



US Biodiesel Industry Present and Future

Joe Jobe, CEO

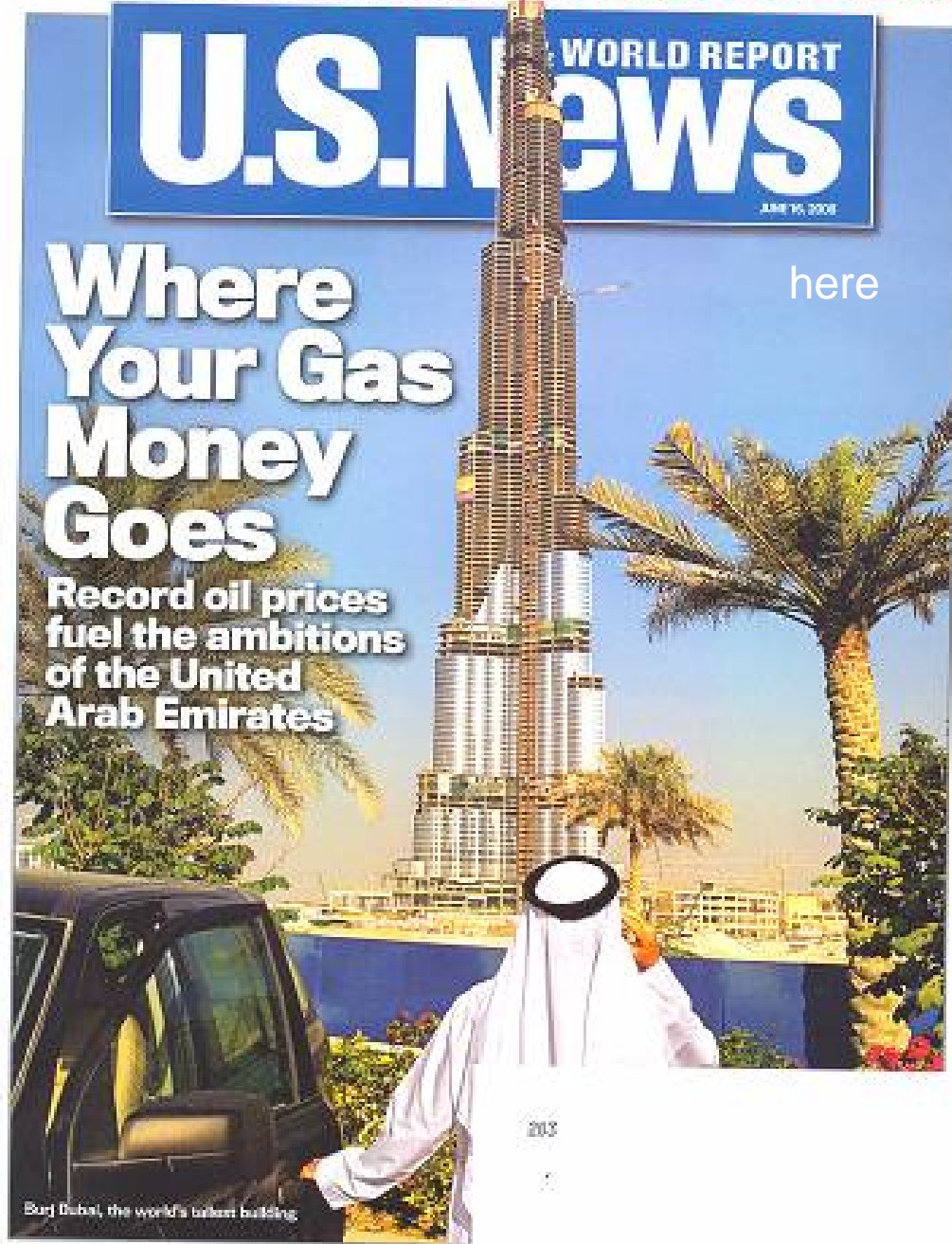
National Biodiesel Board

Kansas City, Missouri

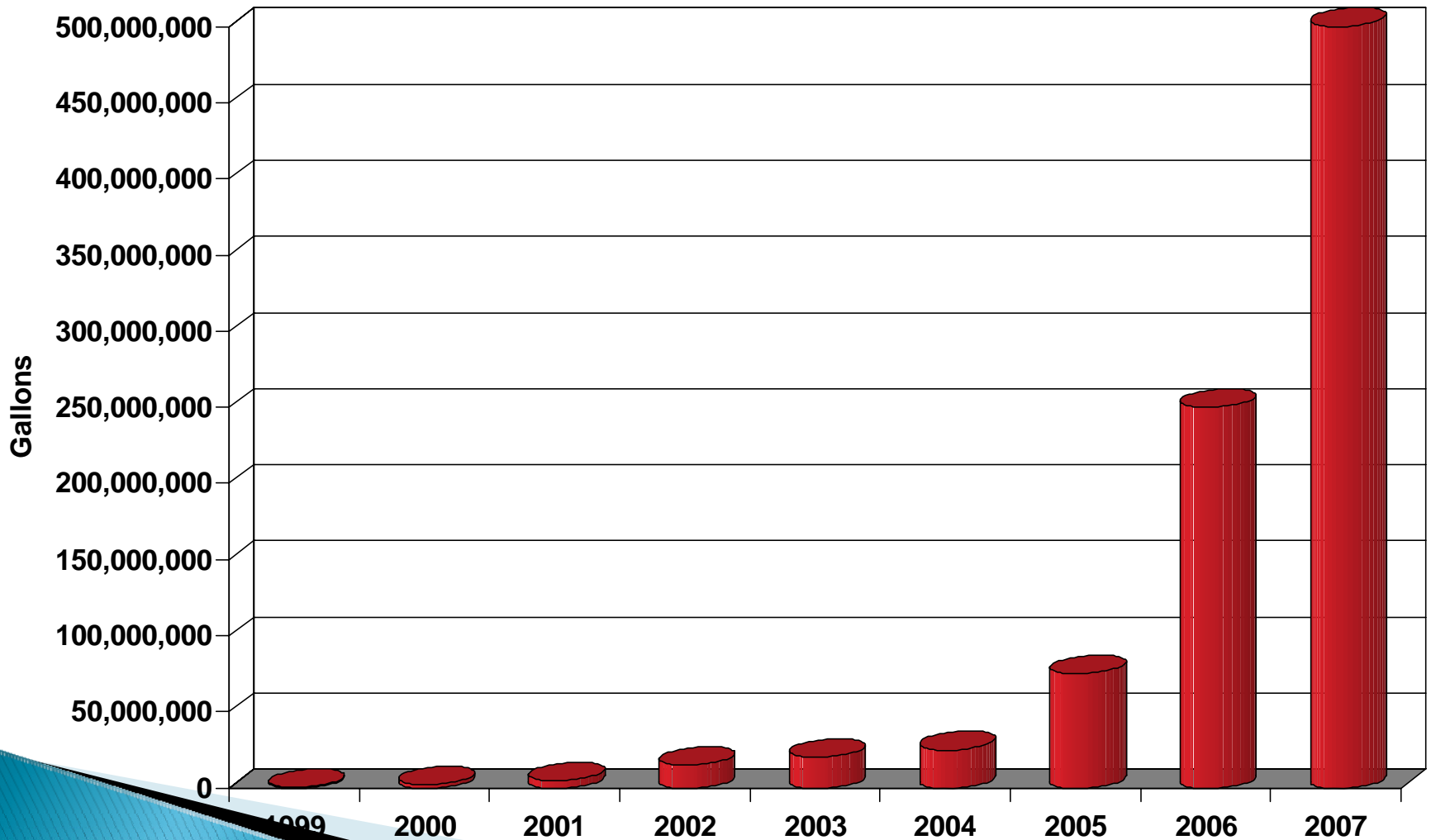
September 9, 2008

Obama's Next Challenge • The Benefits of Stress

“We’re producing 3 million barrels a day at \$120 a barrel. You do the math.”
Hussain al-Nowais, a prominent UAE businessman.

