



Virginia Biodiesel Workshop
Old Dominion University
June 16, 2010

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These workshops made possible by a grant from the soybean checkoff

Agenda



12:00 Lunch

12:30 Program

- Biodiesel Intro and Overview
- State of the Biodiesel Industry
- Supply Chain, Use and Implementation
- Quality Control, Specifications and Manufacturer Support
- Incentives and Funding Programs

1:45 Q&A

A Special Thanks To:

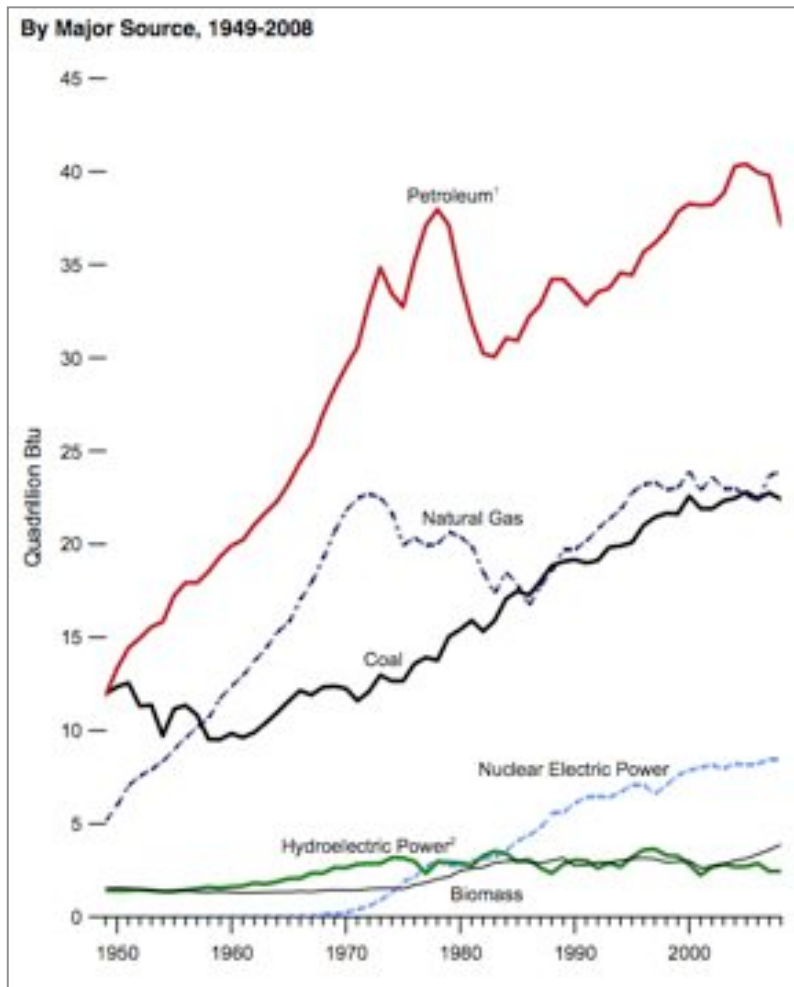
Soybean Checkoff Fund

TAFMA

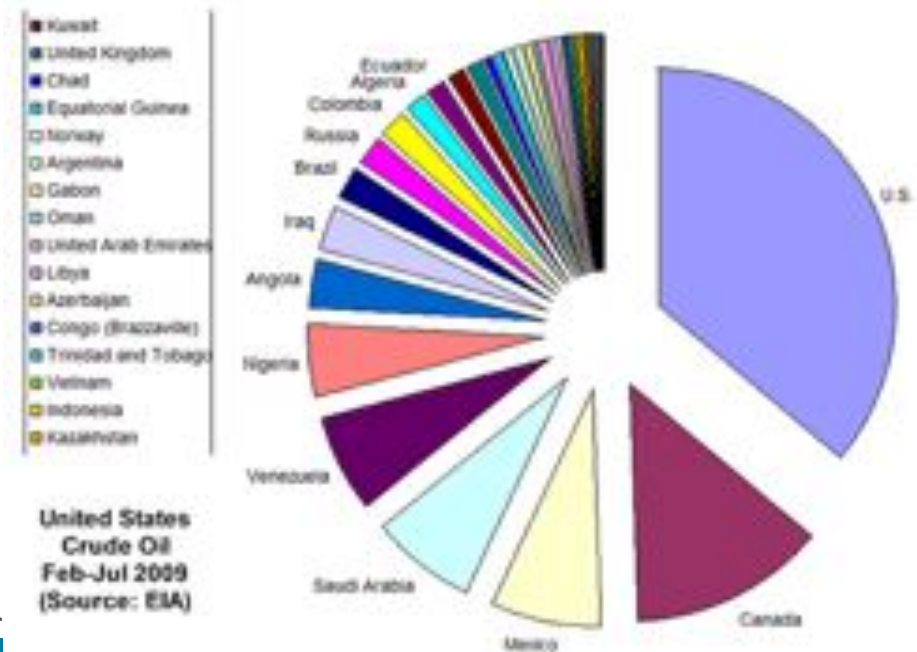
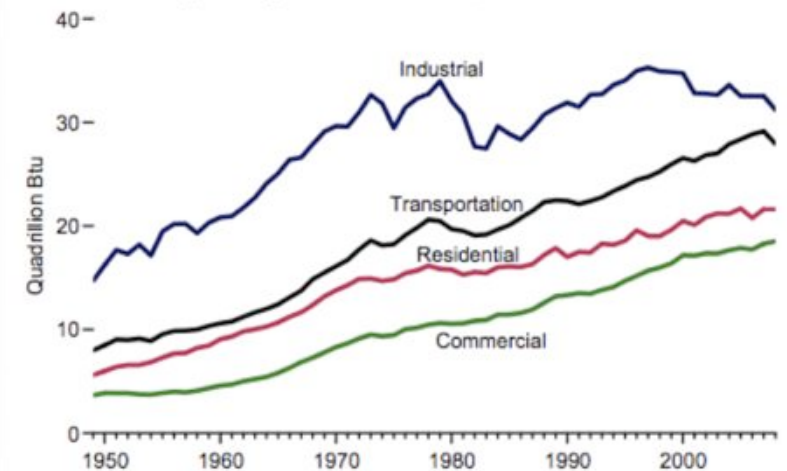
Old Dominion University

National Biodiesel Board - Richard Nelson

U.S. Energy Consumption

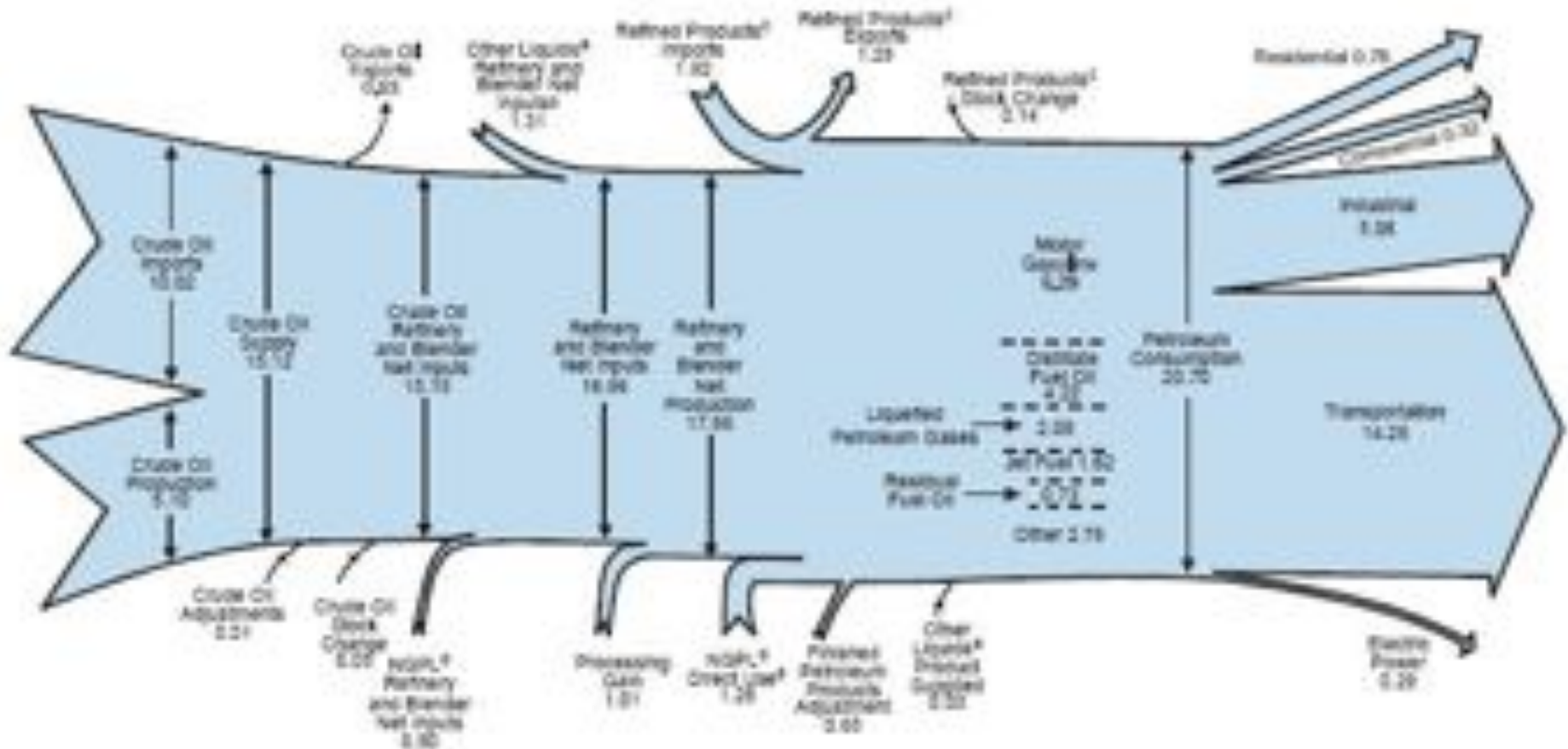


Total Consumption by End-Use Sector, 1949-2008



Source: [Annual Energy Outlook 2009](#). Energy Information Administration.

