

# **2008 Legislative Ag Chair Summit**

## **Energizing Rural America**

John Sheehan, Live Fuels, Inc.

Gina Bowman, Coffeyville Resources

Tony Ahern, Buckeye Power

David Dunn, Cow Power, Central Vermont Power

Bill Schafer, Range Fuels

Jim Sims, Western Business Roundtable

# Algae—an “end-run” around the food-vs-fuel debate?

John Sheehan  
Vice President  
Strategy and Sustainable Development

LiveFuels™

# Food versus fuel

- “Thousands in Mexico City Protest Rising Food Prices”
  - New York Times, January 2007



“The tortilla effect”

# Food versus fuel

- “Biofuel brews up higher German beer prices”
  - Associated Press, May 2007



The brewery effect?

- Brewer Michael Riesch sits at the monitors controlling the brewing devices in front of a historic photograph from the brewery's foundation years at the Ayinger brewery in Aying, southern Germany. The German government's subsidies to plant crops for sale as environmentally friendly biofuels are driving up the price of barley for Germany's brewers.

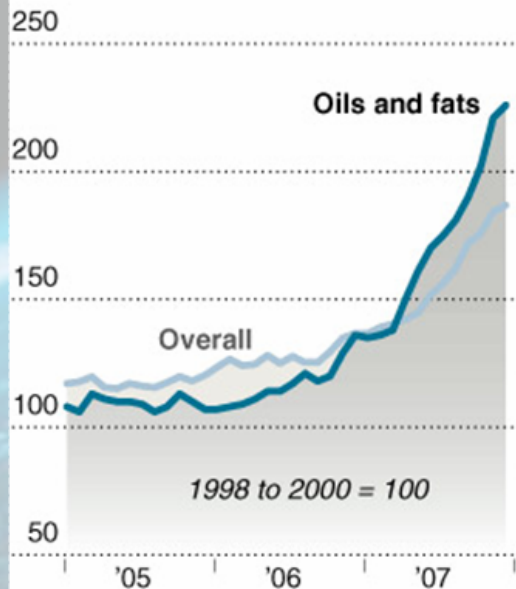
# Food versus fuel

## Rising Costs Felt at the World's Dinner Tables

### FOOD PRICES

Export prices for 60 internationally traded food commodities have soared. No category has risen faster than oils and fats.

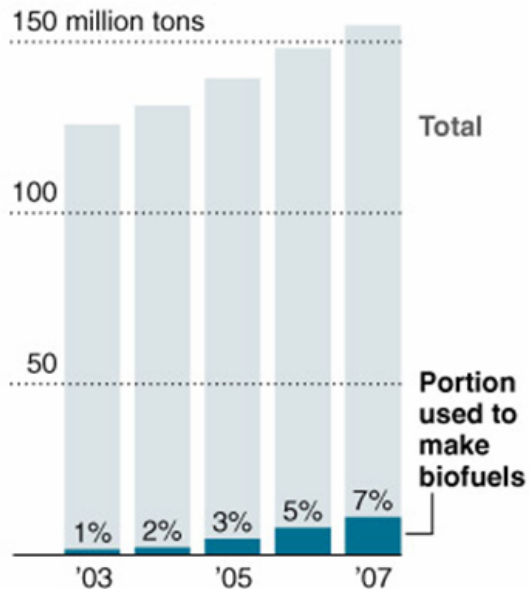
*United Nations Food and Agriculture Organization food price index*



### OIL CONSUMPTION

Most vegetable oil is used for food purposes. But turning it into biofuels represents the fastest-growing demand for oils.

