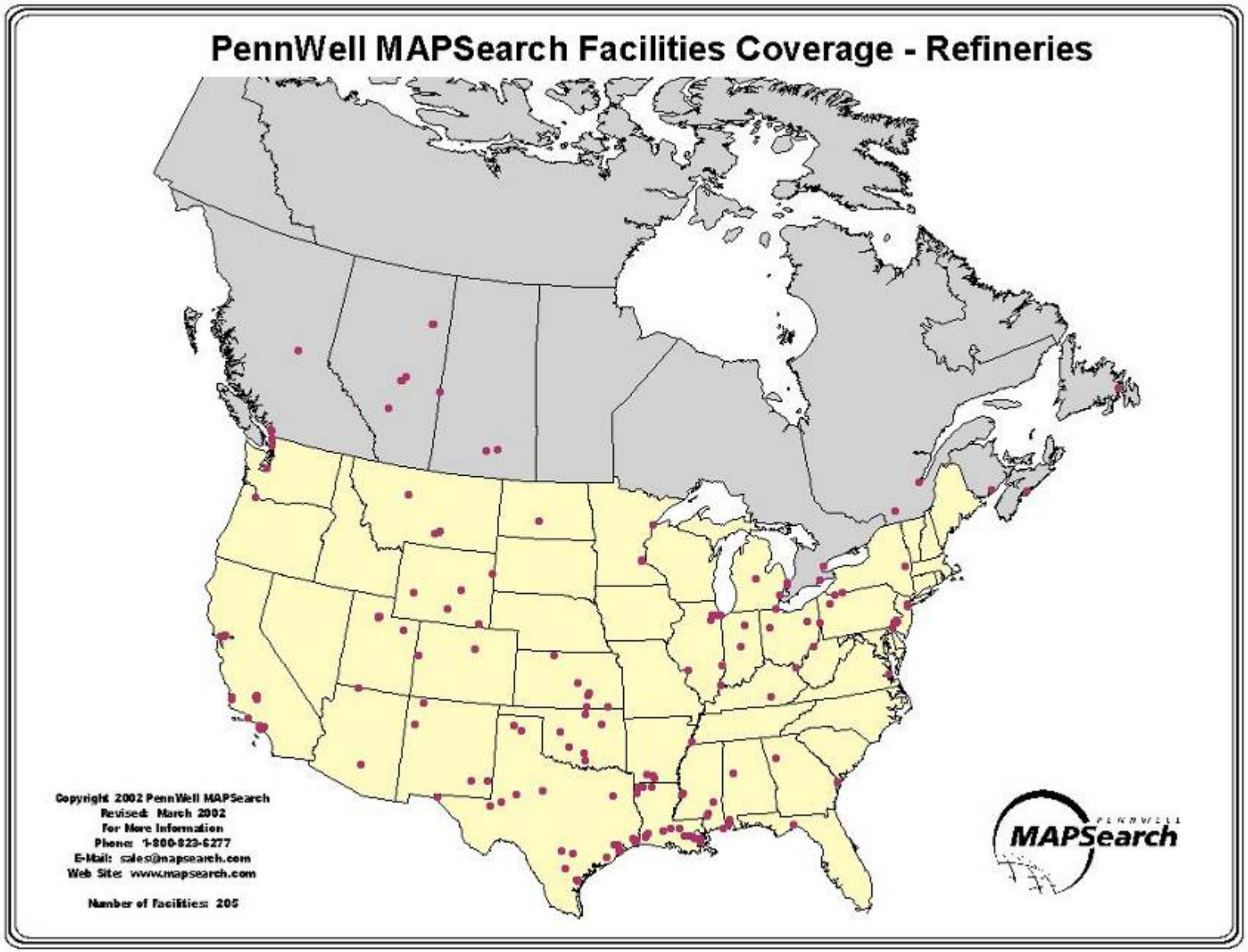
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