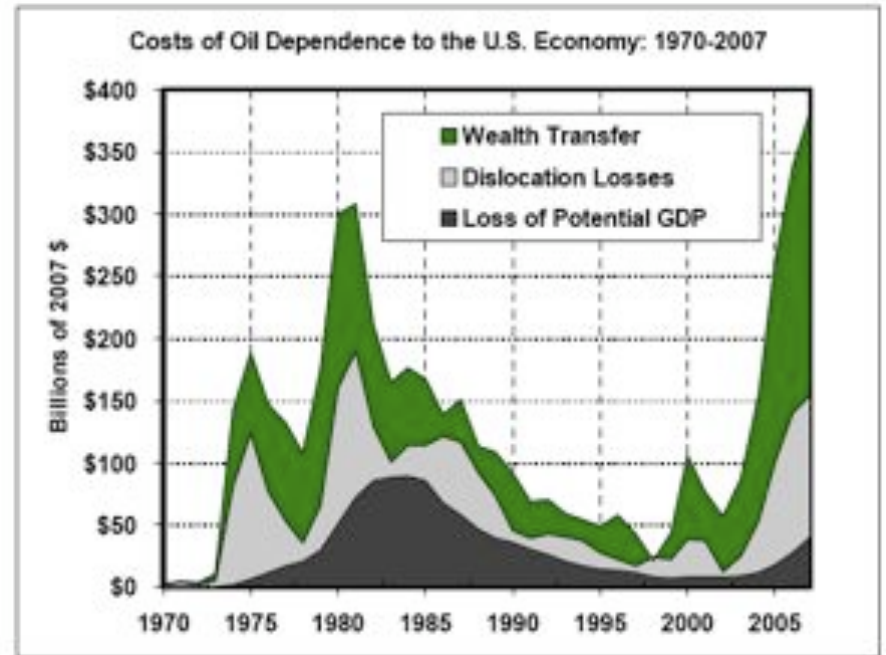
U.S. Petroleum Flow



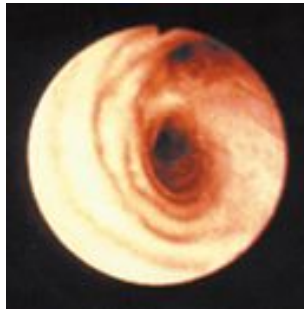
Source: Annual Energy Outlook 2009. Energy Information Administration.

Why Does it Matter?

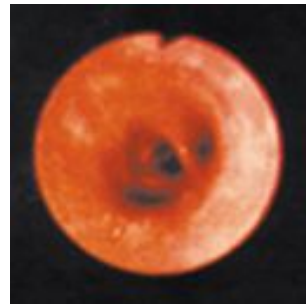
- 2007 economic costs of oil dependence estimated to exceed \$350B
- Households spending \$3,000/year on fuel + 60% is imported = \$1,800 transfer of individual wealth to oil exporting countries
- Strong links between anthropogenic emissions and climate response
- Strong policy actions following shocks of 1973-74 and 1979-80 helped cut imports



NORMAL LUNG AIRWAY



INFLAMMED LUNG AIRWAY



OZONE DAMAGED PLANT



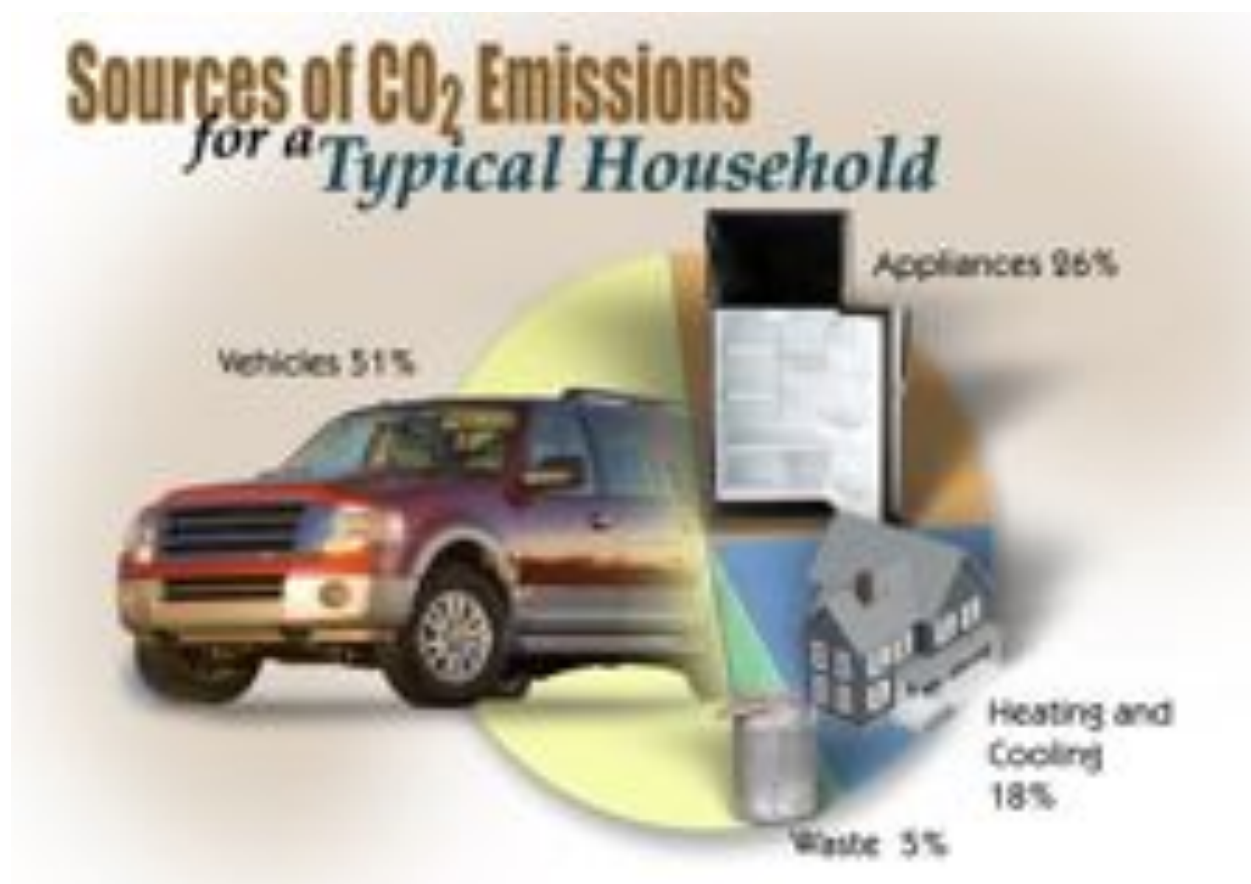
NORMAL PLANT



Sources: Top R: Greene, David. Facing the Challenge of Oil Dependence and Climate Change: What Will it Take. http://www-cta.ornl.gov/cta/staff_GreeneDL.shtml
Bottom L: EPA AirNOW. http://www.airnow.gov/index.cfm?action=ozone_health.page1 / Bottom R: Photo courtesy NARA, photographer Gene Daniels/U.S. EPA

Personal Impacts

The vehicles we drive release over 1.7 billion tons of CO₂ into the atmosphere each year, contributing to global climate change. Each gallon of gasoline you burn creates 20 pounds of CO₂. That's about 6 to 9 tons of CO₂ each year for a typical vehicle.



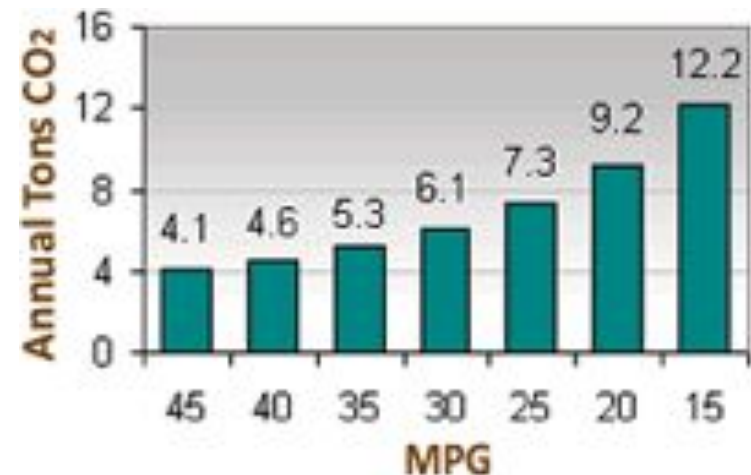
Source: Fueleconomy.gov, <http://www.fueleconomy.gov/feg/climate.shtml>

What Can You Do?



- Buy Smarter - Choose cars that get better gas mileage
- Drive Smarter - ~~Get the best fuel economy out of your car~~
- Fuel Smarter - Use lower carbon fuels, renewable & non-petroleum based fuels
- Plan Your Day Smarter - Walk, bike or take transit more often, trip-chain

- *There is a program dedicated to advancing these decisions!!*



Source: Fueleconomy.gov_<http://www.fueleconomy.gov/feg/climate.shtml>

Clean Cities:

A voluntary, locally-based government/industry partnership



Mission: To advance the energy, economic, and environmental security of the U.S. by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption in the transportation sector.

