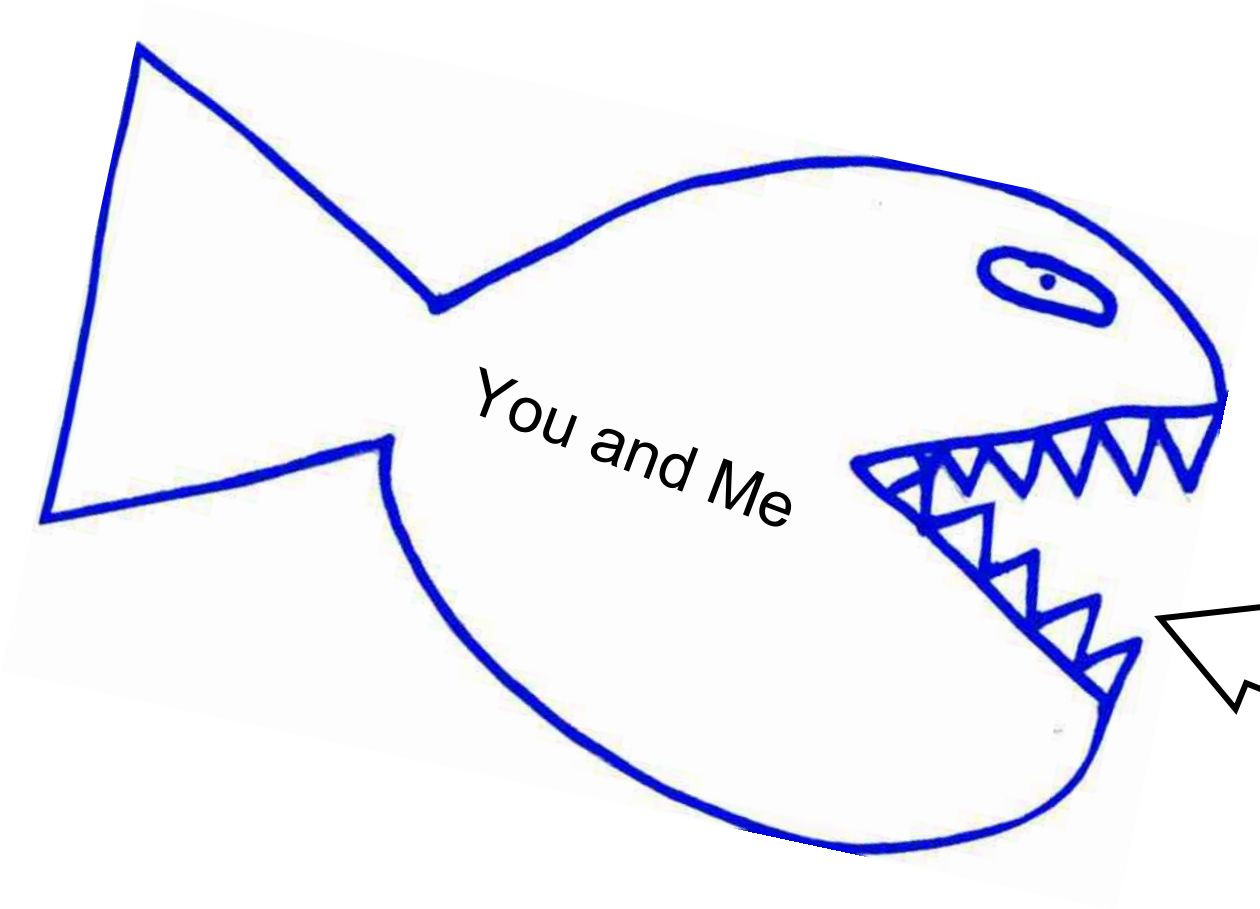
Biofuels: Why All the Hype?



