Biodiesel—Market Status and Potential for California

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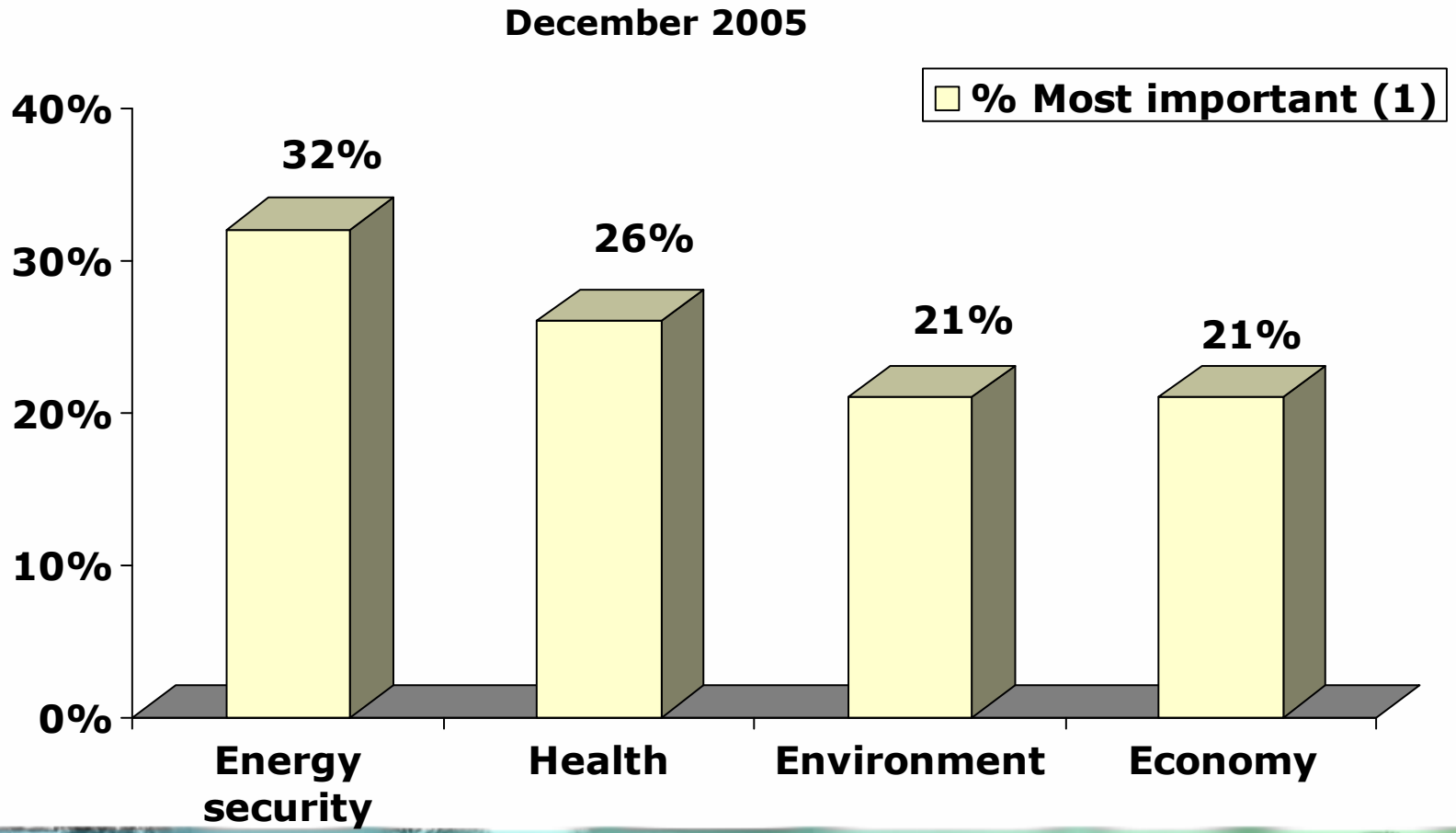
and
Technical Director, National Biodiesel Board

Biodiesel Forum and Technology Round Table
November 7, 2006
South Coast Air Quality Management District

Ranked Importance of Biodiesel Benefits for U.S. Consumers



BIODIESEL

TM by the National Biodiesel Board

Biodiesel Industry Status

- Federal Political Support is Fully Engaged and Setting the Stage
  - Federal Tax Credit passed
  - Federal Tax Credit extended once
  - Plans in place to extend it again