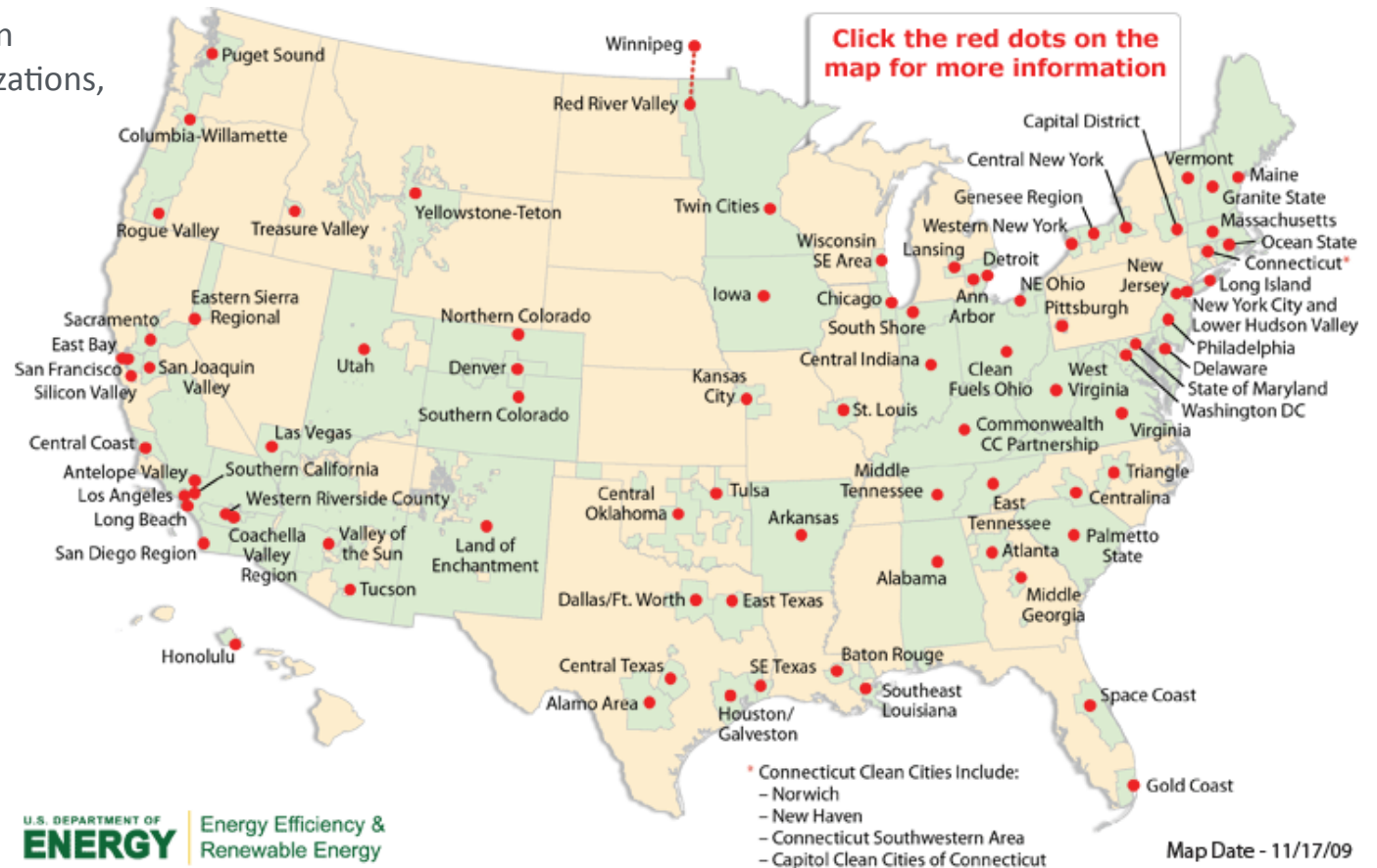
- Established in 1993 in response to the Energy Policy Act (EPAct) of 1992
- Companion program to the EPACT mandates requiring certain fleets to acquire AFVs (Federal, State, and Fuel provider fleets)
- Focus on **Deployment** (next steps after R&D is completed)
- Fuel neutral / technology neutral
- Celebrated 15 Year Anniversary in 2009

Clean Cities: About the Program



Established a National Network of Coalitions

- ~100 coalitions & partnerships
- > 5,700 stakeholders from businesses, city & state governments, transportation industry, community organizations, fuel providers
- Coalitions cover > 78% of population



- Virginia Clean Cities est. 1996 (originally “Hampton Roads Clean Cities”), coalition covers entire state
- 501(c)3 not-for-profit
- James Madison University partnership, Office on campus
- Currently managing 11 alternative fuel deployment and education programs on behalf of fleets and other stakeholders totaling ~ \$24M Tot/\$11M Fed
- Example Activities:
 - Southeast Propane Autogas Development Program
 - Green Operators (GO) Program with Virginia Port Authority
 - Facilitator, Get Ready Virginia (Virginia’s EV readiness activities)
 - Pilot programs to measure new technology impact on petroleum displacement and emissions (idle reduction, propane buses)
 - Biodiesel grant program
 - Hydrogen Education for Decision Makers Initiative
 - Propane school bus and natural gas waste hauler deployment programs

Biodiesel Recent Points of Significance



- Global economic crisis, trade issues
- Fluctuations in diesel markets
 - From over \$4 to below \$2
- Expiration of blenders tax credit
 - Predictability
 - Feedstock pricing
- RFS2 final rule
- Sustainability questions



What is Biodiesel?

Biodiesel, n. -- *a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100, and meeting the requirements of ASTM D 6751.*



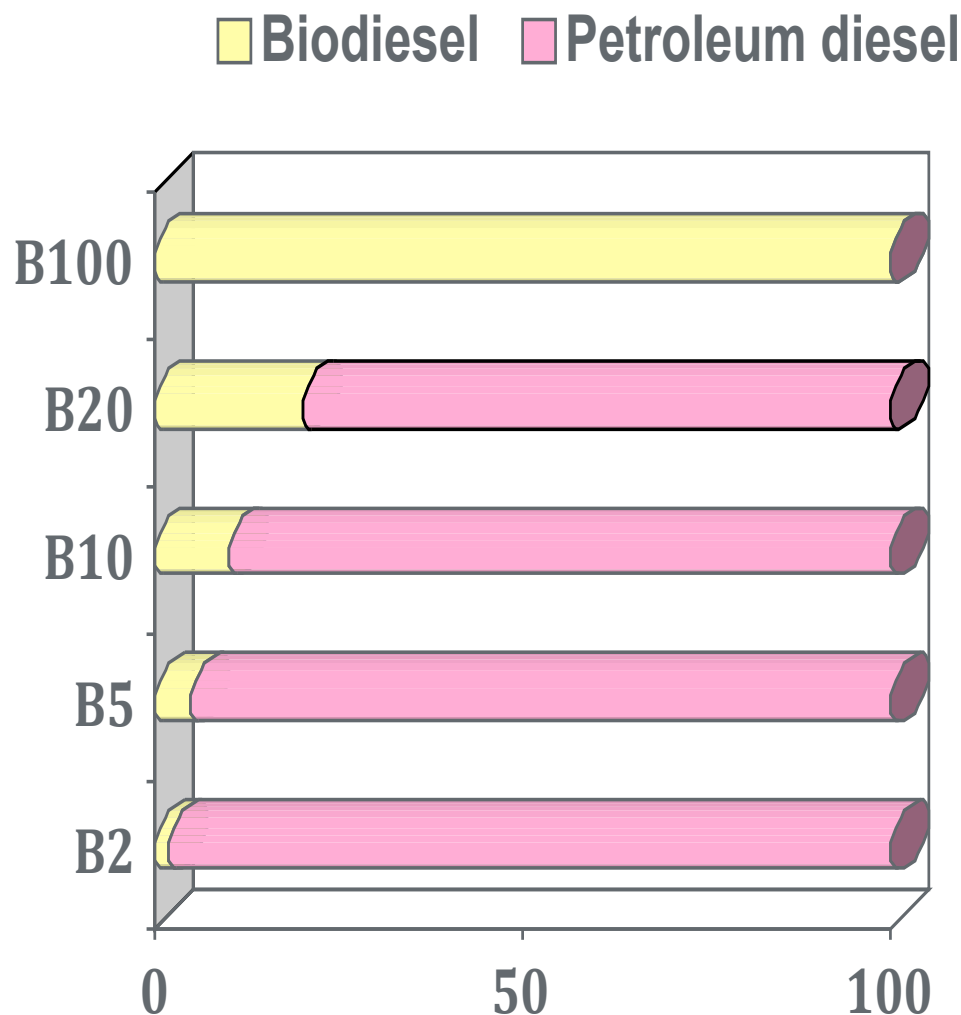
Official IRS and EPA definition – goes to fuel quality.

What is Biodiesel?

Biodiesel can be used in any concentration with petroleum-based diesel fuel in existing diesel engines with little or no modification.

Biodiesel is not raw vegetable oil!

Biodiesel **must** be produced by a chemical process that removes glycerin from the oil.