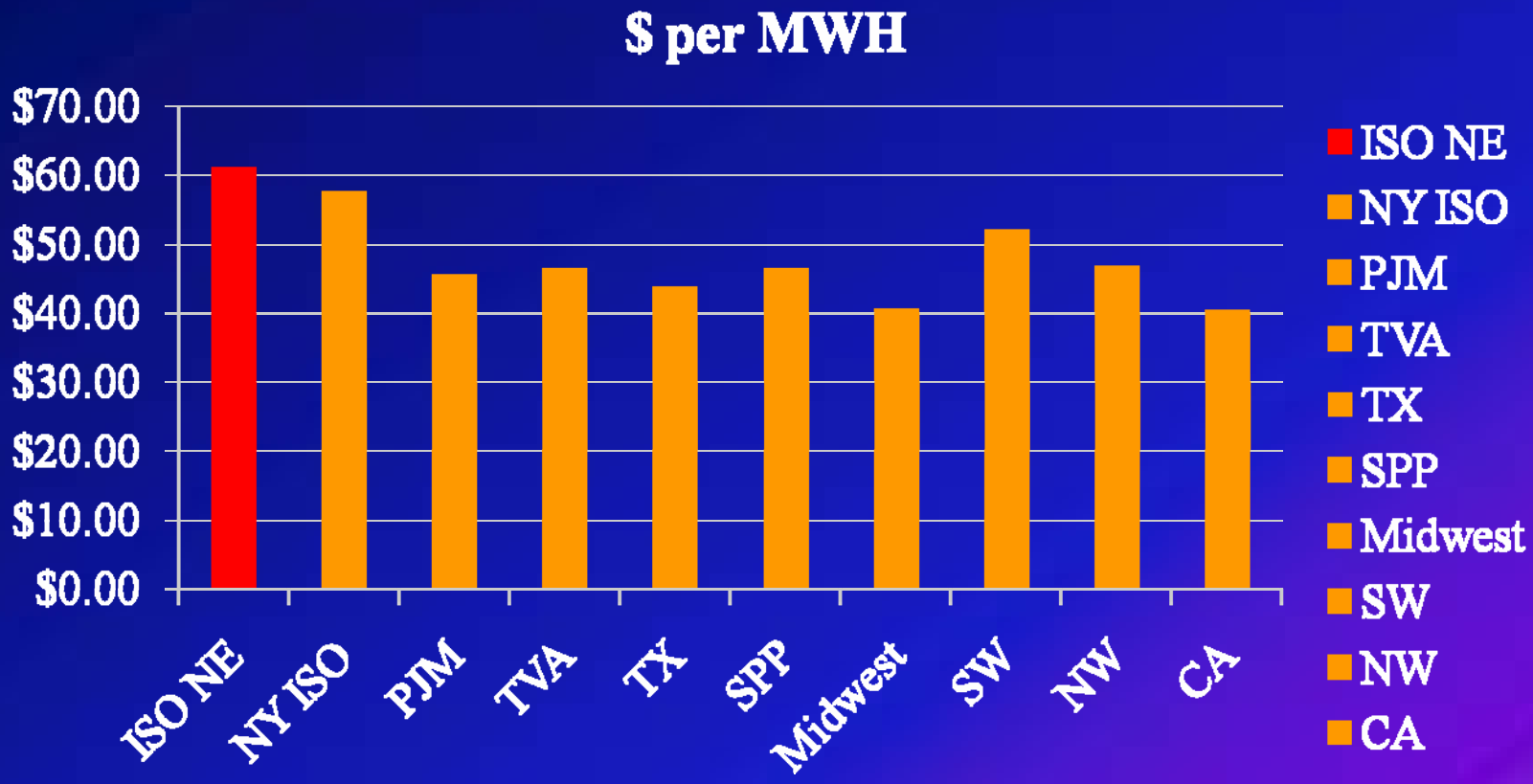
Cost of Power