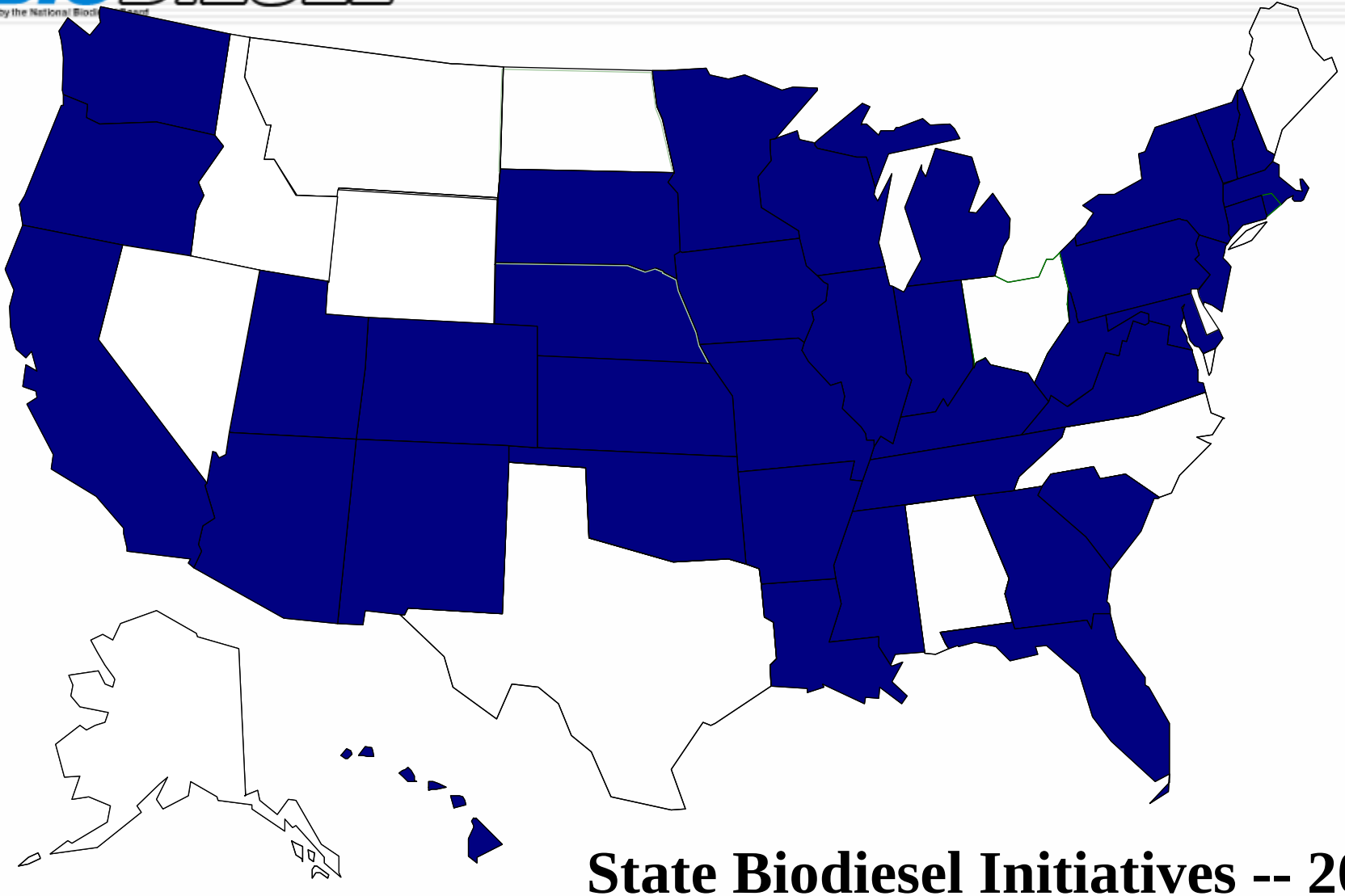
- Renewable Fuel Standard is in Place
  - 7.5 Billion gallons (ethanol, biodiesel) by 2012

State Policies In Place

- **IL**-State Sales Tax Reduction/Exemption.
- **MN**-B2 Requirement.
- **IN**-Producer, Blender, Retailer Tax Credits.
- **PA**-Producer Incentive; School/City Use Reimbursement.
- **MO, KY, MS, ND, SD, TX, AR**-Production Incentives.
- **WA**-Production, Distribution Incentives.
- Several States-State Fleet Use/State Excise Tax Reduction.

Strong Momentum

- States are increasingly taking proactive steps to implement policies to enhance the use of biofuels.
  - 2004 130 biodiesel specific bills 27 passed (30% increase over 2003)
  - 2005 170 biodiesel specific bills 31passed (37 states)