- **Blends with petrodiesel in any percentage**
 - Once it is blended it does not separate back out
- **Higher Cetane**
 - Over 50 vs. average petrodiesel around 44
 - Smoother, more complete burn
- **High Flash Point Makes it Safer**
 - Non hazardous shipping (over 200° F)
- **Virtually Zero Sulfur**
 - Meets ULSD limits of 15 ppm or less
- **Zero Aromatics Reduces Toxicity**
- **Superior Lubricity with ULSD and Reduces Black Smoke (Particulates)**
- **Potential Cold Flow Concerns**

Emission Type		B20	B2
Total Unburned Hydrocarbons		-20%	-2.2%
Carbon Monoxide		-12%	-1.3%
Particulate Matter		-12%	-1.3%
Oxides of Nitrogen (NO _x)		+/-2%	+/- .2%

MSHA (US Department of Labor – Mining Safety and Health Administration) recognizes biodiesel as the least expensive means for reducing underground worker exposure to DPM – **this is a direct worker health issue**

Biodiesel History

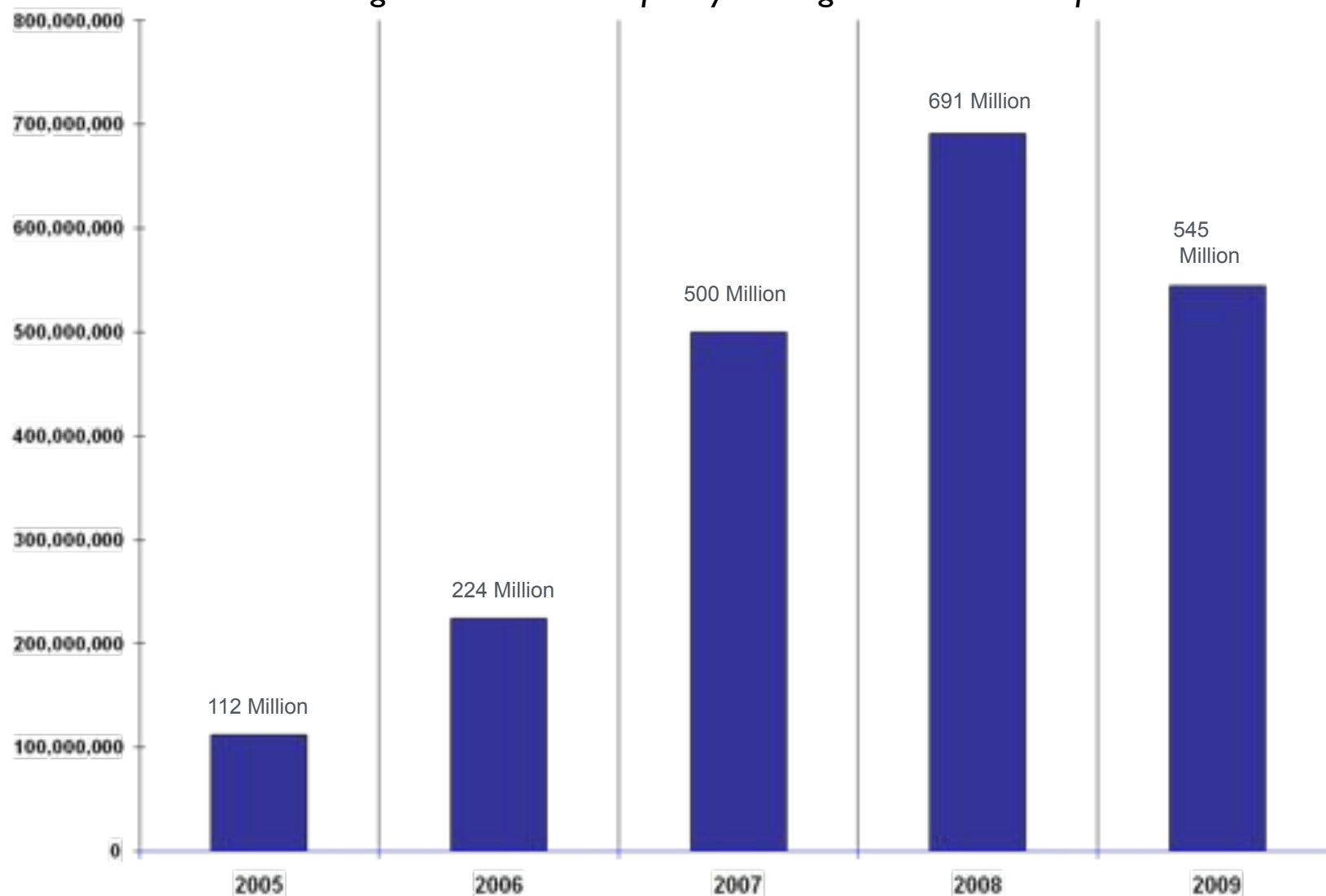


- 1980's: Vegetable oils viable as 'emergency fuel'
- 1992: Soybean farmers invest in biodiesel to utilize excess soy oil and National Biodiesel Board (NBB) formed
 - 70 million gal/year could mean 5-9 ¢/bushel
 - NBB embraces all oil/fat sources for biodiesel
- Invested over \$100M in...
 - ASTM and quality efforts
 - Health Effects Testing
 - BQ-9000

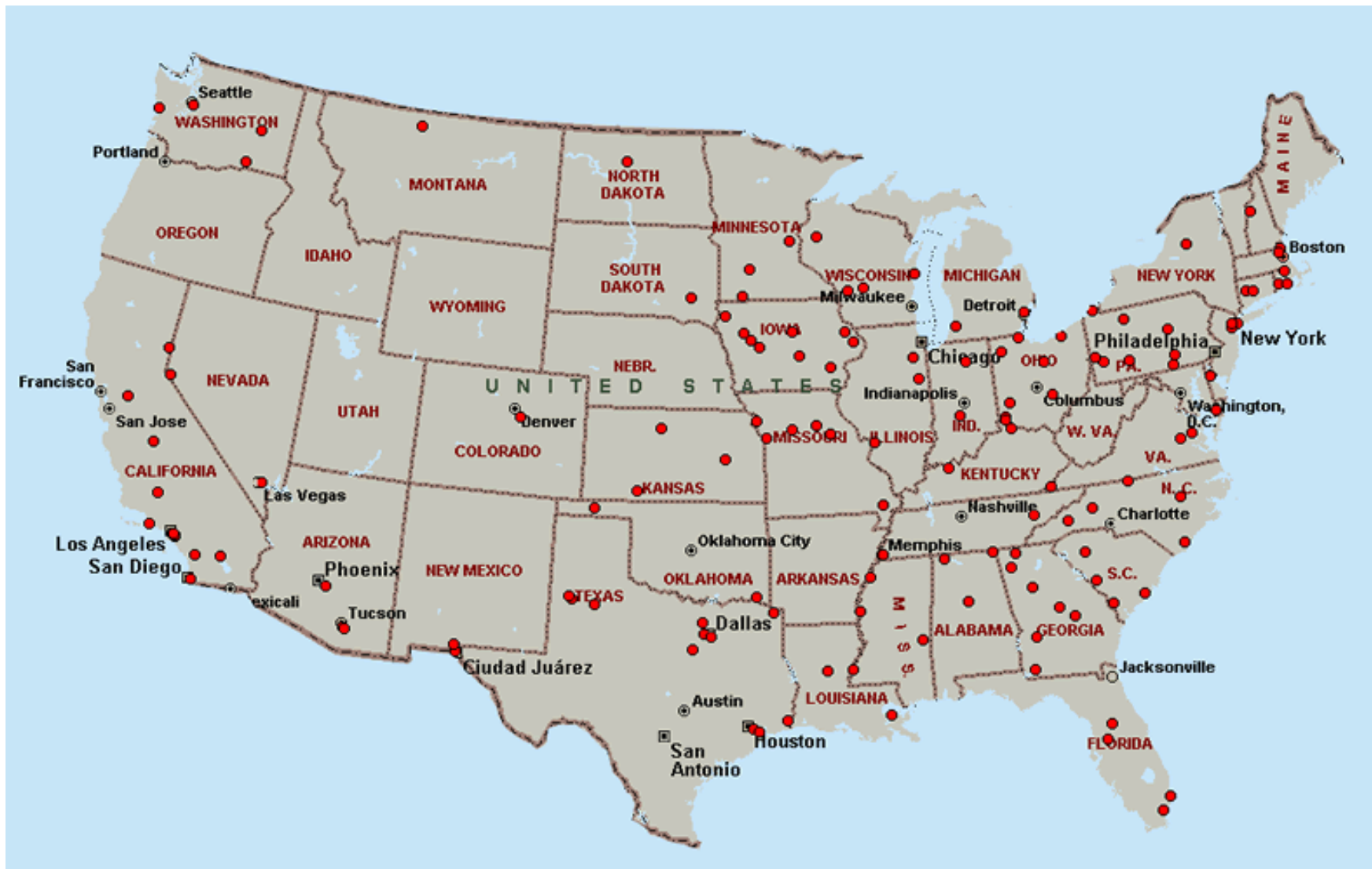
Estimated US Biodiesel Production by Calendar Year



2.737B gallons installed capacity amongst 175 biodiesel plants



Estimated US Biodiesel Production by Calendar Year

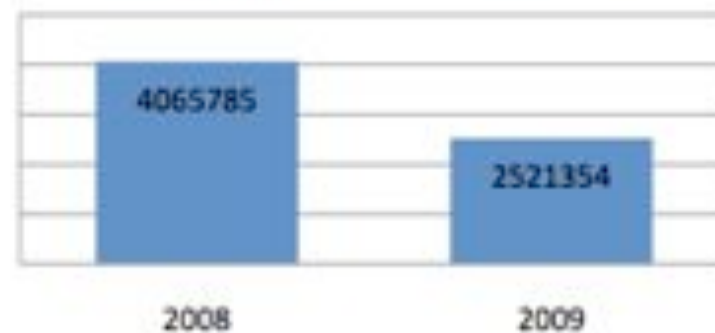


VA Biodiesel Market Status



- VA biodiesel industry produced 4 million gallons of biodiesel in 2008, roughly 18% capacity of five production companies in Virginia and well under 1% of the national production.
- Virginia production of biodiesel declined 38% to 2.5 million gallons in 2009 (11% of capacity)
- As of January 2010, there are 38 public and private biodiesel fueling stations in Virginia and more than 3300 light and heavy duty fleet vehicles, such as school busses and work vehicles in Virginia using biodiesel.
- We are at 8 to 10% capacity now.