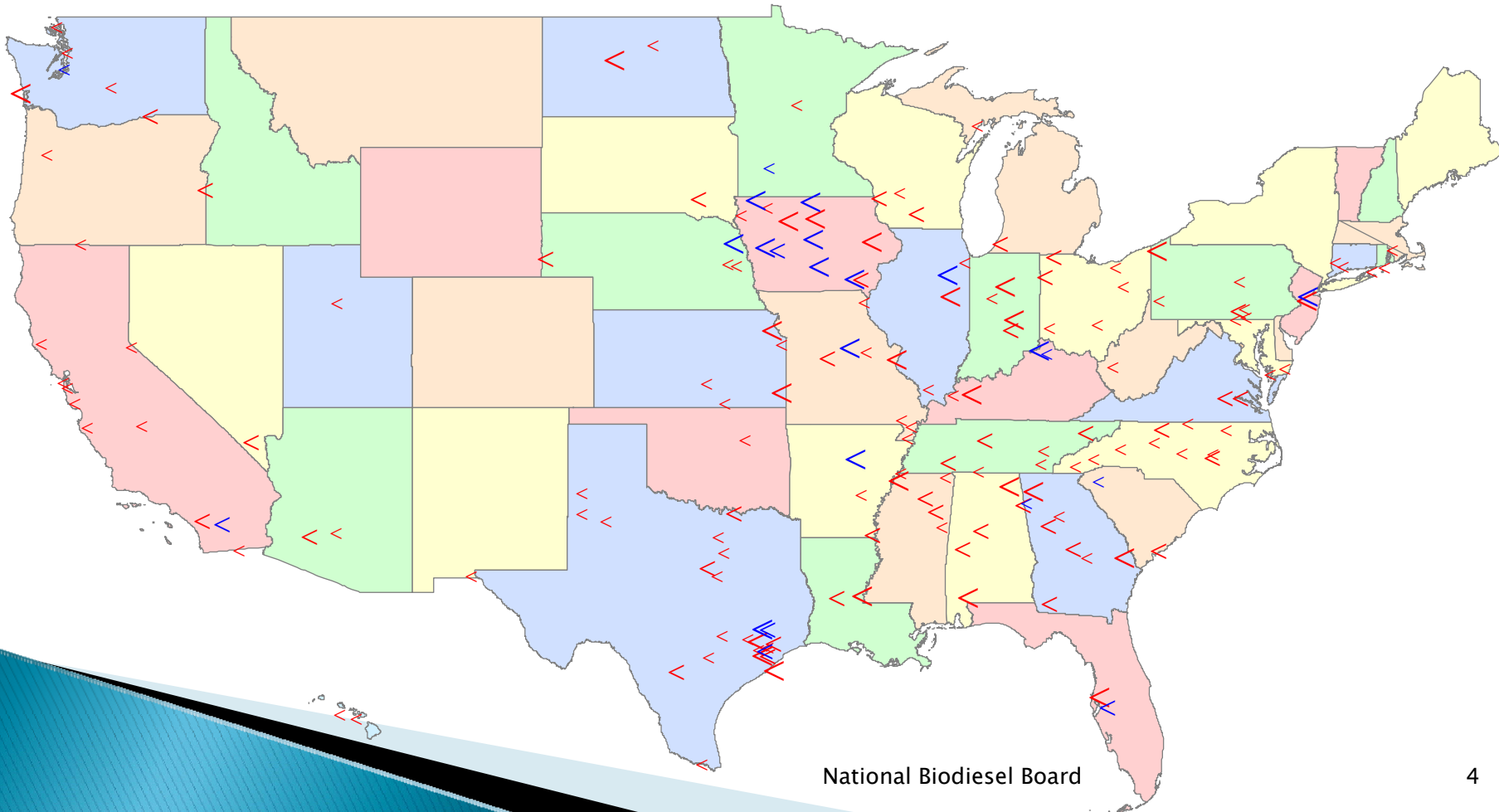


US Biodiesel Production

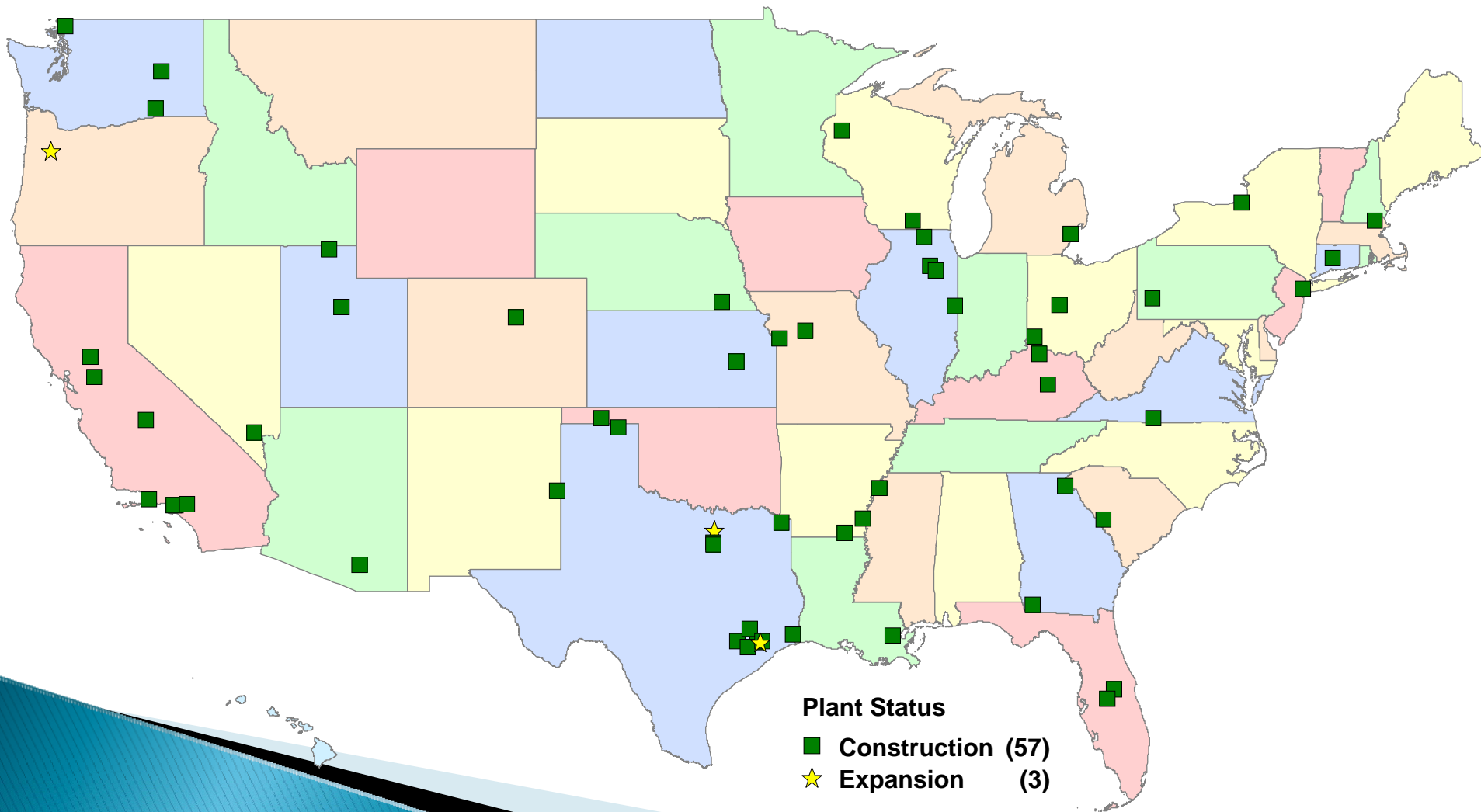


U.S. Biodiesel Industry Today

- Actual 2007 production of 500 mgy
- Estimated 2008 production of 600 mgy
- 171 plants in 40 states.



Biodiesel Plants Under Construction & Expansion (1/25/08)



US industry goal: 5 x 15

- ▶ 5% on-road displacement by 2015 \approx 1.85bgg (met in various blend levels)
- ▶ 5% \approx amt of US diesel refined from Iraqi crude
- ▶ 5% \approx $\frac{1}{4}$ of diesel equivalent refined from Persian Gulf Crude.
- ▶ 5% \approx a volume relevant to greenhouse gas reduction, energy security, and feedstock supply
 - Finding realistic replacements are especially important for heavy duty. Many future options will be effective in reducing gasoline in light duty.