State Biodiesel Initiatives -- 2006

Increasing OEM Support

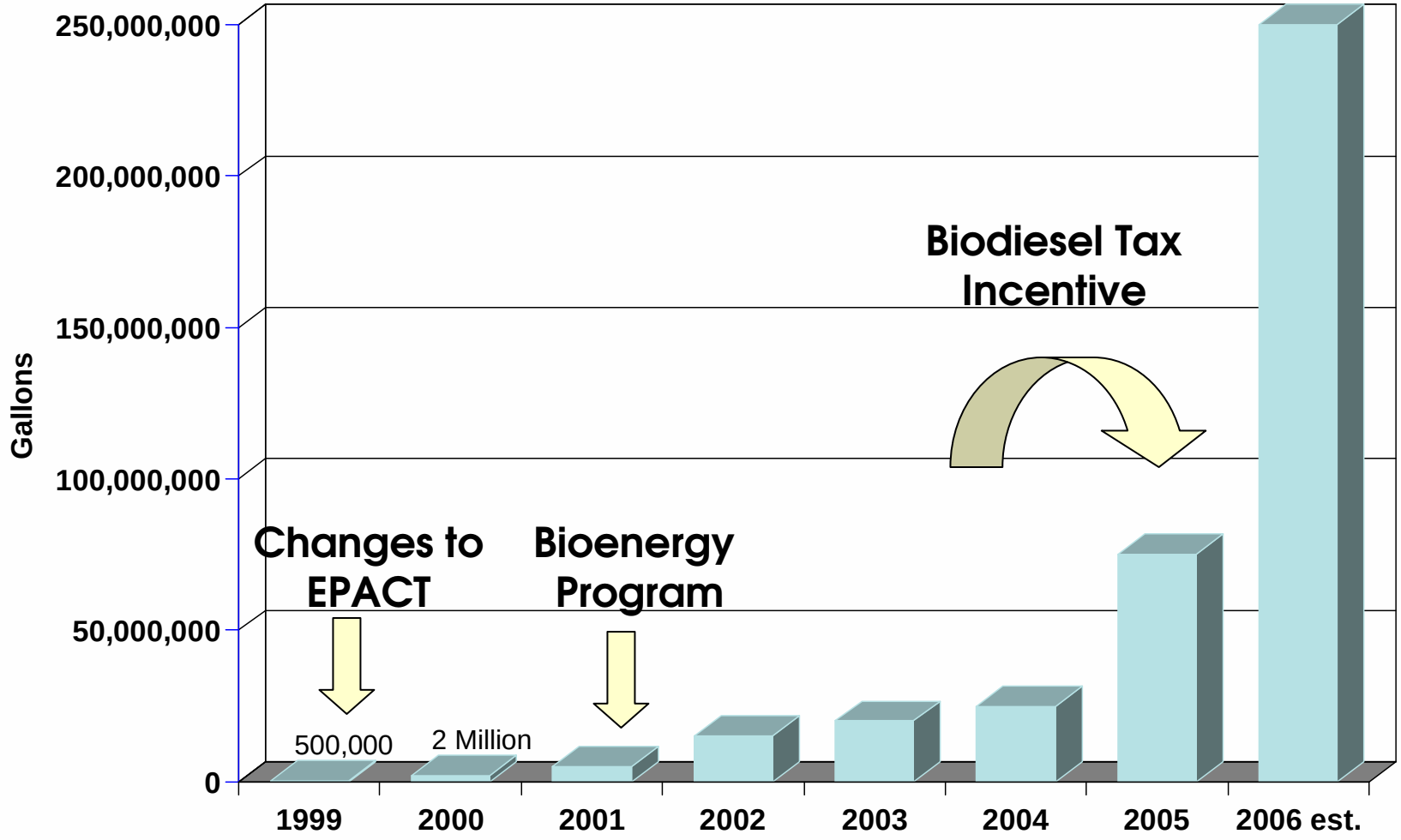
- Diesel powered Jeep Grand Cherokee CRD to have B5 factory fill
- New Holland approves B20 in all of its diesel engines
- DaimlerChrysler approves B20 in 2007 Dodge Ram pickup's used in fleets
- GM working towards B20
- EMA approves a B20 test specification
- ASTM blended fuel specs being balloted for December 2006