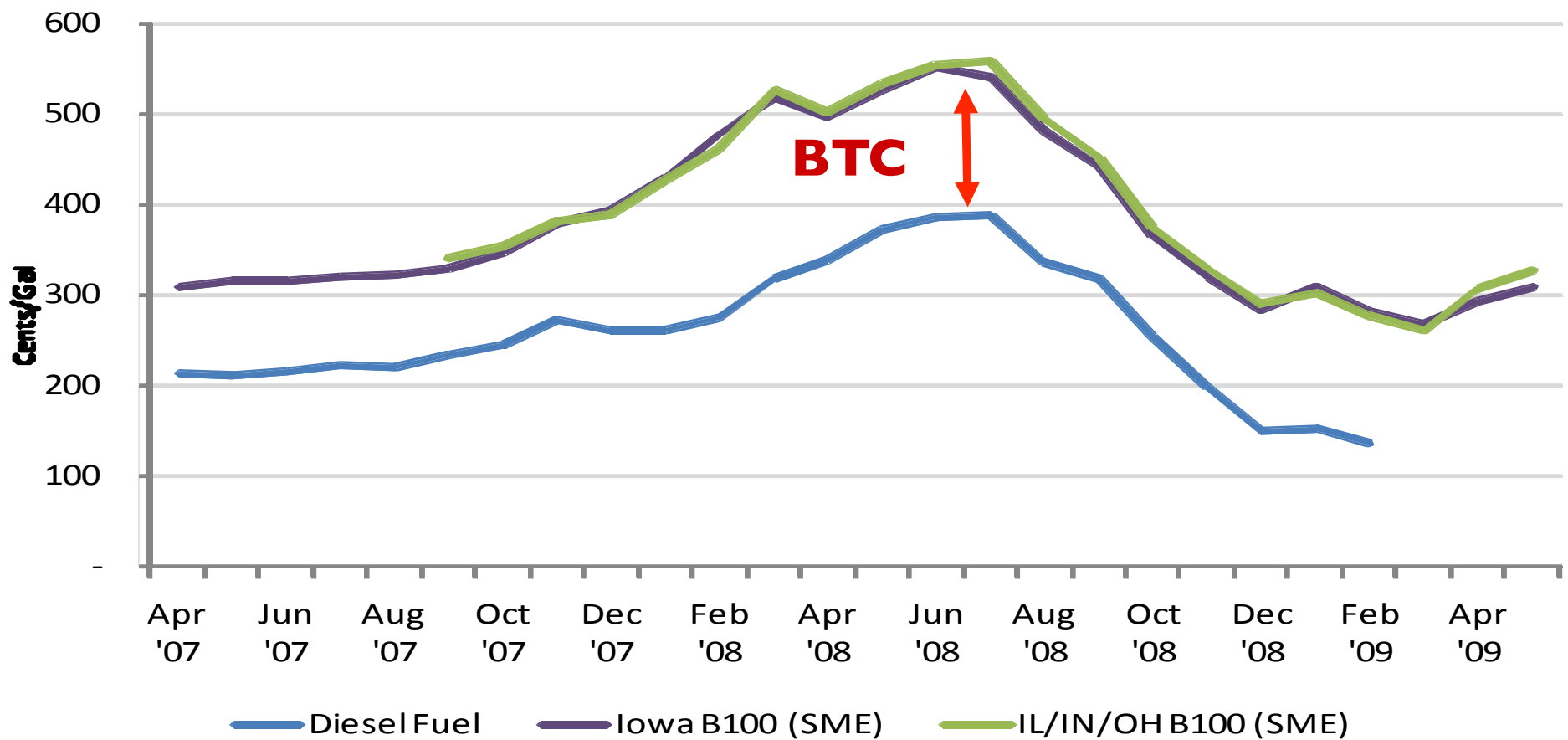
Gallons of Biodiesel



Capacity Achieved 2009



Diesel and B100 (SME) Pricing



- In general, **B20** can sell for \$0.00 – \$0.20 more per gallon than diesel
- Influenced by many factors, including commodity prices and diesel fuel prices

However,

A Feb. 22, 2010 snapshot of Minnesota's statewide B5 was CHEAPER than Iowa's regular diesel:

Fuel prices averages for 2/22/10

Regular diesel (Iowa)	\$2.539
B5 (Minnesota)	\$2.521

Virginia Biodiesel Cost Analysis 2008

Refinery A

B100 Premium High: \$1.34 more on 12/25/2008

B100 Premium Low: \$0.64 less on 3/15/2008

Refinery B

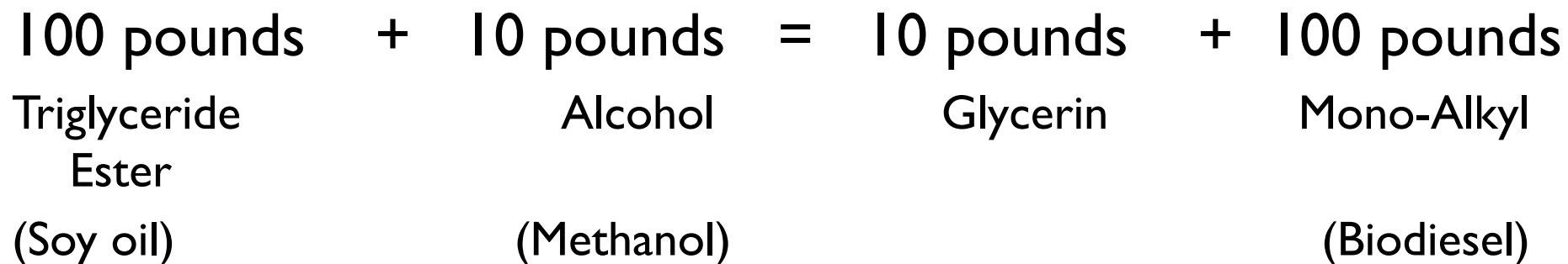
B100 Premium High: \$1.33 more on 12/11/2008

B100 Premium Low: \$0.44 less on 5/23/2008

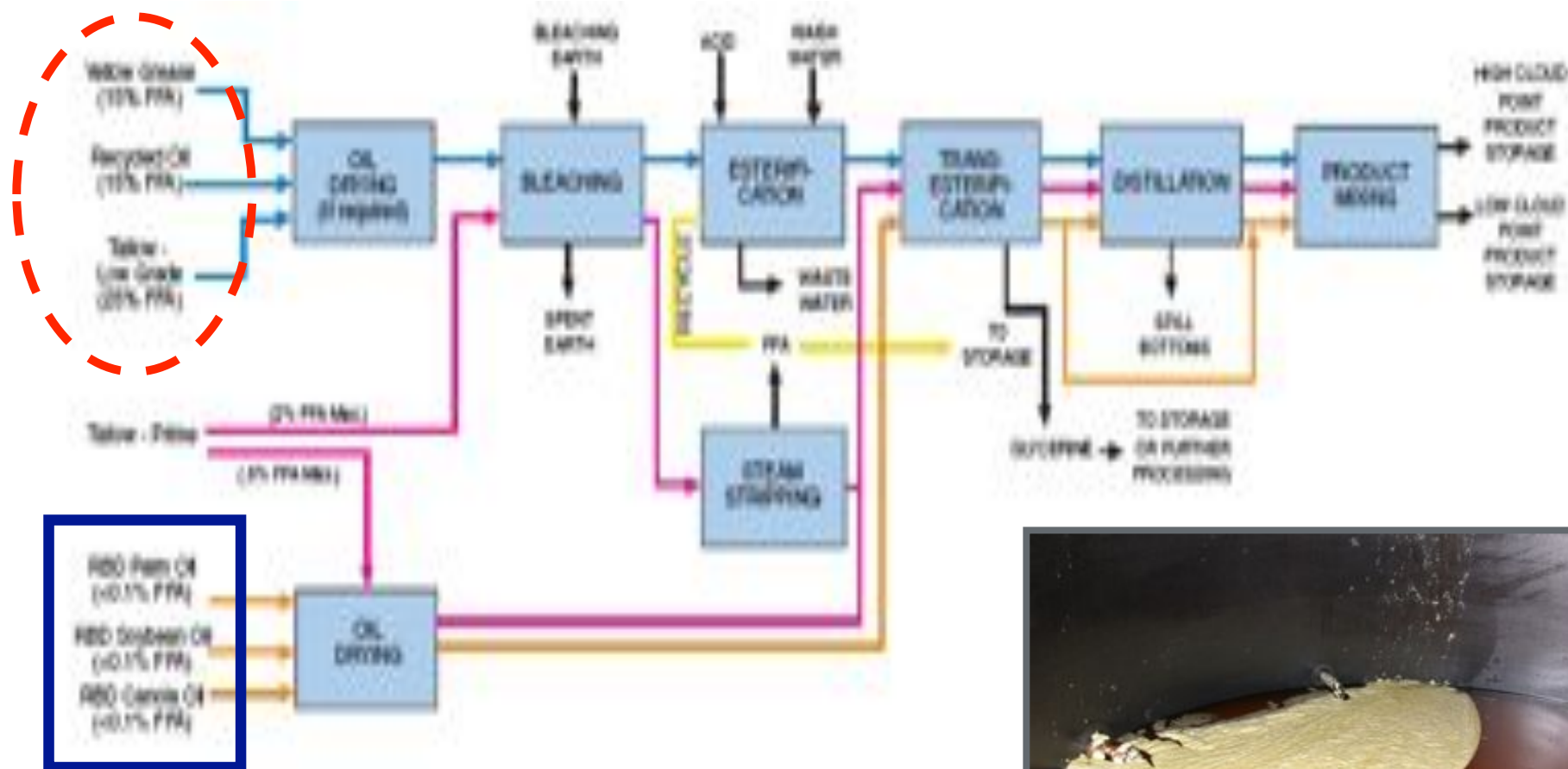
Very Basic Biodiesel Production Process



(Catalyst: potassium or sodium hydroxide)