140,415,500,000
gallons gasoline

39,000,000,000
gallons diesel

Ethanol

Biodiesel

Electricity

Jason Fischbach
UWEX Agriculture Agent
Ashland and Bayfield County

Fossil Fuels Are Increasingly Source and Sink Limited

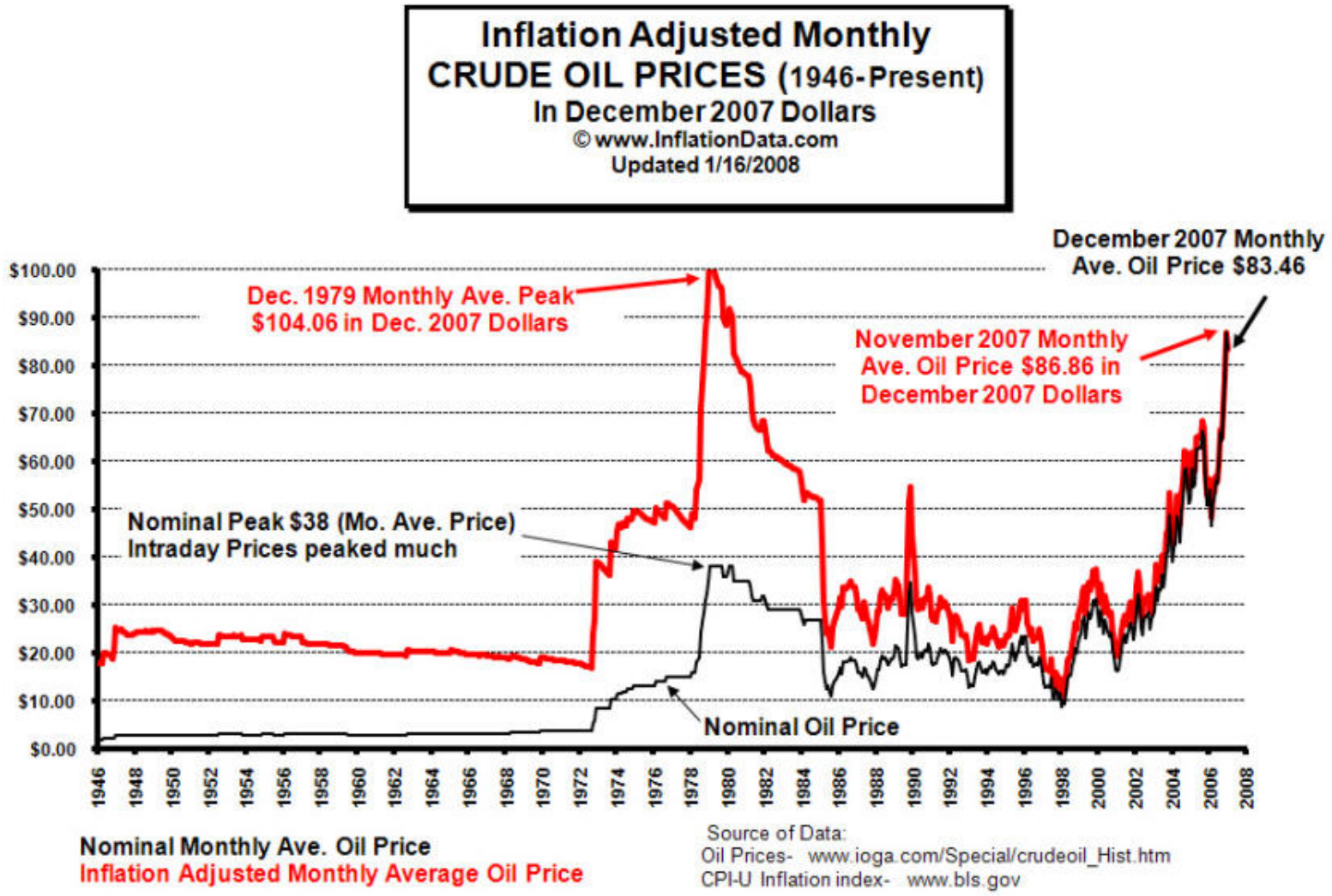
Diminishing Supplies of Fossil Fuels:

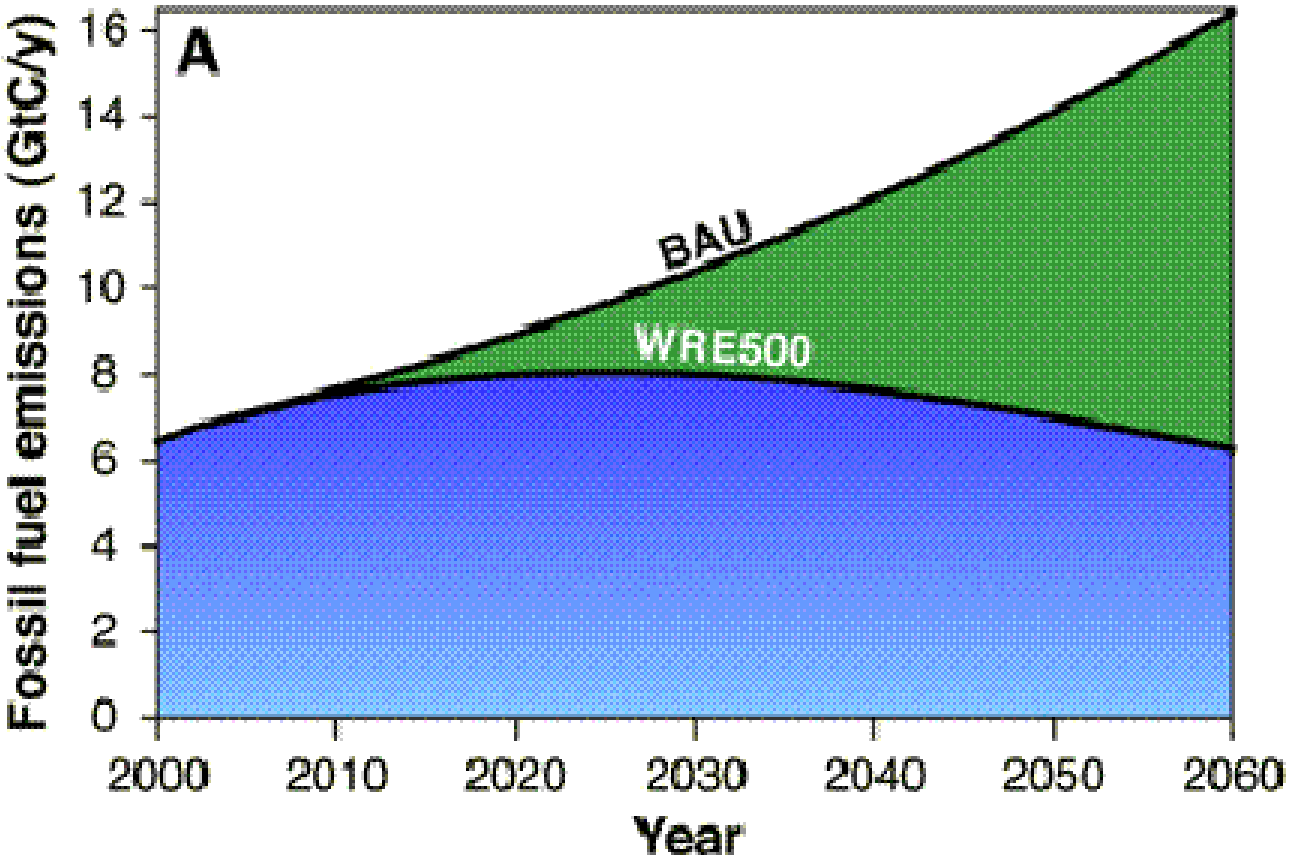
Petroleum, Natural Gas, Coal

Increasing Problems of Fossil Fuel Use:

Smog, Mercury, Atmospheric CO2

We are looking for alternative fuel sources….again….but this time it's for real





Accelerating CO2 emissions and associated global warming are driving carbon neutral or carbon negative energy sources

Socolow, 2004

The Potential of Biodiesel

Canola as a feedstock:

- 43% oil
- 1800 pounds per acre
- 100 gallons biodiesel per acre

2005 US Soybean Acreage: 72,032,000 acres

72,032,000 acres x 100 gallons/acre = 7,203,200,000 gallons

7,203,200,000 / 39,000,000,000 = 18%

Realistic Use: 25% of soybean acreage, 44 bushels/acre, 50% oil

1,944,864,000 / 39,000,000,000 = 5%

The Potential of Ethanol

Corn grain as a feedstock:

- 2.7 gallons per bushel
- 150 bushels per acre
- 405 gallons ethanol per acre
- 303 gallons G.E. per acre

2005 US Corn Acreage: 81,759,000 acres

81,759,000 acres x 303 gallons/acre = 24,854,736,000 gallons

24,854,736,000 / 140,415,500,000 = 18%

Realistic Use: 20% of production, 170 bushels/acre, 3.0 gal/bu

6,254,563,500 / 140,415,500,000 = 4%

The Potential of Wood

US Energy Consumption in 2000:
100 Quads (1 quad = 1 quadrillion BTUs)

5.8 billion cords of aspen has 100 Quads

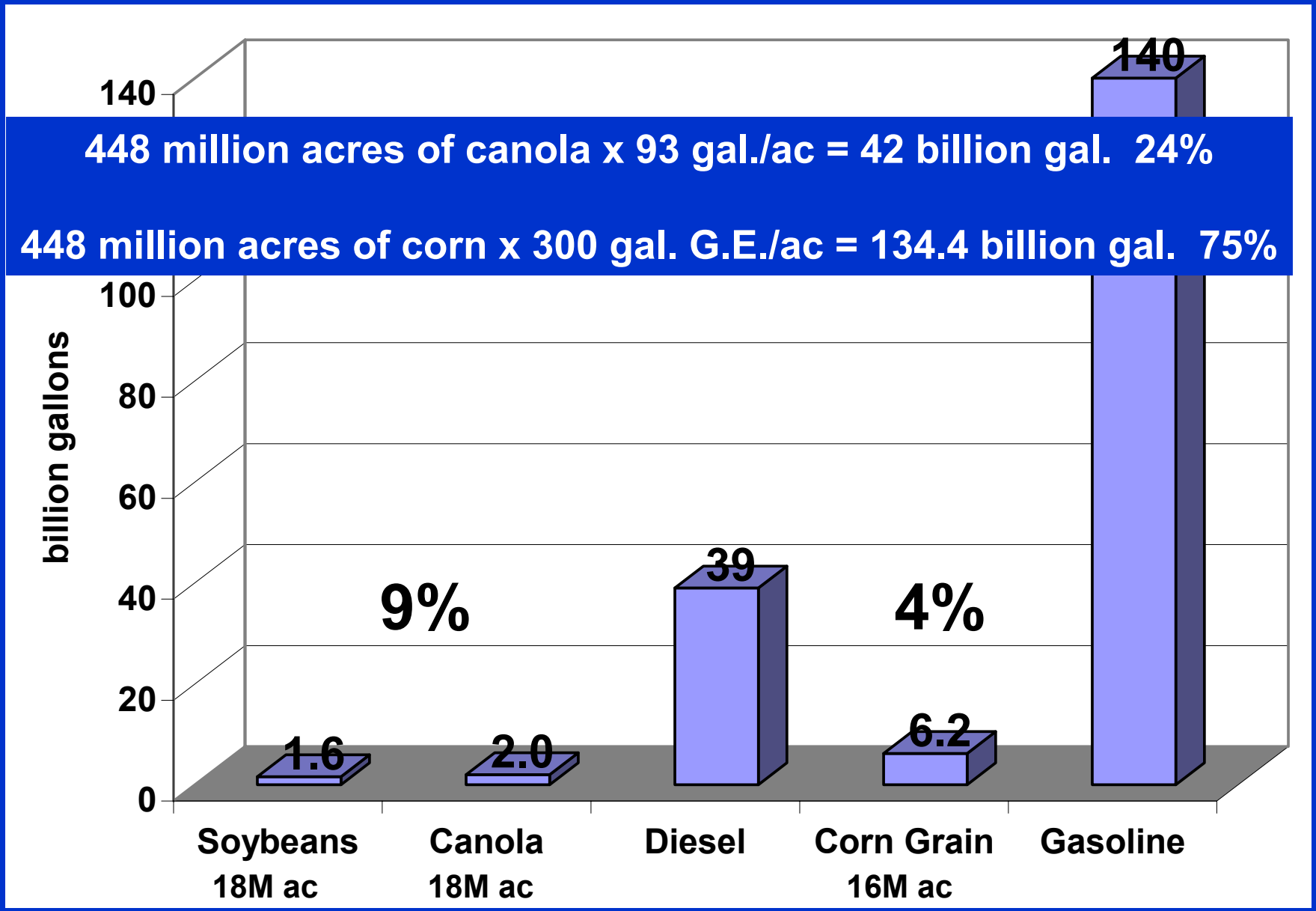
Average aspen stand yields 20 cords/acre