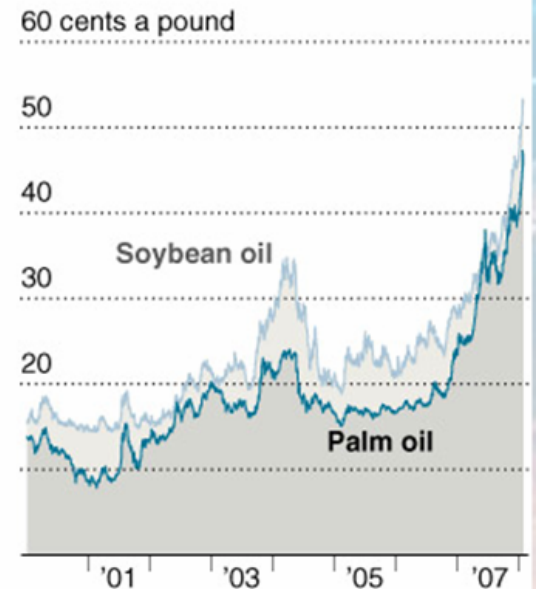
*World consumption of oils and fats*



### OIL PRICES

Farmers in the United States and China have been planting less soy, causing a shortage that has helped raise prices for palm oil, the main alternative to soybean oil.

*Near-month futures contracts*



Sources: Bursa Malaysia, Chicago Board of Trade, via CEIC Data; United Nations Food and Agriculture Organization; Oil World

# Food & land versus fuel

- “EU did not foresee the problems raised by its policy to get 10% of Europe's road fuels from plants.”

–BBC News January 2008



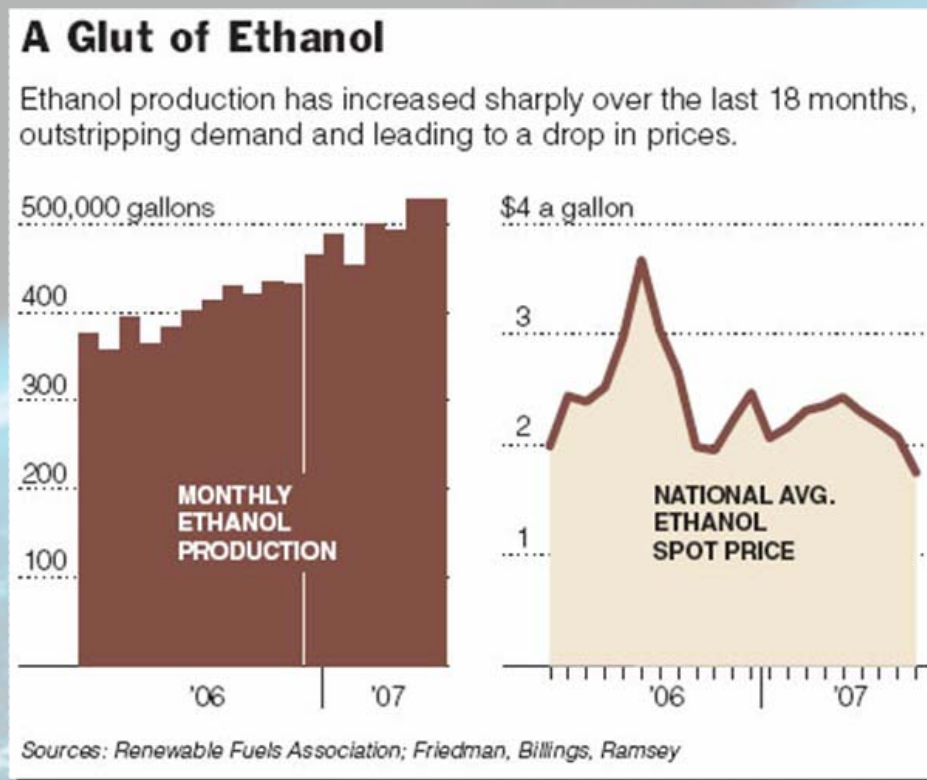
Palm plantations are replacing the original forest in some areas  
BBC News

“We have seen that the environmental problems caused by biofuels and also the social problems are bigger than we thought they were. So we have to move very carefully”

—EU Environment Commissioner

# Food versus fuel

- “Ethanol’s Boom Stalling as Glut Depresses Price”  
– New York Times, September 2007



While generous government support is expected to keep the output of ethanol fuel growing, the poorly planned overexpansion of the industry raises questions about its ability to fulfill the hopes of President Bush and other policy makers to serve as a serious antidote to the nation’s heavy reliance on foreign oil.