Other Exciting Developments

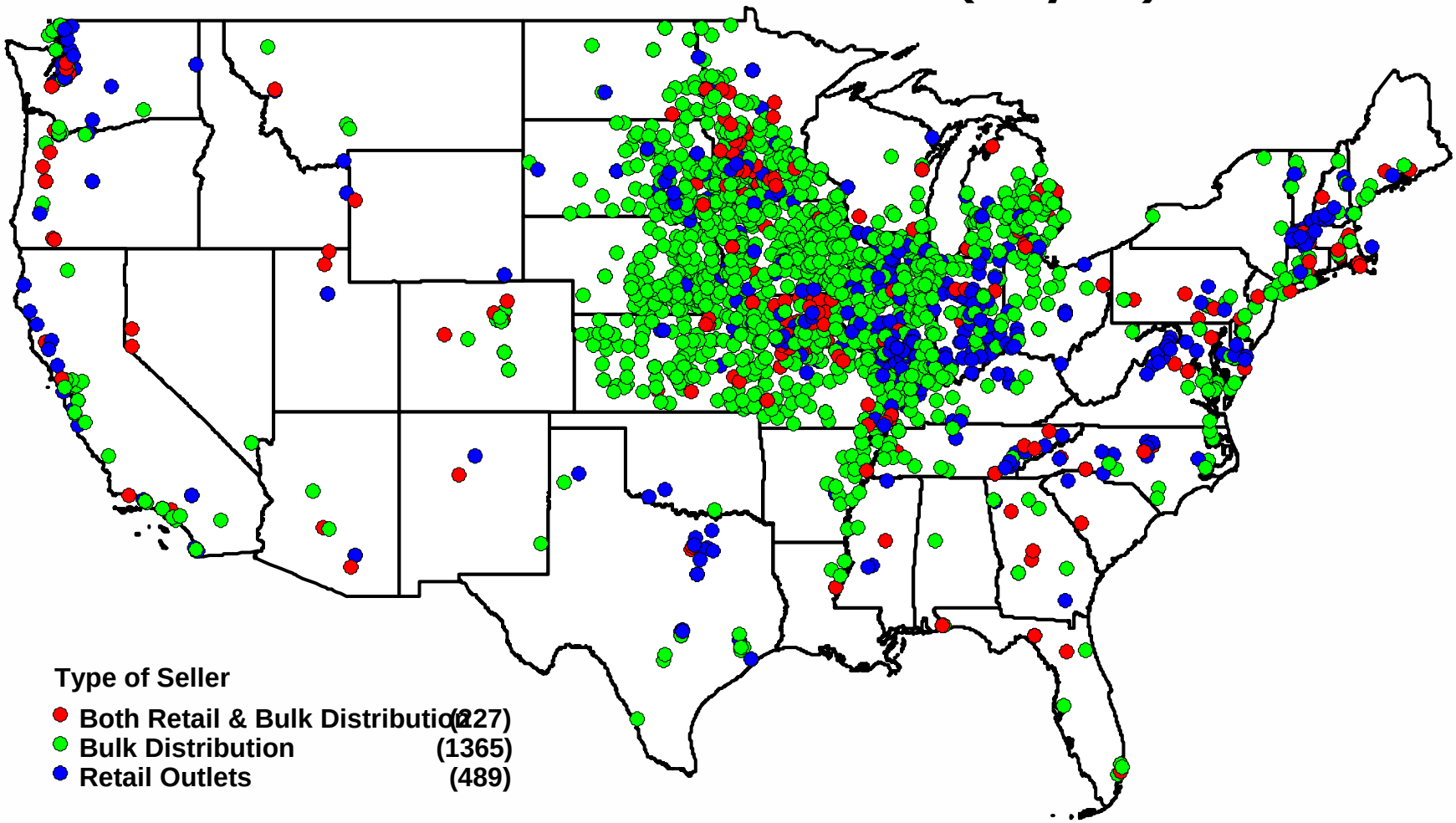
- John Deere Factory Fill
  - B2 in all North American Equipment
  - Phased in 2005 by location
- Neil Young, Willie Nelson
  - "Bio Willie" Biodiesel Sales Company for Truckers
  - Biotrucker.com Website
- Many other singers and artists using B20 in tour buses and equipment

US Biodiesel Demand

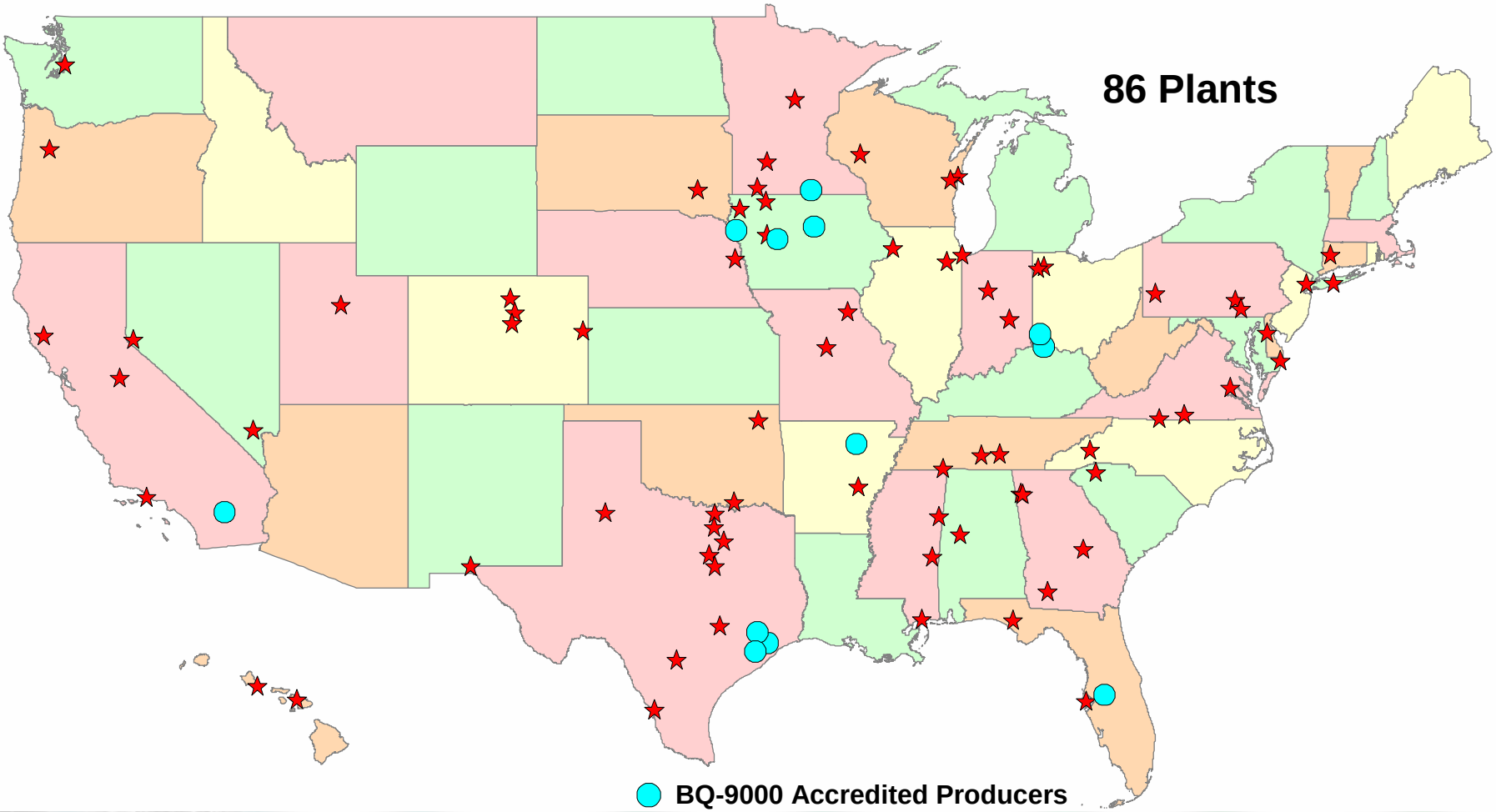
(gallons per year)