290,000,000 acres of aspen clearcut each year

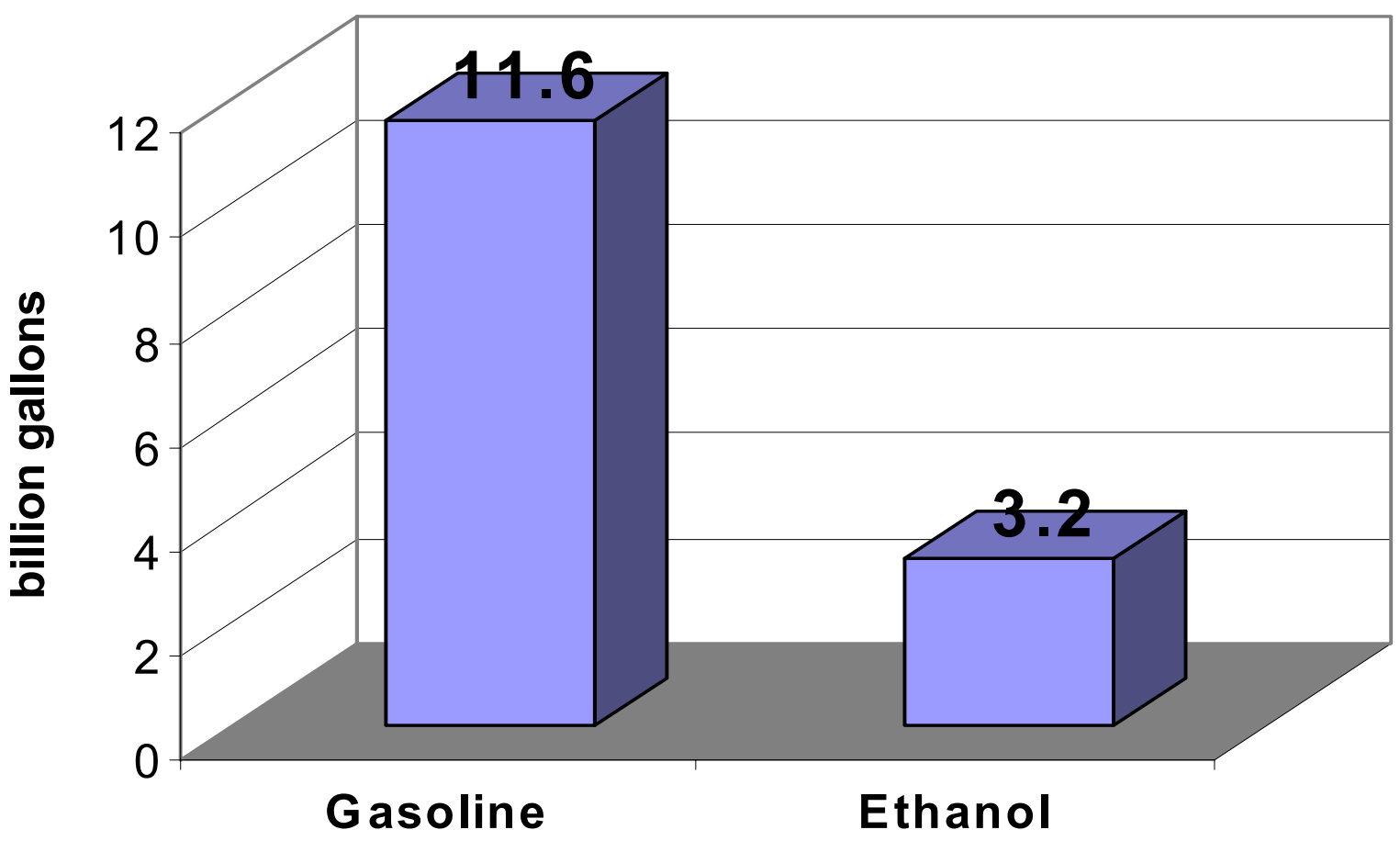
Minnesota cut 3 million cords = 1%

Source: Mike Demchick