Cost of Electricity in the Region is Higher than Most Other Places

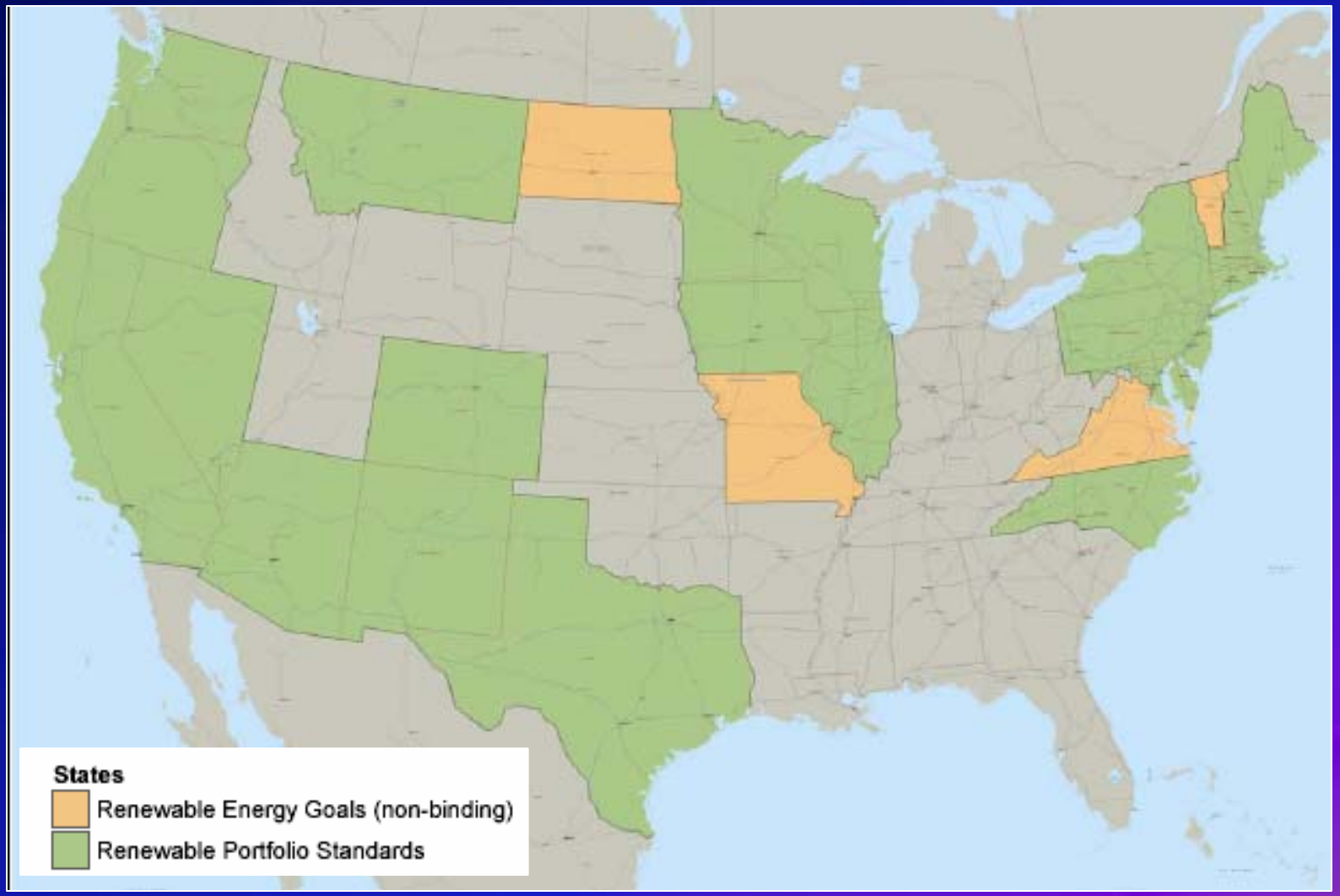
- This is an issue that can cut both ways for bioproduct facilities
  - For large users of electricity, heat and steam, this can be an added cost
  - For facilities that have electricity as a product, co-product or byproduct, this is an opportunity
  - Some product substitutes, such as bioproducts that can be used as home heating oil, may do very well here and poorly in other places