Distribution Locations (May 06)



Production Locations (9/13/06)

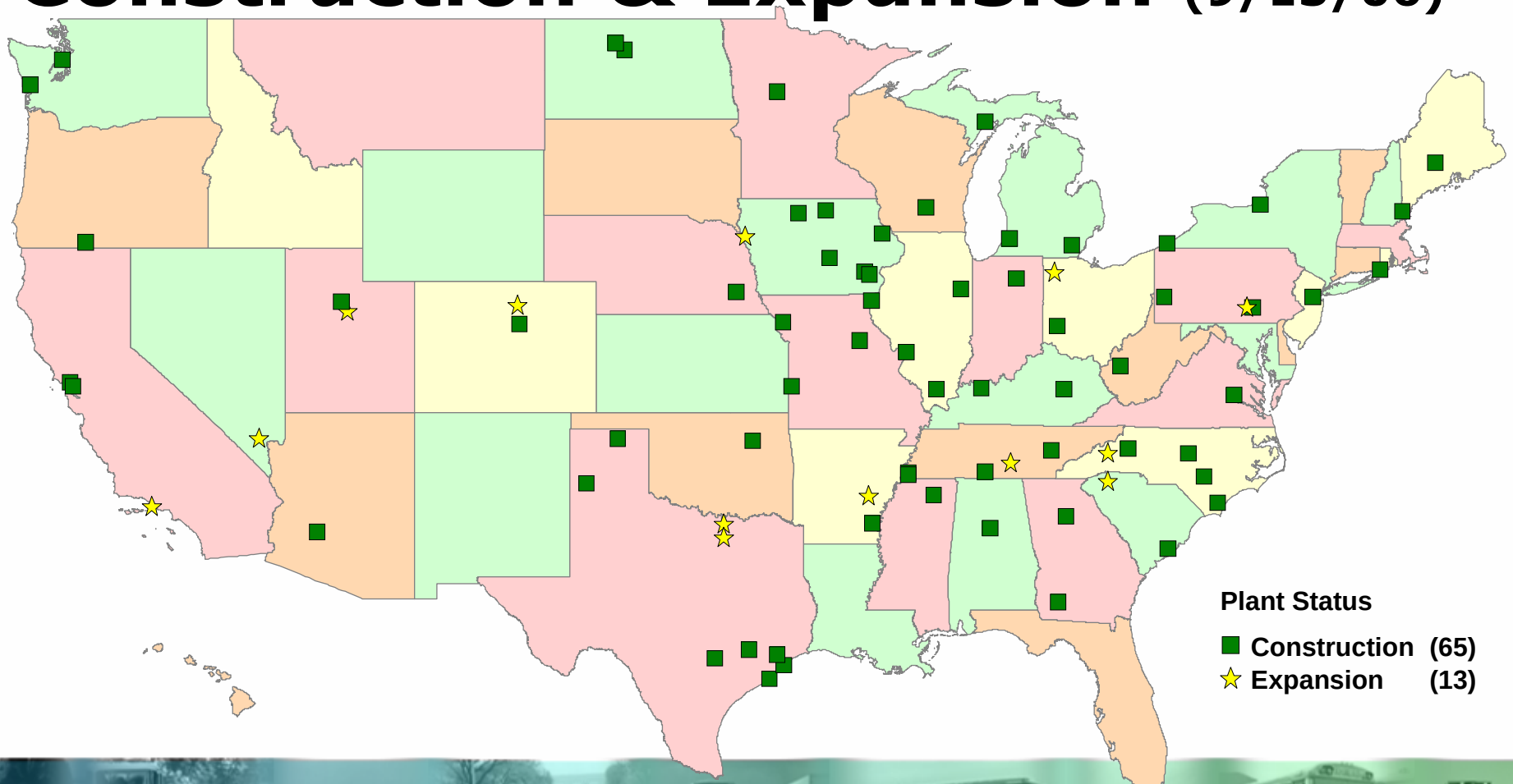


Biodiesel Plant Size

Plant Size (gallons per year)	# of Companies (86 total)
< 1,000,001 (3,333 mt)	21
1,000,001 – 5,000,000	34
5,000,001 – 10,000,000	15
10,000,001 – 15,000,000	6
15,000,001 – 20,000,000	2
>20,000,000 (67,000mt)	8

Industry Capacity 580 million gallons per year (1.9MMT)