Biodiesel Production Process – “Real World”



Feedstocks



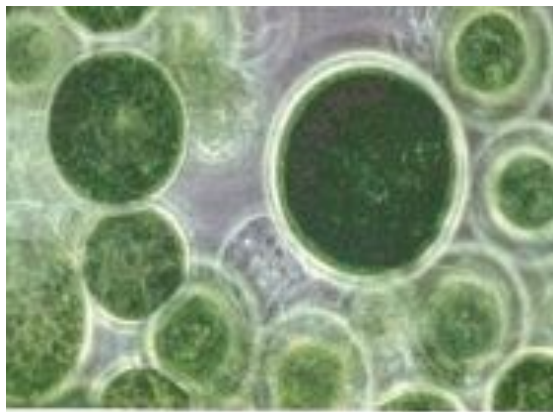
Seashore Mallow



Low Ricin Castor



Brassica Juncea



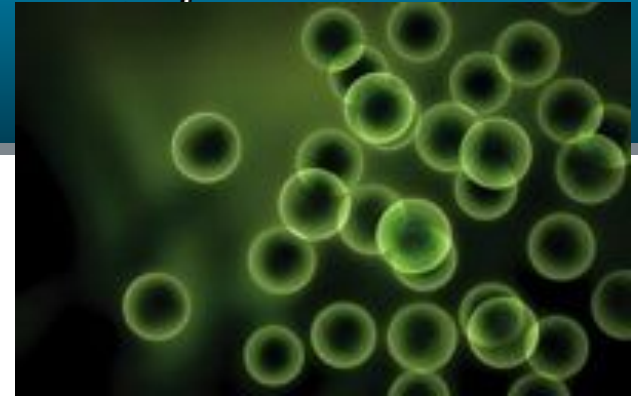
Algae



Jatropha

RFS-1 & RFS-2 Background

- Energy Policy Act (EPAAct) of 2005 enacted original Renewable Fuel Standard (RFS – 1)
 - did not contain specific renewable requirement for diesel fuel just total gallons
- Energy Investment and Security Act (EISA) of 2007 (RFS – 2)
 - created a renewable fuel program for the diesel pool of at least 1 BGY by 2012 and beyond
 - established set criteria for total life-cycle analysis



RFS-1 & RFS-2 (EISA)



RFS-1: 1 Standard; 7.5 BGY; RINs and no cut-out for biodiesel

RFS-2: Energy Independence and Security Act (December 2007) required significant changes to the RFS-1 program

- Significantly increased volumes of renewable fuel – to **36 billion gallons**
- Separation of the volume requirements into **four separate categories of renewable fuel**: cellulosic biofuel, biomass-based diesel, advanced biofuel, total renewable fuel
- Changes to the definition of renewable fuels to include **minimum lifecycle GHG reduction thresholds**
- **Restrictions on the types of feedstocks** that can be used to make renewable fuel, and the **types of land** that can be used to grow and harvest feedstocks
- Inclusion of specific types of waivers and EPA-generated credits for cellulosic biofuel

Biodiesel-derived RINs can possibly be used in the following two categories:

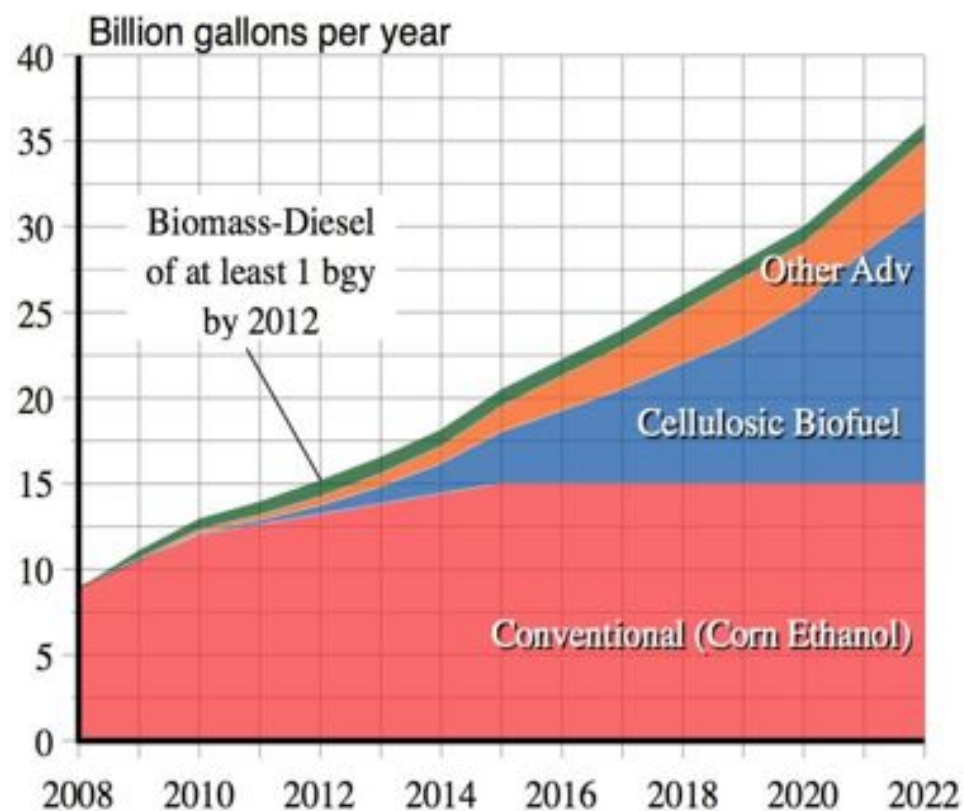
- **Biomass-Based Diesel:** 1 billion gallons by 2012 and beyond
 - Biodiesel, “renewable diesel” if fats and oils not co-processed with petroleum
 - **Must meet a 50% lifecycle GHG threshold**

- **Advanced Biofuel:** Minimum of 4 billion additional gallons by 2022
 - Essentially anything but corn starch ethanol
 - Includes cellulosic biofuels and biomass-based diesel
 - **Must meet a 50% lifecycle GHG threshold**
 - **Any biomass-based diesel will also meet the requirements for Advanced Biofuels**

- GHG emissions including indirect land use emissions, with a 30 year undiscounted time horizon.
- The EPA analysis was unique with many new features that really had not been considered before.
 - It was very complex and suffered from a lack of real hard data.
 - There were some transparency issues.

	Original Proposed Rule	Final Rule
	Kg CO ₂ eq/MM BTU	
Direct Emissions	30.3	7.8
Indirect Emissions	69.9	33.6
Total	100.2	41.4
Diesel Fuel	96.8	96.3
% Change	4	- 57

RFS-2 EISA & Sustainability Criteria



Fuel Type	Sustainability Criterion
Conventional Biofuel Ethanol from Corn Starch	20% lifecycle greenhouse gas emission reduction
Advanced Biofuels Anything but corn esthanol, including the following subcategories	50% lifecycle greenhouse gas emission reduction
Bio-based Diesel A Biomass based diesel fuel substitute	50% lifecycle greenhouse gas emission reduction
Cellulosic Biofuels Renewable fuel produced from cellulose, hemicellulose, or lignin	60% lifecycle greenhouse gas emission reduction

APPROACH GOING FORWARD FOR QUALIFYING ADDITIONAL FUELS BASED ON LIFECYCLE MODELING

Threshold determinations for certain other pathways were not possible at this time because sufficient modeling or data is not yet available. Expect results within 6 months.