# Water—the 800-lb gorilla



Biofuels production can use on the order of 5 to 7 gallons of water for each gallon of fuel produced—and that doesn't count water for irrigation

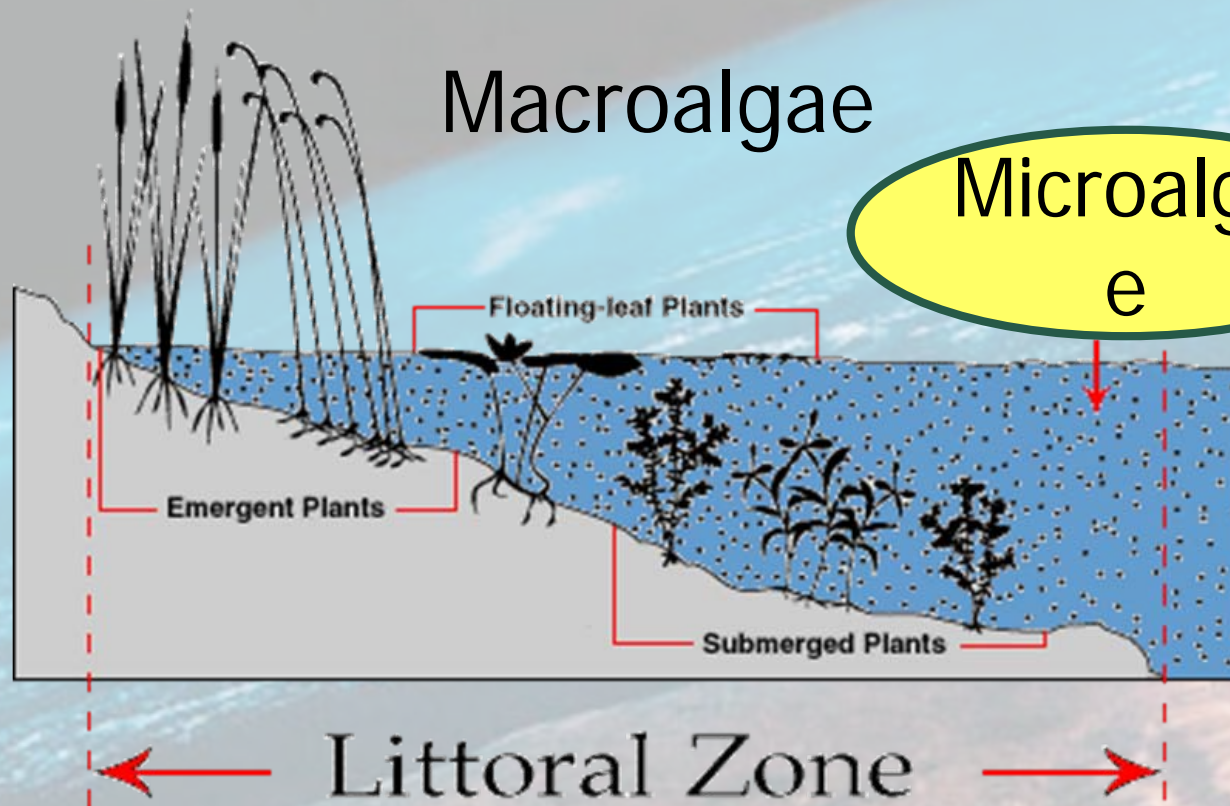


# Enter algae

Emergents

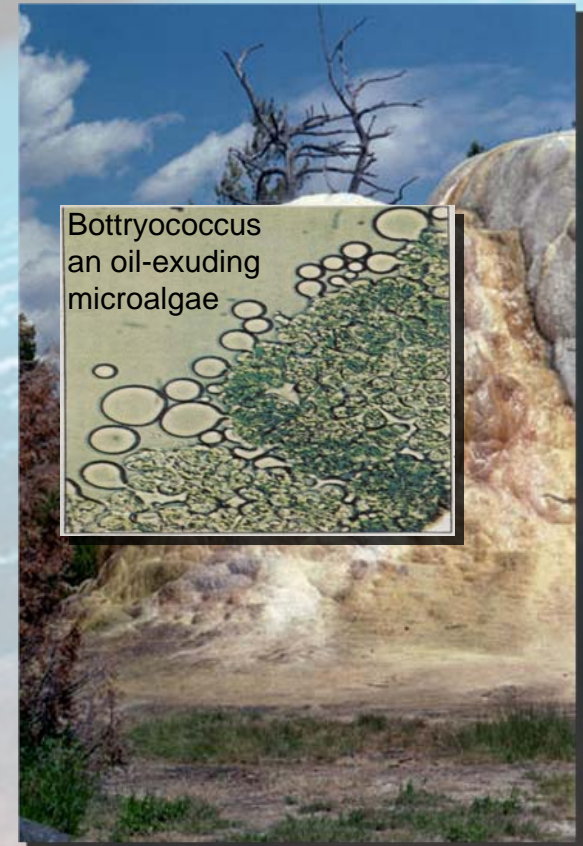