Avg Plant Size 6.7 million gallons per year (22,330MT)

Biodiesel Plants Under Construction & Expansion (9/13/06)



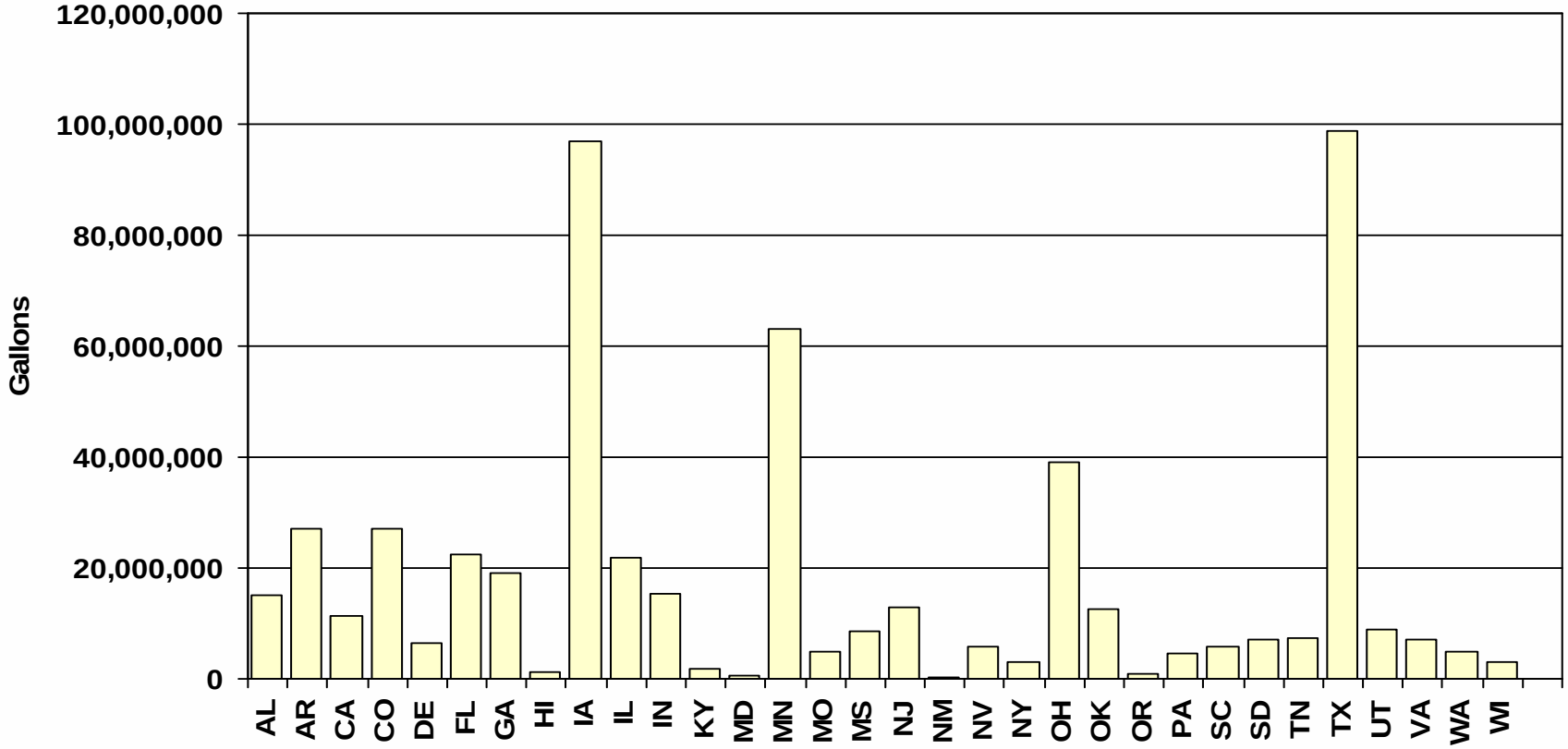
Construction/Expansion

Plant Size (gallons per year)	# of Companies (78 total)
< 1,000,001 (3,333 mt)	11
1,000,001 – 5,000,000	18
5,000,001 – 10,000,000	15
10,000,001 – 15,000,000	5
15,000,001 – 20,000,000	3
>20,000,000 (67,000mt)	26