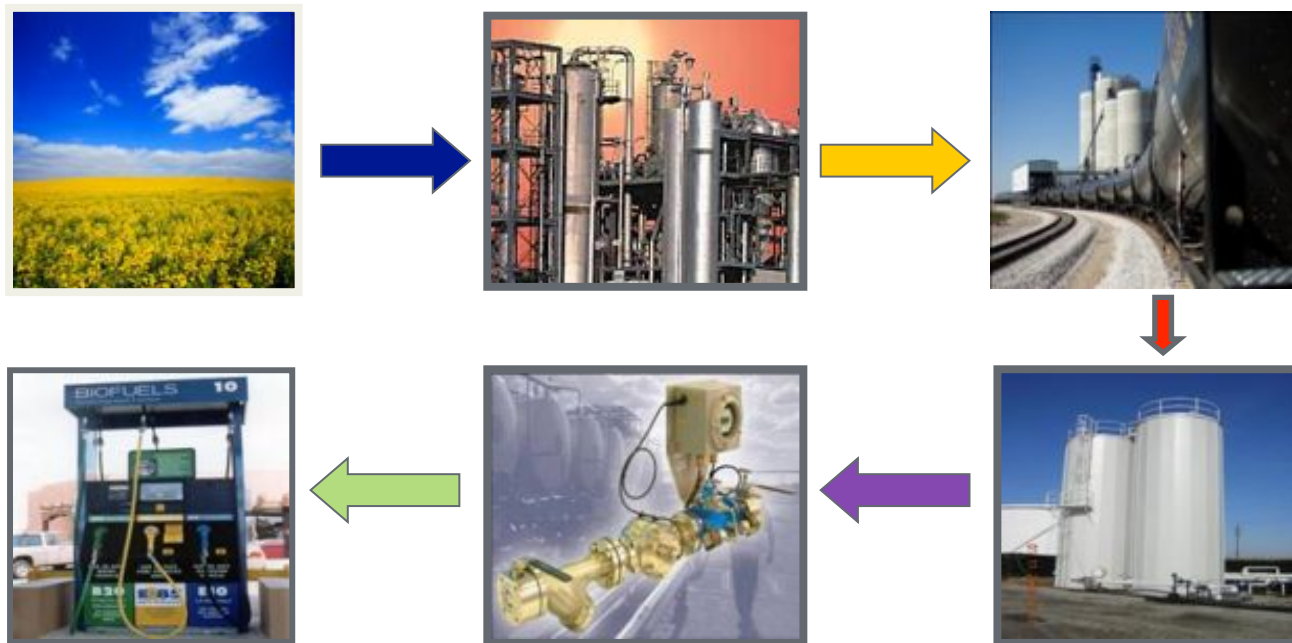
wood pulp ethanol
grain sorghum ethanol

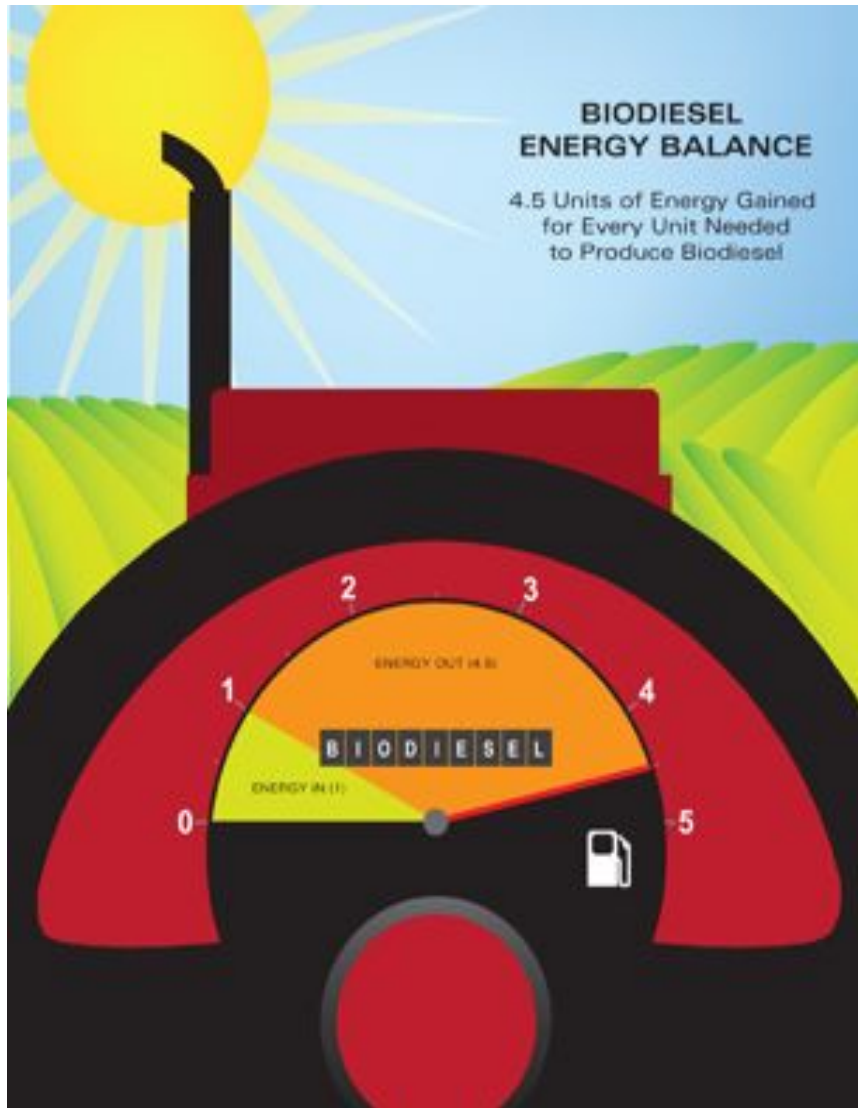
palm oil biodiesel
canola oil biodiesel

Supply Chain Management

Preserve the quality of the finished fuel

Hand-offs can cause the “biodiesel ball to be fumbled”





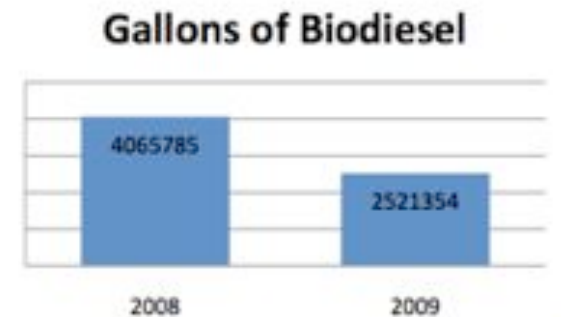
Lifecycle Analysis

Biodiesel captures and stores energy from the sun
- For every unit of energy used in its production, biodiesel returns 4.5 units of energy stored in liquid fuel.

Biodiesel reduces carbon dioxide, a greenhouse gas, by 78% over the life of the fuel's production.

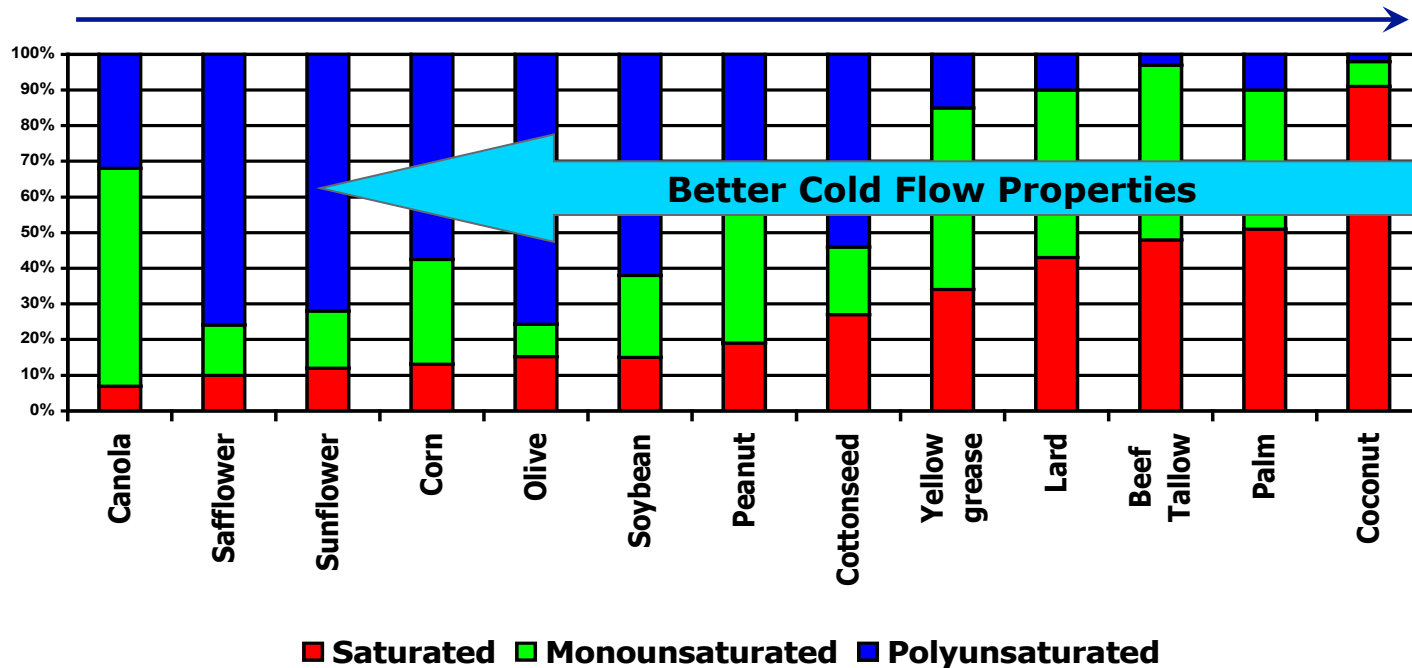
Brief Biodiesel VA History

- Past: Soy based (50%-60% 5 years ago)
 - Lots of research, 10c/lb feedstock
 - US Exports of soy biodiesel
 - Increased demand -> 75c/lb soy
 - Food versus fuel ethanol debate
- Need for cheaper feedstock led to: Poultry wastes
 - Inexpensive - 10c/lb 2 years ago
 - Quality issues in 2007 (poor cold flow properties)
- Recycled oils
 - Really inexpensive at first - free to 20c/lb
 - Collection -> Processing/treating -> Sell to Biodiesel Producers
 - Quality considerations and particle removal
- Now: Most VA biodiesel is recycled oil, soy, or canola
- Future: Algal oils



Biodiesel Feedstock Composition and Cold Weather Operability

The cold flow properties of biodiesel fuels are dependant on the feedstock (specific type of oil, fat or grease) from which they are made, and are a strong function of the level of saturated fat.



Storing Biodiesel

- What you presently do for diesel fuel, do the same for biodiesel (biocides, cold flow additives)
- Use biodiesel within 4-6 months – where you are in the country makes a difference

Pay attention to fuel contaminants. In general: air, water and fuel.