Macroalgae

Microalgae

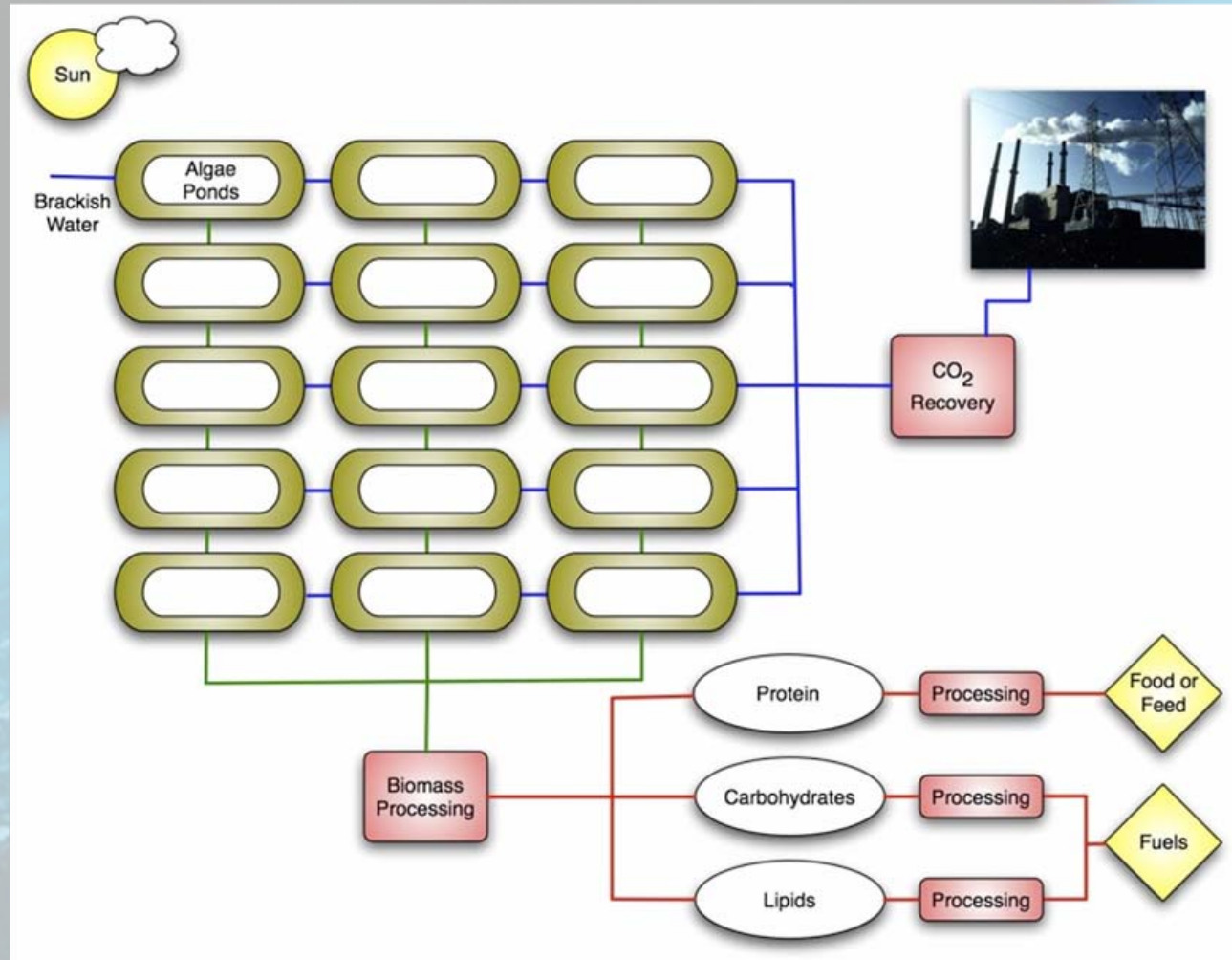


# Prehistoric plants

- A High-Risk, High-Benefit Opportunity
  - Grow where few other plants could survive
  - Hot climates
  - Salt water
  - The source of much of today's oil reserve?