Construction Capacity 1.4 billion gallons per year (4.6mmt)
Avg Plant Size 17.9 million gallons per year (56,660mt)

Production Capacity by State

(Preliminary as of 8/28/06)

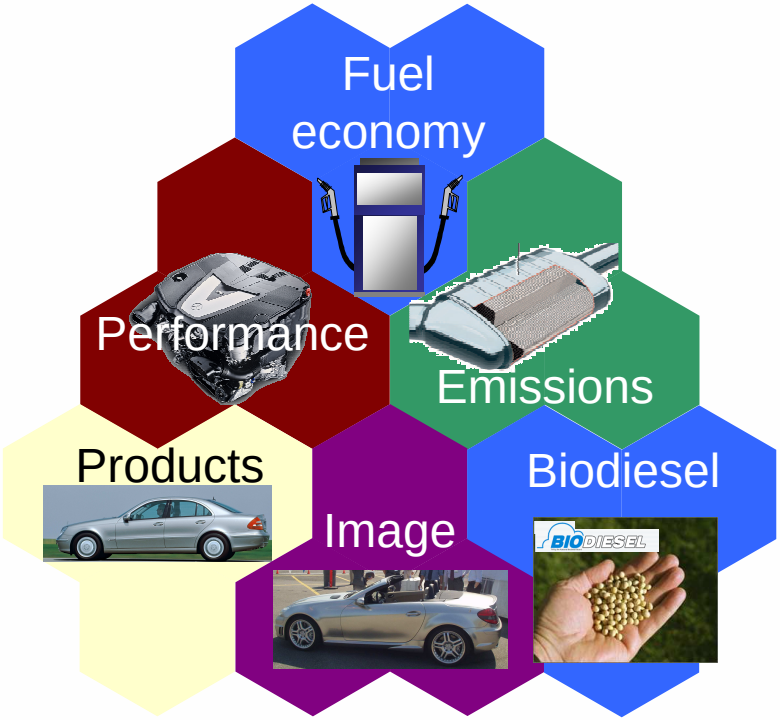


Key Opportunities--Biodiesel

- Ultra Low Sulfur Diesel Fuel
  - Lubricity, sulfur
  - Cetane may be a bigger benefit in the future
- New Engine Technology and After Treatment
  - B20 may perform better in Particulate Traps
  - NOx technology will reduce NOx concerns
  - Diesel engines will be 90% cleaner than today
  - Diesel engines running on B20 will be the 'clean green' engine platform of the immediate future

The Diesel Package

- All these elements together will drive the diesel market in the short, medium and long term



American Lung Association Slide Presentation Sept 8, 2006 courtesy of:

DAIMLERCHRYSLER

Key Opportunities--Biodiesel

- Energy Balance
- Life Cycle CO_2 reduction
- Standards and Regulations
  - Existing data & approvals in place
- Ground level ozone may not be controlled by NOx—hydrocarbons may be more important
- Incentives and high petroleum prices

Key Challenges--Biodiesel

- Maintaining and Building OEM Support
  - Updating specifications
  - Continue real world data collection

- Insuring Fuel Quality
  - As produced
  - As delivered
  - As used by the customer

Key Challenges--Biodiesel

- Confirm B20 effects on new engines and after-treatment
- Testing and certifications for 'non traditional' markets
  - Railroads, gas turbines, boilers, home heat

Key Challenges--Biodiesel

- Education and Training
  - New biodiesel companies
  - Users
  - Engine, FIE, and vehicle companies
  - Petroleum refiners
  - Petroleum pipelines and terminal
  - Petroleum jobbers and distributors
  - Industry influencers and politicians
    - Get up to speed, don’t over promise

Detailed Biodiesel Needs

- US DOE, USDA, National Biodiesel Board Technical Workshop on Biodiesel Priorities
  - November 2005 Results Available
  - November 2006 Workshop Nov 7-9, 2006
- B20 Summit, DaimlerChrylser/Next Energy, May 2006
- US DOE Analysis of Biodiesel Technical and Industry Needs, In Progress

National Biodiesel Board Vision: July 2006

- To increase the demand for commercially produced biodiesel in the United States through education, communication, and quality assurance programs and by serving as the national coordinating entity and clearinghouse of information
- Goal: Volume equal to 5% of on road diesel fuel use in the USA by 2015 (1.85 billion gallons/yr)
  - 5% = diesel refined from Iraqi crude
  - 5% = ¼ of diesel equivalent refined from Persian Gulf crude

Biodiesel: U.S. Looking Forward

- NREL Biomass Oil Analysis: Research Needs & Recommendations, June 2004
- Current Potential: 1.7 Billion gal/year
- Near-Term Potential: (2015): 3.5 Billion
- Long-Term Potential: (2030): 10 Billion

Report of the Biodiesel Workgroup

CA Energy Commission

October 12, 2004

Sacramento, CA

Biodiesel: CA Looking Forward

Base Case Assumptions

- Finalize additional ASTM fuel specs.
- Develop integrated state policy supporting biodiesel use.
- Federal biodiesel incentives.
- Collaborate with industry to optimize biodiesel performance.