What are the benefits of Biodiesel

- ✓ Energy Security – US spending well over \$1B per day on foreign oil.
 - ✓ Exploding trade deficit with largest transfer of wealth in human history to nations hostile to America.
 - ✓ Biodiesel adds to fuel supply, refinery capacity, green jobs
- ✓ Environment – biodiesel < viturally all regulated emissions
 - ✓ PM and NOx past drivers for diesel. Now HC, air toxics, renewability, and carbon... all things biodiesel addresses better than any current commercially available fuel.
- ✓ Climate Change – biodiesel reduces lifecycle CO2 by 78%
- ✓ Sustainability – highest energy balance of any fuel 3.5: 1
- ✓ Performance – better on lubricity, cetane, oxygen, and sulfur; worse on stability, cold flow; same on horsepower, torque, fuel efficiency.

Quality is Job 1, 2, ...3

Three “E’s” of Fuel Quality

1. Enforcement of Standards
 - Vigorous enforcement by government
 - NCWM, State W&M, IRS, EPA, others
2. Education and Outreach
 - Education of Petro industry & regulatory authorities
3. Encouragement
 - BQ-9000



NREL Fuel Survey

90% of total biodiesel volume in spec

- Small companies still high percent out of spec but doesn't represent much volume



BQ-9000 program virtually all in spec

- Only one sample was out of spec for water, which was most likely sample contamination

Spec enforcement and BQ-9000 are WORKING!!!

Renewable Fuels Standard

<u>Year</u>	<u>Volume in billions of gallons</u>	<u>Conventional Biofuels</u> (may include all fuels)	<u>Advanced Biofuels</u>	<u>Cellulosic Biofuels</u>	<u>Biomass-Based Diesel</u>	<u>Undifferentiated Advanced Biofuels</u> (All fuels except conventional)
2006	4.000	4.000				
2007	4.700	4.700				
2008	9.000	9.000				
2009	11.100	10.500	0.600		0.500	0.100
2010	12.950	12.000	0.950	0.100	0.650	0.200
2011	13.950	12.600	1.350	0.250	0.800	0.300
2012	15.200	13.200	2.000	0.500	1.000	0.500
2013	16.550	13.800	2.750	1.000	≥1.000*	0.750
2014	18.150	14.400	3.750	1.750	≥1.000*	1.000
2015	20.500	15.000	5.500	3.000	≥1.000*	1.500
2016	22.250	15.000	7.250	4.250	≥1.000*	2.000
2017	24.000	15.000	9.000	5.500	≥1.000*	2.500
2018	26.000	15.000	11.000	7.000	≥1.000*	3.000
2019	28.000	15.000	13.000	8.500	≥1.000*	3.500
2020	30.000	15.000	15.000	10.500	≥1.000*	3.500
2021	33.000	15.000	18.000	13.500	≥1.000*	3.500
2022	36.000	15.000	21.000	16.000	≥1.000*	4.000