The Insatiable Demand for Energy

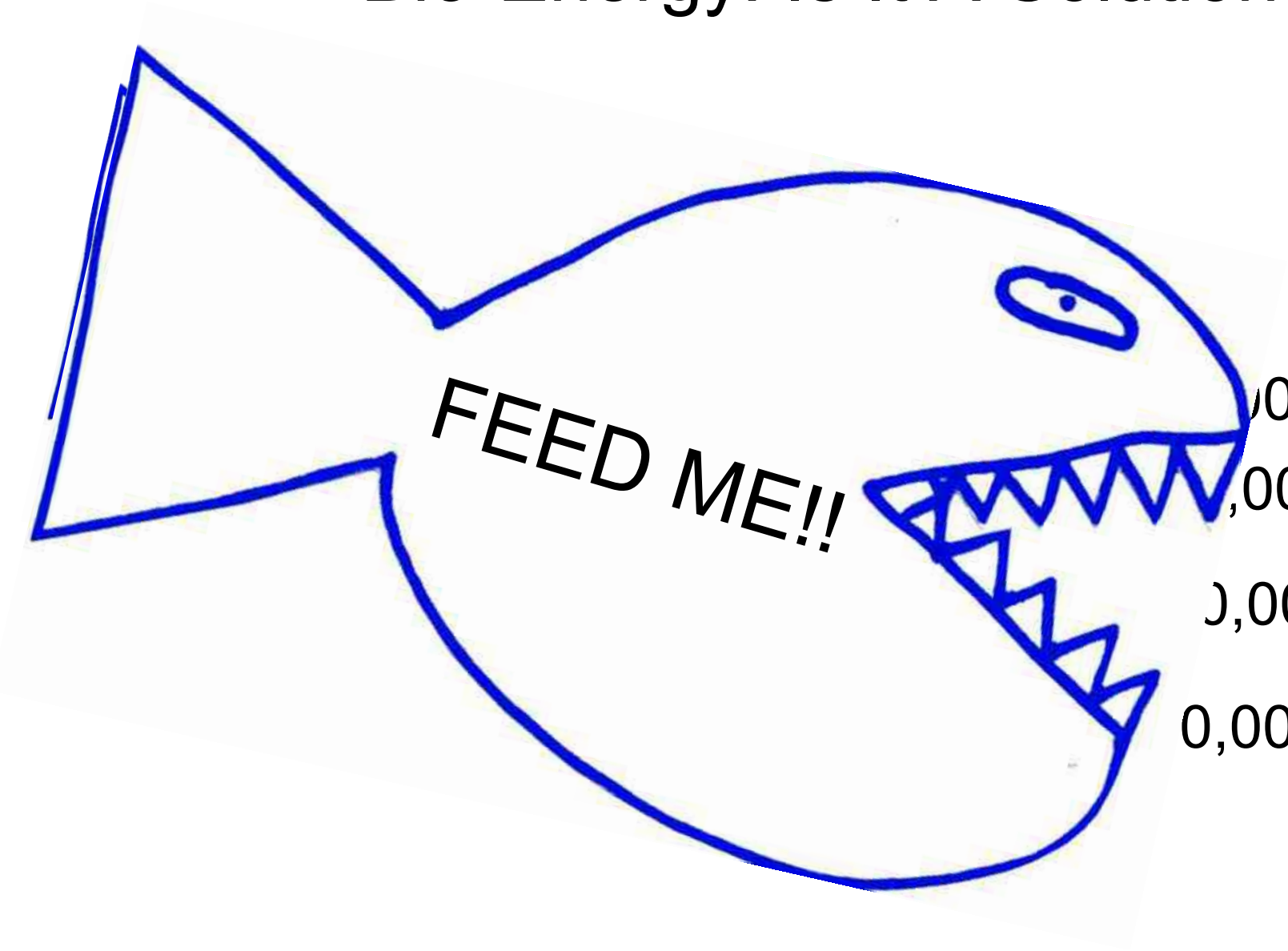


Biofuels are supposed to reduce our reliance on petroleum….. but they haven't.