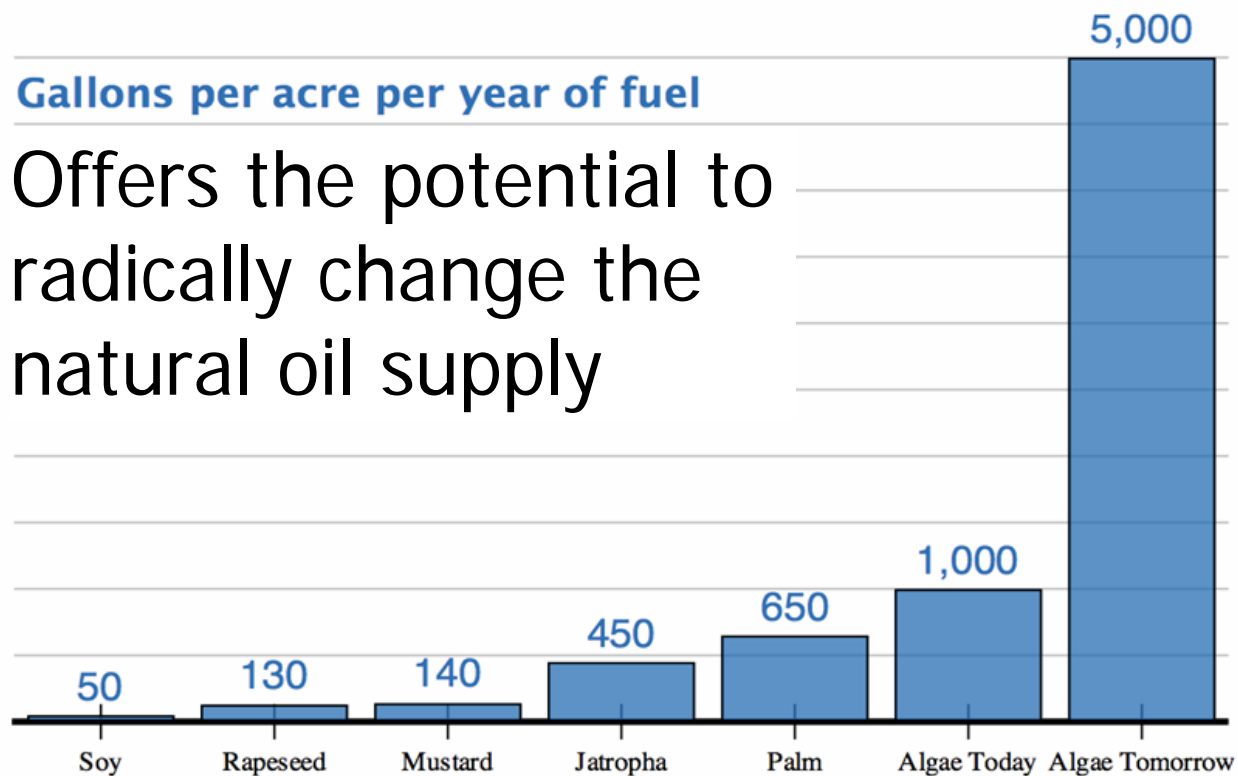


# A new kind of farm



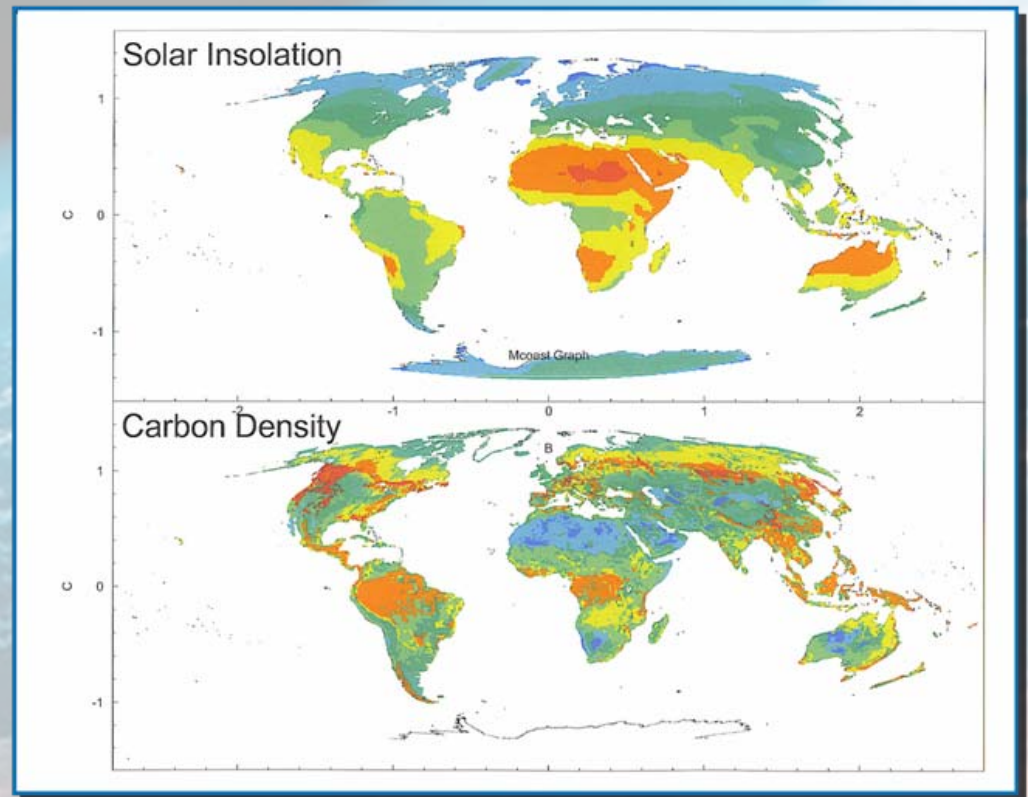
# Changing the equation

- More efficient use of land