* Administrator determines minimum use allocation for out years

An Industry Under Attack

Food Vs. Fuel Campaign





Joe Klein: How
Al Gore Could Save
The Democrats



Hillary Clinton
On Why She
Won't Quit



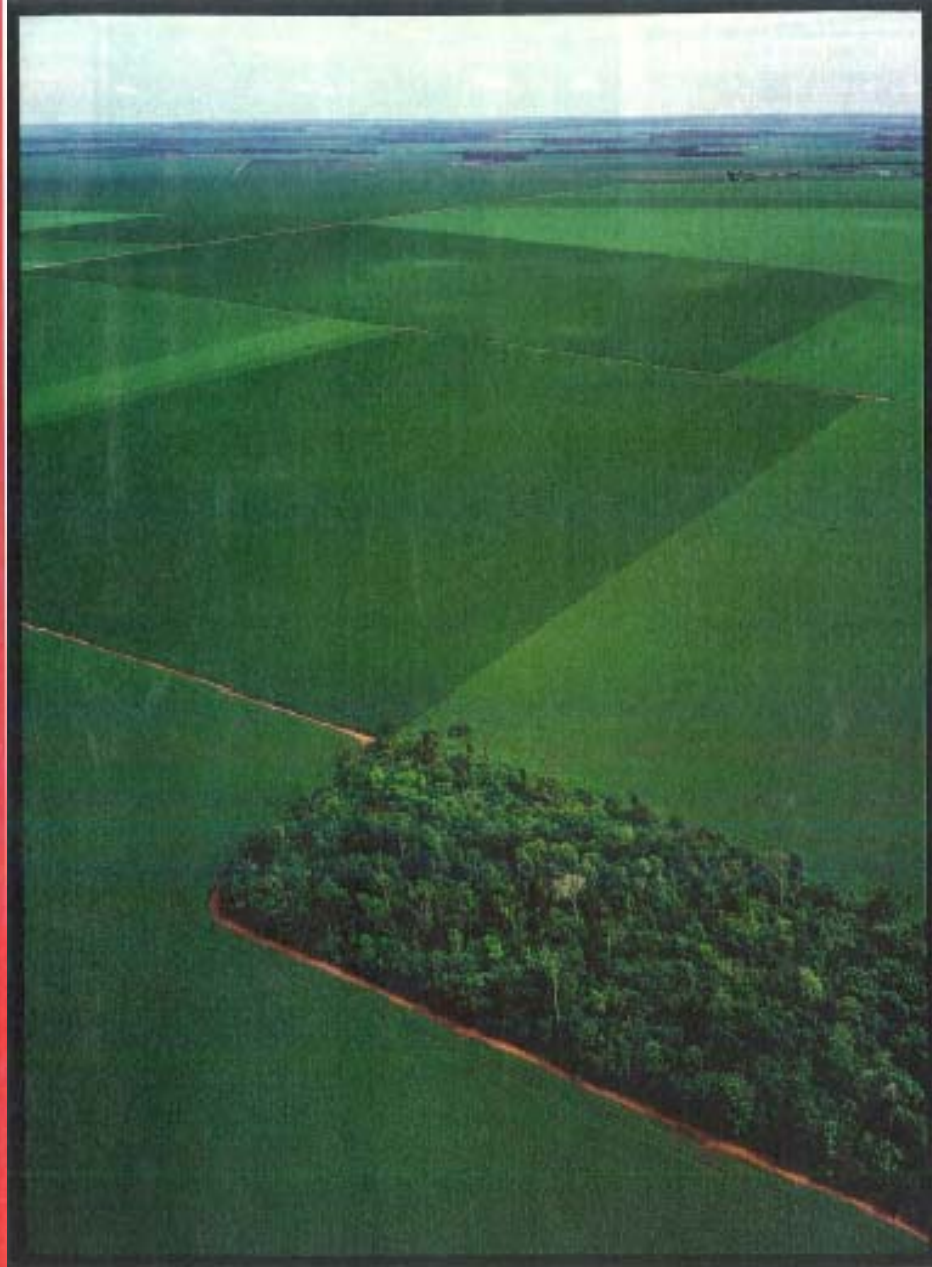
R.E.M.
Rises from
The Dead

TIME

The Clean Energy Myth

BY MICHAEL GRUNWALD

Politicians and Big Business are pushing biofuels like corn-based ethanol as alternatives to oil. All they're really doing is driving up food prices and making global warming worse—and you're paying for it



Deforested A tiny slice of preserved transitional rain forest is surrounded by acres of soybean crops in Brazil's Mato Grosso state. Used to make biofuels, the soybeans are hampering the local recovery of the Amazon's expansion

365

Days one person could be fed on the corn needed to fill an ethanol-fueled SUV

\$100 billion

Estimated size of 2008 ethanol market

750,000

Acres of Brazilian rain forest lost in the last six months of 2007 (equal to the area of Rhode Island)

Biofuels Smear Campaign

To: Scott Faber, Grocery Manufacturers Association
From: Glover Park Group
Date: March 6, 2008
Re: Food and Fuel Campaign RFP

Thank you for the opportunity to present this proposal for services.