Source: EIA and Renewable Fuels Assocation

Bio-Energy: Is It A Solution?



Biofuels…Why all the hype?

It is energetically impossible to replace 100% of fossil fuel energy with biofuels.

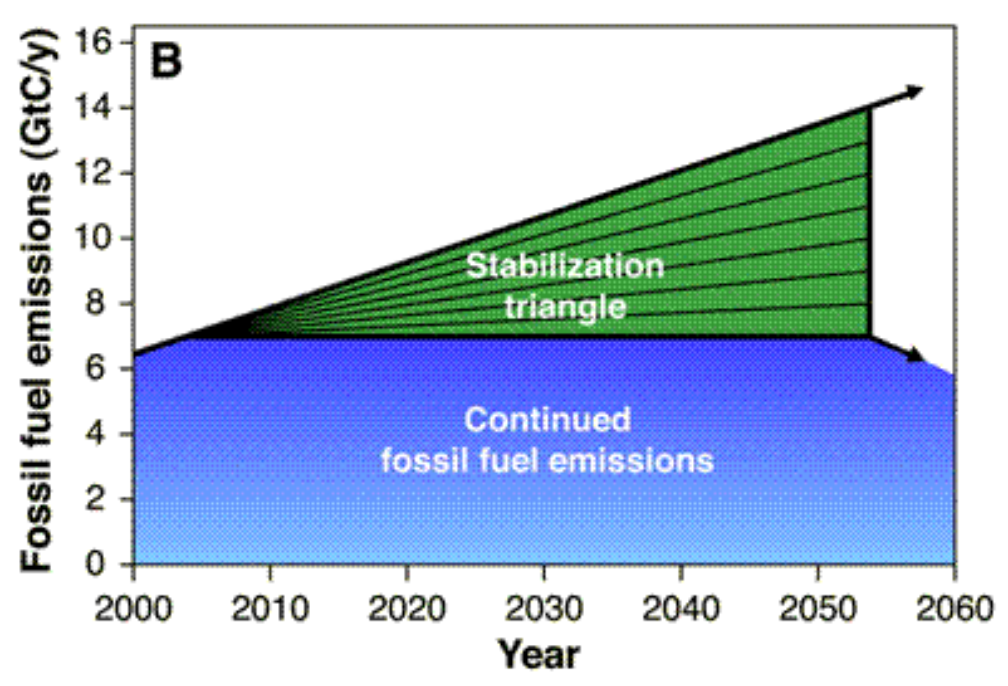
USDA and Department of Energy 2005 Billion-Ton Biomass Study

By 2050, the US could produce 1.3 billion tons of biomass to supply…….

30% of our transportation fuels.

Biofuels Are Only Part of The Answer (The 14 Wedges)

- Residential Energy Efficiency
- Transportation Efficiency
- Heating Efficiency
- Fuel Switching for Electricity
- Fuel Switching for Heat Production
- Carbon Capture and Storage
- CCS for Hydrogen Production
- Nuclear for Electricity
- Nuclear for Hydrogen
- Wind for Electricity
- Wood for Hydrogen
- Solar Electricity
- Biofuels
- Natural Carbon Sinks



Socolow, 2004

Biofuels…Why all the hype?

It is energetically impossible to replace 100% of fossil fuel energy with biofuels.

Therefore, there is unlimited demand for bioenergy and huge market opportunities

Hence, all the hype.

The Biofuel Boom

- 25 by 25
- Office of Energy Independence
- Tax incentives, blenders credit, commodity subsidies
- Rhetoric

Are We Headed For A Bust?

- Beaver
- Gold
- Timber
- Iron Ore
- Dot coms
- Bioenergy?