# Changing the equation

- Grows wherever you won't find conventional agriculture
- Where land is suited for food production, that is its best use



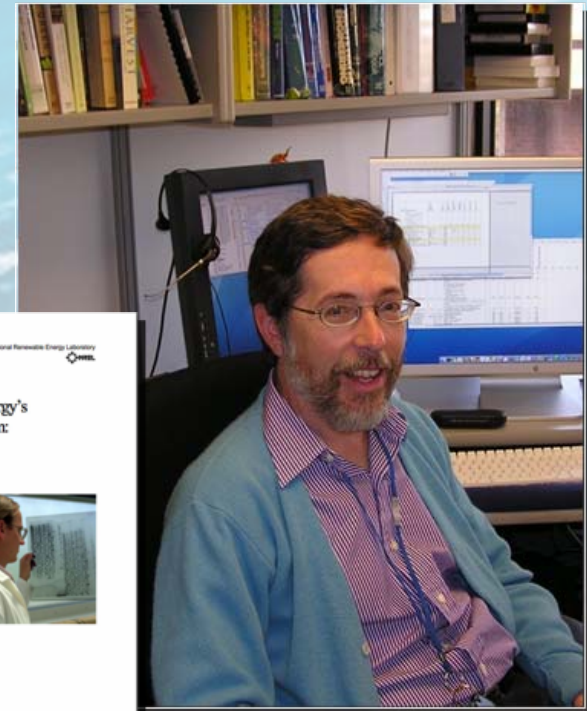
# LiveFuels™, Inc.