The unintended consequences of America's current corn-based ethanol policies have led to increased focus and attention. Already, independent-minded organizations, news media leaders and policy makers are recognizing the threat to the food security of Americans and vulnerable populations.

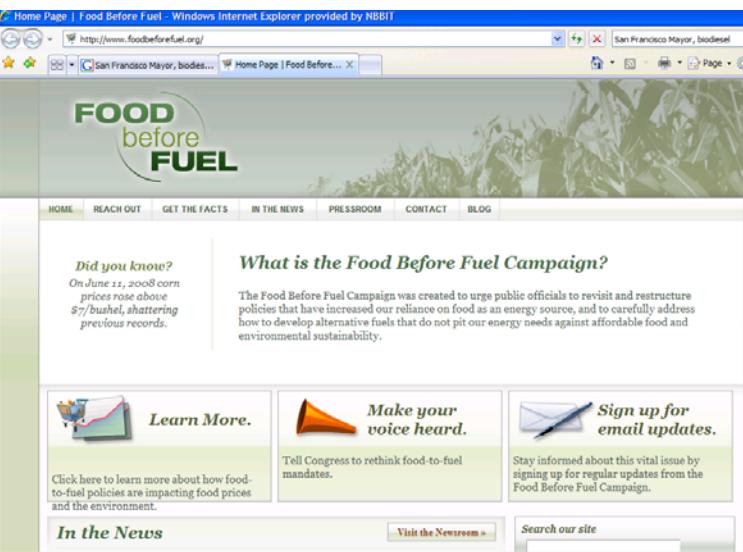
In this environment, a federal agency-level or legislative solution is needed. Environmentally and socially untenable ethanol policies now in place. A range of options exist to help alleviate the problem. Examples include legislation eliminating or updating of the biofuels mandate, ending the ethanol tariff and possibly shifting revenue from the blender tax credit to other programs. At the same time, state governments looking to take action in the absence of clear federal leadership (or under the sway of populist politicians) may soon establish undesirable policies, while other states may be reforming existing policies.

We therefore have a window – albeit brief – to intervene and contain the damage before the impacts become too great. Our opportunity and the

- ▶ Grocery Manufacturers Association (Cal Dooly)
- ▶ \$15m PR campaign with Glover Park Group

Stated Goal: revisit biofuels policies to contain rising food costs

Unstated goal: divert negative attention about record profits during record prices



Food Companies' Profits Soaring Result of Food Price Increases



Kraft Foods

- \$732 Million Quarterly (April–June) Profit
- Raised prices overall by 7 percent

Sara Lee



- \$242 Million Quarterly Profit
- Net sales increase of 10 percent

Historic Quarterly Profits Matches Historic Oil Prices



The Record (2nd Quarter 2008) : \$11.68 Billion

Exxon's Excellent 2007

- Profit \$40.6 billion
- Every second of every day: \$1,287 of profit
- Exxon's 2007 profits of \$404 billion, exceed the gross domestic product of 120 countries.

Chevron's 2007

- Annual profit of \$18.7 billion in 2007
- Fourth consecutive year that they made record profits

Biodiesel and Food

- ▶ Biodiesel can be made from a wide variety of feedstocks including inedible and waste materials. More inedible feedstocks in devel.
- ▶ Soy currently predominant feedstock. 80% of soybean processed into meal for food & feed
- ▶ Sending economic signals to agriculture and plant science research. Soy could provide an additional 2B gallons of oil by 2015 without adding a single acre and with less inputs



Biodiesel and Food



- ▶ According to United Nations Food and Agriculture Organization (FAO), of the land available for agricultural use, only 3.7B acres of the 10.4B is in production, and of that only 1% is used for biofuels including ethanol.
- ▶ Agricultural policies which aim at keeping food and grain prices lower, hamper agricultural development efforts in developing countries and result in less food.