Biodiesel: CA Market Projections

Base Case

(Gallons/year)	Diesel	B100	% Redux
2010	3.3B	10-30M	1%
2020	3.84B	40-80M	2%

Biodiesel: CA Looking Forward

Aggressive Scenario Assumptions

- Incorporate Base Case Scenario actions & assumptions.
- Aggressively address incremental costs:
  - Extend/expand federal tax incentives that encourage higher blend availability at the rack.
  - Implement favorable state tax policies that attract more oleochemical/biodiesel production.
- Support a national or state renewable fuel standard.
- Incorporate higher blends across the entire state diesel pool.

Biodiesel: CA Market Projections

Aggressive Case

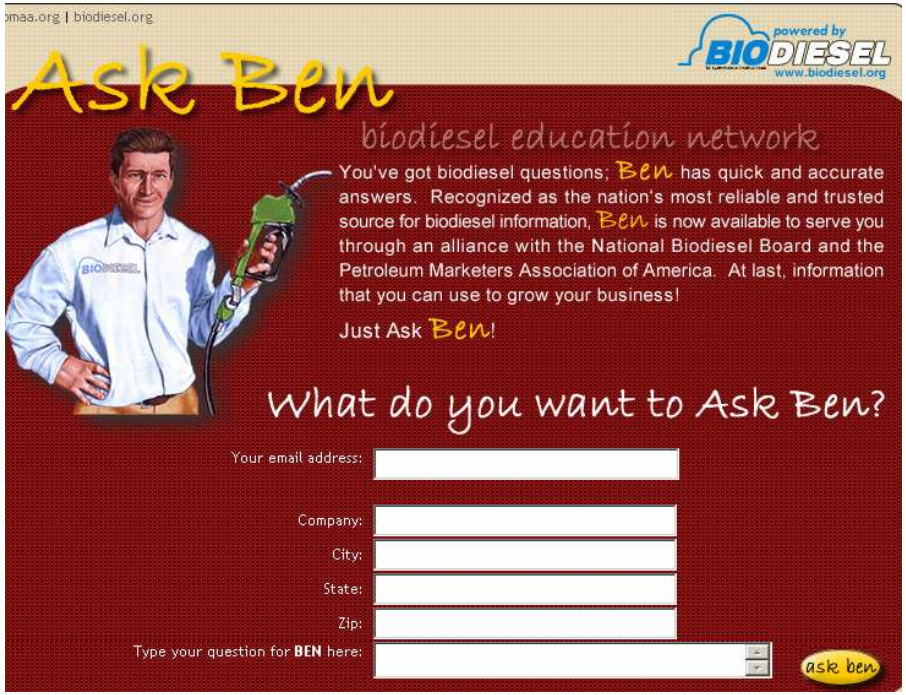
(Gallons/year)	Diesel	B100	% Redux
2010	3.3B	35-65M	2%
2020	3.84B	300-700M	18-20%

Biodiesel: Conclusion

- Biodiesel is the fastest growing alt. fuel in the US because it is simple and transparent.
- As proven in Europe, and b/c of its versatility, biodiesel has tremendous potential to displace petroleum gals. w/o displacing existing petroleum businesses.
- Aggressive public policy support for biodiesel will help maximize its potential in California.

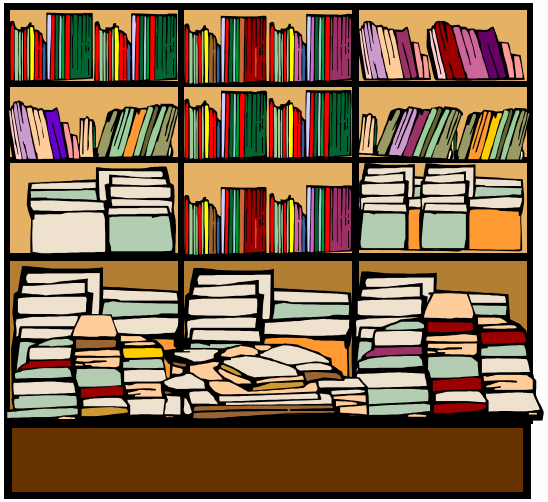
Educational Resources

- BEN: Biodiesel Education Network
- Web-based resource specifically for petroleum marketers
- Partnership between NBB/PMAA
- www.pmaa.org
- www.biodiesel.org



NBB Resources

- www.biodiesel.org
- Technical Library
- Biodiesel Bulletin
- Educational Videos Available
- Informational Resources
- Technical Resources
- On-line Database & Spec Sheets



Other web sites:

- www.nationalbiodieseleducation.org
- www.nationalcleancities.org

Other Biodiesel Resources

- www.bbibiofuels.com
- Biodiesel Magazine
  - A **MUST HAVE'** magazine
- Biodiesel Industry Directory On-Line