- Founded in 2006
- “Mini-Manhattan Project” to make fuel from algae
- \$10 million in funds
- Lissa Morgenthaler-Jones, CEO
- Dave Jones, COO



# LiveFuels™, Inc.

- John Sheehan
- The last program manager of DOE's "Aquatic Species Program"
- 16-years at NREL
- Joined LiveFuels™ in July 2007



# LiveFuels™, Inc.

- Getting to first base...
  - 300+ acre site in southern California
  - 150 acres of ponds
  - Algae as a byproduct of an existing commercial farm





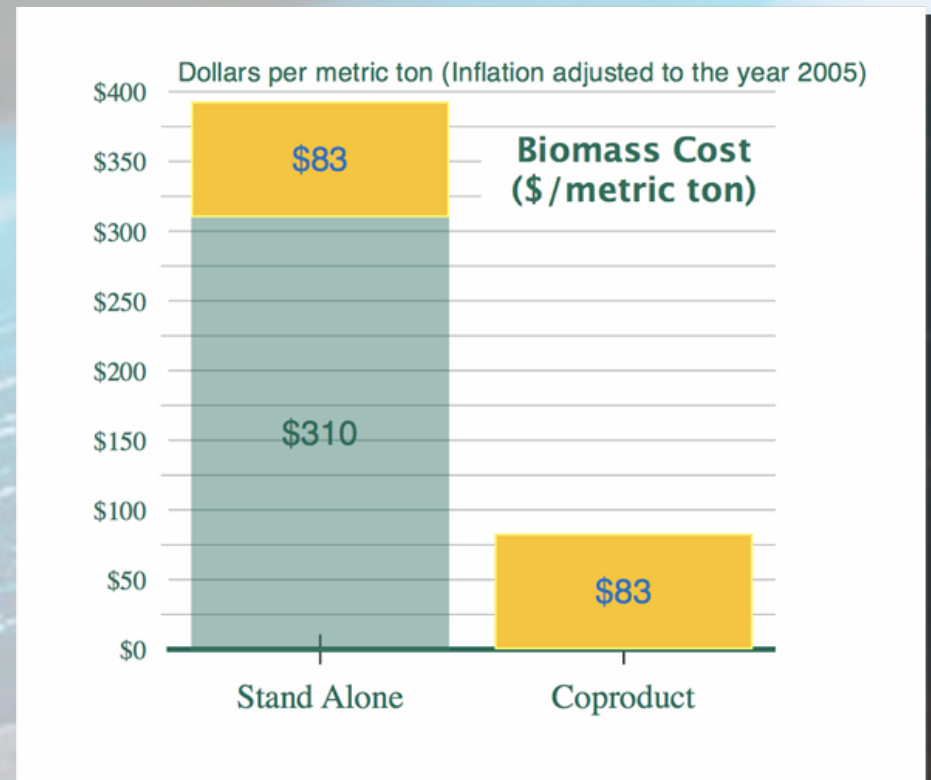
# LiveFuels™, Inc.

- Getting to first base...
  - a natural ecosystem where algae come along for the ride