Biodiesel and Food

- ▶ According to DOE and USDA, the most significant cause of food price inflation is increased energy prices. Crude oil has risen by 300% in 4 years.
- ▶ In 1974, when fuel prices rose to their second highest mark, significant food price inflation occurred. Biofuels were not around to blame. According to the Bureau of Labor statistics, adjusted for inflation, fuel prices are approx 30% higher today than they were in 1974, but grain prices are about half the price today compared to '74.
- ▶ According to Meryl Lynch strategist and others, without the 8B gallons of biofuels in the fuel supply, fuel prices would be as much as 15% higher making food prices even higher



Biodiesel and Sustainability



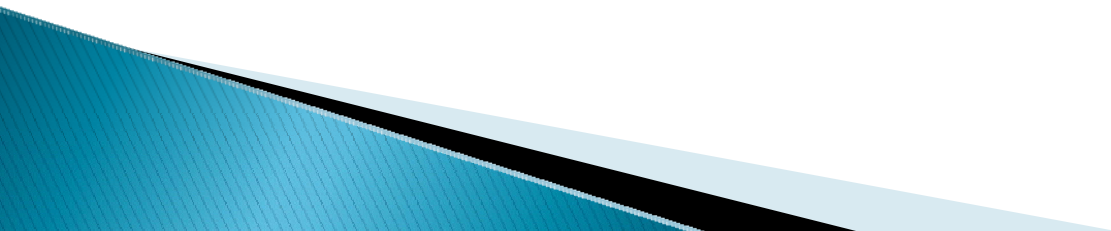
Sustainability defined: Meeting today's needs for environmental stewardship, economic prosperity, and quality of life without compromising future generations' ability to meet these needs for themselves.

The concept of utilizing resources in a way that can be sustained indefinitely is not a new idea, but it is one that is justifiably receiving increased attention in today's public discourse. Biodiesel, like all other renewable energy sources was developed specifically to enhance the sustainability of our use of energy resources. Petroleum is a finite resource. Continuous and increased depletion of this resource as a transportation fuel is therefore by definition non-sustainable. This has been evident virtually since the beginning of petroleum's dominance as an energy source. Visionary leaders such as Rudolf Diesel, Henry Ford, and George Washington Carver, recognized that petroleum was not sustainable and devoted a significant amount of time and effort toward the development of renewable energy through sustainable agriculture.

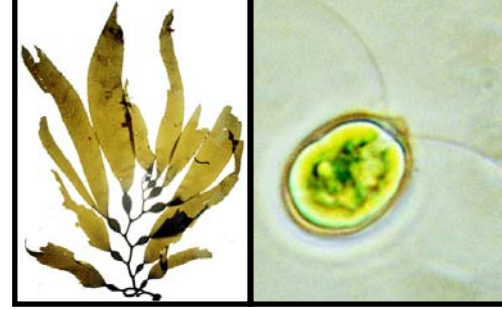
Biofuels in general, and biodiesel specifically, along with energy conservation and an array of other fuels and strategies, offer significant opportunities to enhance the sustainability of our use of energy resources.

This section is devoted to providing the facts and data relative to the many individual, and complex issues that fall under the umbrella term of "sustainability". These issues include Food and Fuel, deforestation, global warming, health/environmental impacts.

NBB Feedstock Program

- ▶ Support private equity investment in near term opportunities
 - ▶ Advocate a development program focused on.....
 - Algae
 - Non-edible feedstocks
 - Feedstocks that can be grown on under-utilized acreage
 - Virtual acres of existing oilseeds
- 

Algae



- ▶ Several production pathways being pursued
 - Open Ponds
 - Bioreactors
 - Enzymatic Fermentation
- ▶ Very little biodiesel to date has been made from algal lipids
 - Several algae production companies have indicated that the biodiesel that has been produced will meet the ASTM D6751 specification.
 - Oil quality appears to vary significantly between algae species.
- ▶ Oil production potential estimates range from 2,000 gallons per acre to the absurd.

Research Needs & Issues

▶ Near term

- Support of commercialization efforts through economic development tools (federal loan guarantees, etc.)

▶ R&D

- Improving production processes to lower production costs
- Algae harvesting & dewatering
- Oil separation technology
- Strain identification for optimal oil production and fatty acid profiles
- Recommend re-establishment of a comprehensive federal algae program to address commercialization



Questions?