Average Wholesale Electricity Price, Past 4 Years



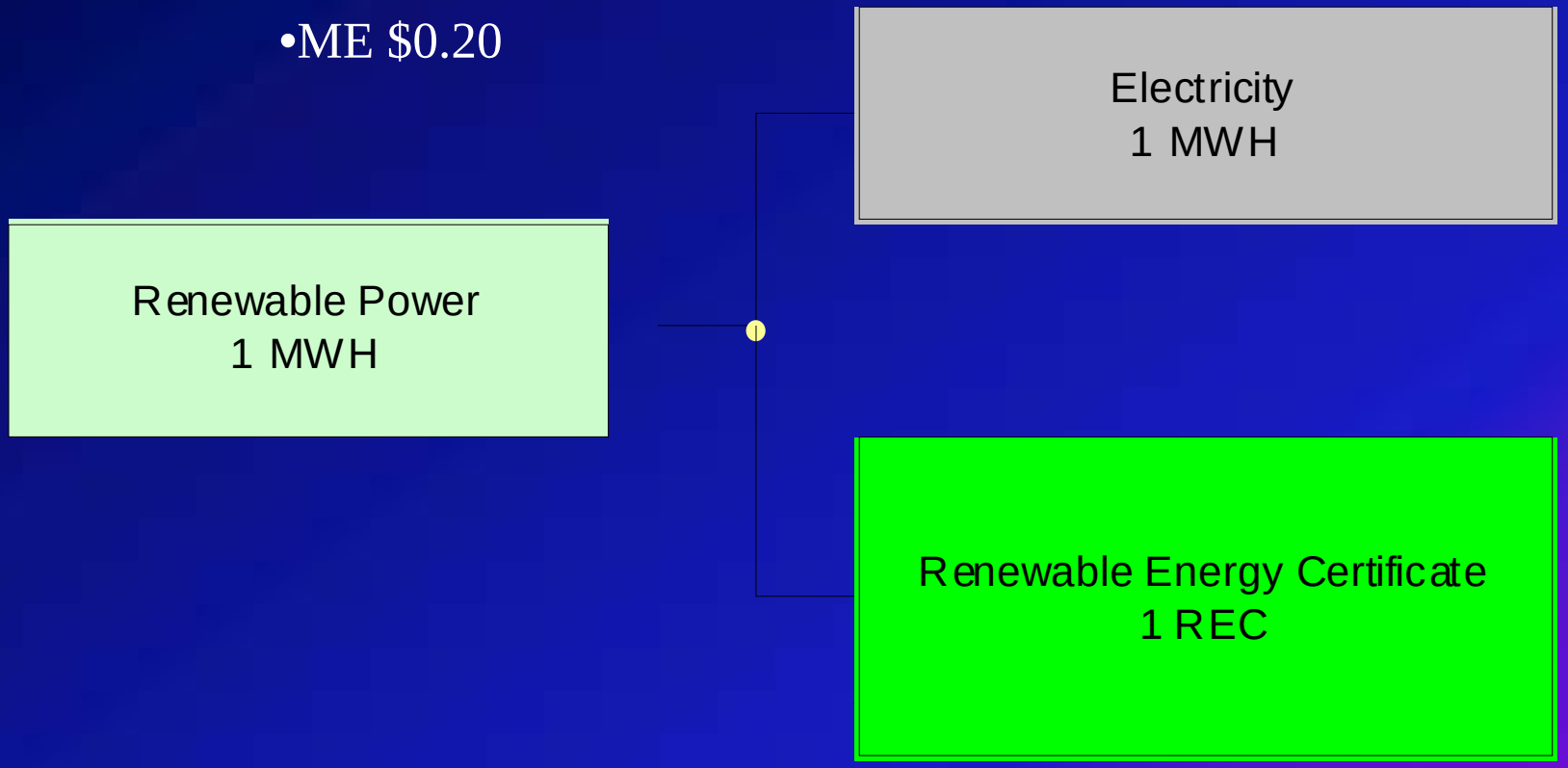
Note: Does not account for transmission, distribution, or societal costs

States Are Increasingly Demanding Electricity Generation from Renewable Sources



RECs can Add Real Value to a Project

- MA $54.75
- CT Class 1 $$54.00
- RI $48.00
- ME $0.20



Public Policy Support

- All states claim to want biofuel facilities
- Some states express their desires with money, and lots of it
- What Northeastern states have the money to compete at this point, and should they?
- $20 million in NY for two projects
- ~$6 million in GA for one project (tobacco $)
- TN putting $$ into switchgrass >> ethanol facility
- Idaho trying to lure Iogen from Canada
- PA just announced $10 million in biofuel funding

Speed of Permitting

- At this point, cellulosic ethanol is very much a race. Every technology wants to demonstrate commercial success TODAY
  - Speed of permitting is a clear developer criteria, likelihood of success important
- Example: Range Fuel facility in Georgia (20 MMGPY >> 100 MMGPY)
  - Announced on February 7, 2007
  - Fully permitted July 2, 2007
  - 115 days from announced to permitted

Carbon, Carbon, Carbon

- Carbon is THE coming issue in renewable fuel development
  - US currently has no mandatory carbon reduction protocol
  - That will change shortly after the 2008 elections, regardless of the party in office
  - How the rules are written is crucial to $$
  - Regional efforts developing momentum for national standard
  - Current pricing CCX (US) $2.25 ton, EUX €23.10

When a developer looks, what do they look for?

- Wood Supply
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- Energy Costs
- Permitting Speed

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