# LiveFuels™, Inc.

- Getting to first base...
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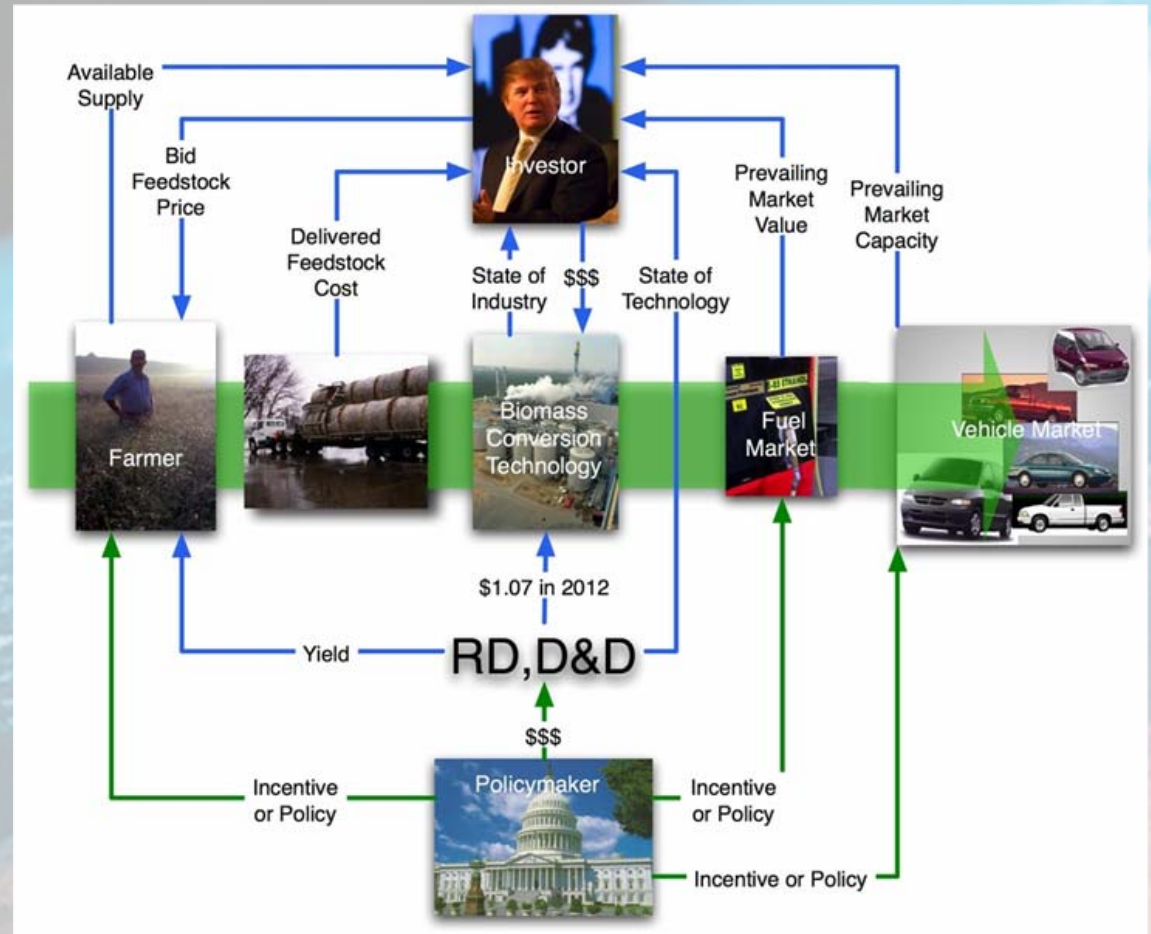
- The algae in-hand today will not look like the algae in a large scale industry




New organisms  
New “bioreactors”

# Thoughts for legislators

- As my discussion on “food versus fuel” suggests, many of the past and present policies have failed



An aerial photograph showing a coastline. The top half of the image is dominated by a deep blue ocean with white-capped waves breaking against a dark, rocky shore. Below the water, the land is a mix of brown and tan, suggesting a dry or semi-arid environment. The text is overlaid on the upper left portion of the image.

Generous, industry  
specific subsidies, credits  
and mandates  
DON'T WORK

# Investment bubbles

- Investment in the “easy” technologies like corn ethanol and biodiesel
- Both ethanol and biodiesel are now facing
  - Exorbitant feedstock prices
  - Market gluts

# Special interest politics

- The case of biodiesel's generous subsidy
  - Ridiculous special interest fight over who gets to be called "biodiesel"
  - (a.k.a. who gets to luxuriate in this windfall)
- The case of renewable diesel
  - "Big Oil" as a victim?



# Policy perversions

- Splash and Dash





# Policy perversions

- FFVs and CAFE



# Unintended consequences

- Higher food prices
- Unsustainable agricultural practices
- Market chaos
- Encroachment on vital natural habitats
- Minimal benefits viz a viz our real energy problem



So what should you do?

# Focus on the public good

- Energy security?
- Climate change?
- Economic well-being?
- Public health?

# Think holistically

"The common aim must be to **expand resources** and improve **quality of life** for as many people as heedless population growth forces upon **Earth**, and do it with **minimal prosthetic dependence**. That, in essence is **the ethic of sustainable development**." E.O. Wilson Consilience (1998)



# Use life cycle assessment

**“We need an LCA process that addresses all sustainability issues and is accepted worldwide”**

Paraphrased from talk by Dean Simeroth, CARB, commenting on hurdles facing implementation of a low carbon fuel standard in California



# In closing

- Think holistically
- Focus on societal needs, not technology-specific solutions, and not special interest needs
- Manage risk
- Don't repeat our past mistakes
- Aim for transparency in the process
- Be patient—don't buy into quick-fix solutions. Creating a new sustainable fuel supply will take time