Wood Energy Summit
17 February 2010

MICHIGAN STATE UNIVERSITY EXTENSION
“The best way to predict the future is to invent it”

-Alan Kay
Michigan uses the equivalent of 3.1 quadrillion BTUs of energy. 87% comes from FFs.

3 solutions . . .

- use less energy
- use fewer FFs
- use more wood
  (and other renewables)
Michigan Energy Sources

How It’s Used

- Oil
- Nat. Gas
- Coal
- Nuclear

- Transportation
- Residential
- Industry
- Comm.
How Does Woody Biomass Fit Into This Picture?

Reduce Fossil Fuel Use

Vigorous Forests Draw More Carbon

Help Rural Economies

Use Local Resources

Keep More Money Local

It’s What We Have!!
Biomass < 3% of State Total
How to Get the Energy?

The biochemical process:
Hydrolyze & ferment $\rightarrow$ Fuels & chemicals

The thermo chemical process:
Pyrolize & reform $\rightarrow$ Fuels & chemicals

Burn wood more efficiently:
CHP & District Heating Systems
Renewable Energy Wedges Combine To Reduce Non-renewable Energy Use

Energy Use

Yesterday  Today  Tomorrow

Agriculture
Municipal Residues
Mill Residues
Forest Residues
Energy Plantations
Forests

Concept borrowed from Robert Socolow

Conservation
Sources of new lignocellulose

Possibly 40 million dry tons annually
What Biomass Pools Does Michigan Have?

A MILLION CUBIC METERS OF WOOD
(~440,000 cords, ~500,000 dry tons)

Michigan grows ~26 times this much wood each year

~50 million gallons ethanol

Electricity for ~half million homes

1/2 wood supply for Mascoma

80% of Weyerhaeuser mill

2 Grayling power plants
Some Challenges with Wood

- High transportation costs
- Competition with traditional industry
- Habitat impacts (+ & -)
- Nutrient limitations on some soils
- Harvest technology
- Supply chains poorly understood
- Inconsistent logging infrastructure
- Public attitude about harvesting
- Perception of smoke, truck traffic
- Liquid fuel conversion technology
Partial List of Current Projects

Pulp & paper mills
Major sawmills & board mills
Mascoma-Frontier Renew. Res.
Renewafuel-Cliffs Res.
~6 Pellet Manufacturers
7-8 Wood Using Utilities
Fuels for Schools & BURN-UP
Paradise Briquettes
Project in Gaylord?
LaFarge Cement?
White Pine Power?
NMU co-gen boiler?
Escanaba power plant?
In the United States we ask:

**How can I buy the biggest, shiniest, cheapest thing?** (kilowatt, TV, gasoline, T-shirt)

The result:

We shop at Wal-Mart for goods made in China, and close our factories.
The question might be: How can **WE** get the most out of what we have?

The result: Adding value to local resources and pay attention to consequences.
IRRESPONSIBILITY

No single raindrop believes it is to blame for the flood.