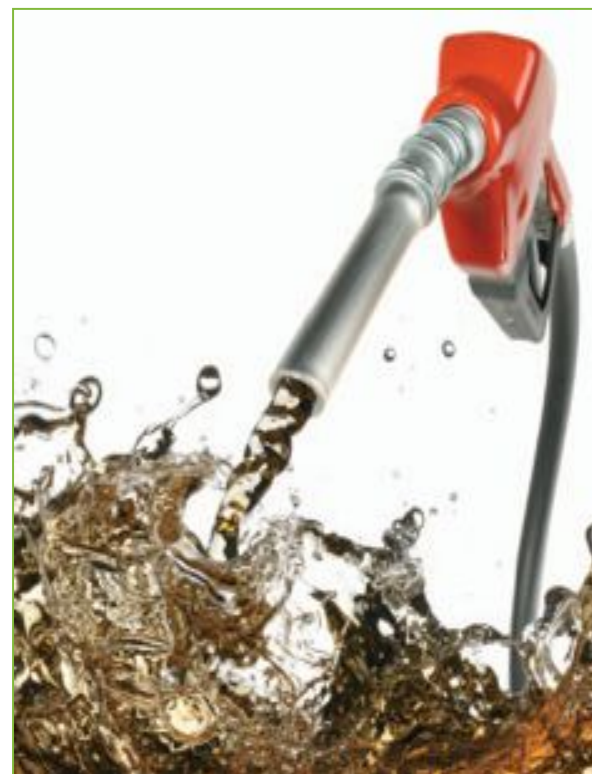
Blending Biodiesel

The impact of blending biodiesel with diesel fuel has a direct effect on performance – how the fuel is blended is critical

Splash (stop and go)

In-tank

In-line



Use in Fleets

How to get started (UL Sulfur diesel fleets):

- Pick 5-10 trucks
 - Change fuel filter
 - Clean tanks - water problems or sludge deposits now will persist with biodiesel
- Run B2 (2%) to B 5 (5%) for a month
 - Increased solubility of biodiesel will further clean tanks
 - Change filter again
- Run B10-B20
- Work with fuel blenders / VCC can help
- Good housekeeping for storage equipment



3,800 vehicles using biodiesel in VA fleets right now

Ultra Low Sulfur Diesel (ULSD) & Lubricity



- Sulfur compounds are natural lubricants in diesel.
- ULSD regulations are causing concerns with diesel engine lubricity performance.
- Wear Scar Diameter can be met with 2% biodiesel
- **Maximum WSD is 520 microns.**

**ULTRA-LOW SULFUR
HIGHWAY DIESEL FUEL**
(15 ppm Sulfur Maximum)

Required for use in all model year
2007 and later highway diesel
vehicles and engines.

Recommended for use in all diesel
vehicles and engines.

	% Biodiesel	Results (microns)
#2 ULSD	none	580
	B2	278
	B5	260
#1 ULSD	none	680
	B2	380

Biodiesel (Solvency Impact)

- Higher blends of Biodiesel (>20%) may clean sediments and accumulated tank materials
- Watch for the need to replace fuel filters throughout the supply chain when starting out
- Once sediments are cleaned from the system, filter changes will return to normal



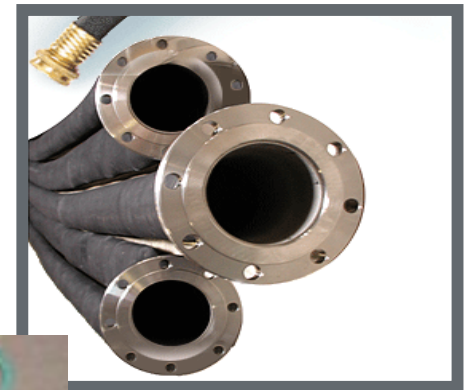
Material Compatibility

Biodiesel and biodiesel blends will form high sediment levels when in contact with brass, bronze, copper, lead, tin and zinc

Biodiesel **is compatible** with stainless steel, aluminum, fluorinated polyethylene, fluorinated polypropylene, Teflon and most fiberglass

Teflon, Viton, fluorinated plastics, and Nylon are compatible with B100

Consult with your OEM – most recent equipment is compatible



Fuel Quality & Standards



ASTM Specifications exist for:

- B5 and lower (reg diesel)
- B6 to B20
- B100 (ASTM D 6751-09)

**Performance
-based
Standards**

Performance based standard that defines the fuel as biodiesel

Industry-wide Fuel Quality Program BQ-9000
(www.bq-9000.org)

- Insures for "supply-chain management" (from feedstock through fuel use)



ASTM Specification - D6751



All physical and chemical parameters must be met every time or No Go as far as calling the “fuel” biodiesel!

BIO DIESEL

**SPECIFICATION FOR
BIO DIESEL (B100) – ASTM D6751-09**

Rev. 2009

Biodiesels defined as the mono alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, for use in compression ignition (diesel) engines. This specification is for pure (100%) biodiesel prior to use or blending with diesel fuel. #

Property	ASTM Method	Units	Units
Calcium & Magnesium, combined	EN 14114	g maximum	ppm (avg)
Flash Point (closed cup)	D 93	95 minimum	degrees F
Acidic Content (DMA or EPA following method)			
1. Methanol Content	EN 14110	0.2 maximum	% mass
2. Free Fatty	D 664	1.0 maximum	degrees C
Water & Sediment	D 1554	0.05 maximum	% vol
Viscosity (cSt @ 40 C)	D 445	1.9 – 3.2	mm ² /sec
Diluted Fuel Stability	D 674	0.02 maximum	% mass
4.14 Grade	D 4449	0.0014 max. (14)	% mass (ppm)
4.449 Grade	D 4449	0.004 max. (449)	% mass (ppm)
Copper Strip Corrosion	D 153	No. 1 maximum	
Color	D 153	1.0 minimum	
Cloud Point	D 2584	report	degrees C
Carbon Residue (10% solvent)	D 4530 ¹	0.05 maximum	% mass
Acid Number	D 664	0.40 maximum	mg KOH/g
Free Glycerol	D 4004	0.005 maximum	% mass
Total Glycerol	D 4004	0.140 maximum	% mass
Phosphorus Content	D 4051	0.001 maximum	% mass
Distillation, T90 40°C	D 1160	180 maximum	degrees C
Sodium/Potassium, combined	EN 14114	g maximum	ppm
Oxidative Stability	EN 14112	g maximum	hours
Cold Soak Filtration	Annex A D6751	990 maximum	seconds
For use in temperatures below -12 C	Annex A D6751	290 maximum	seconds

ISO1 = ISO 1000 (Cold Soak Filtration Testing) Annex A, Section 1, Table 1

The concentration of water in the 10% sample.

If a considerable amount of water is added to the 10% test, a 10% blend of biodiesel with 10% diesel fuel (B10), or higher blend (B100) can be used. Blends of over 10% biodiesel with diesel fuel should be evaluated and a cover license issued until further information is available.

Biodiesel Certificate from a distributor to the final end user

Producer is registered as a biodiesel producer with registration number 2005-000763AB.

Producer's registration has not been suspended or revoked by the Internal Revenue Service.

Producer certifies that the biodiesel to which this certificate relates is monoalkyl esters of long chain fatty acids derived from plant or animal matter that meets the requirements of the American Society of Testing and Materials D6751 and the registration requirements for fuels and fuel additives established by EPA under section 211 of the Clean Air Act (42 U.S.C. 7545).

CERTIFICATE FOR BIODIESEL

Certificate Identification Number: 1136
(To support a claim related to biodiesel or a biodiesel mixture under the Internal Revenue Code)

The undersigned biodiesel producer ("Producer") hereby certifies the following:

1. BioEnergy Of Colorado, L.L.C., 801 West 56th Ave, Denver, Co. 80216 (34-2012847)
Producer's name, address, and employer identification number

2. Bridgman Oil Company, 109 Hwy, Hutchison, KS 67501 (48-0896916)
Name, address, and employer identification number of person buying the biodiesel from Producer

3. January 8, 2007, Denver, Colorado
Date and location of sale to buyer

4. This certificate applies to 6698 gallons of biodiesel.

5. Producer certifies that the biodiesel to which this certificate relates is:
100 % Agri-biodiesel (derived solely from virgin oils)
% Biodiesel other than agri-biodiesel

This certificate applies to the following sale:
6. 1136 Invoice or delivery ticket number
6698 Total number of gallons of biodiesel sold under that invoice or delivery Ticket number (including biodiesel not covered by this certificate)

7. One Total number of certificates issued for that invoice or delivery ticket number

8. Name, address, and employer identification number of reseller to whom certificate is issued (only in the case of certificates reissued to a reseller after the return of the original certificate)

9. Original Certificate Identification Number (only in the case of certificates reissued to a reseller after return of the original certificate)

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Producer's registration has not been suspended or revoked by the Internal Revenue Service

Producer certifies that the biodiesel to which this certificate relates is monoalkyl esters of long chain fatty acids derived from plant or animal matter that meets the requirements of the American Society of Testing and Materials D6751 and the registration requirements for fuels and fuel additives established by EPA under section 211 of the Clean Air Act (42 U.S.C. 7545).

Producer understands that the fraudulent use of this certificate may subject Producer and all parties making any fraudulent use of this certificate to a fine or imprisonment, or both, together with the costs of prosecution.

Printed or typed name of person signing this certificate
Mr. Thomas A. Davanzo
Title of person signing
Managing Member
Signature and date signed [Signature] January 8, 2007

BQ-9000

Whole fuel supply chain pathway

A voluntary quality system certification program for the North American biodiesel industry

Applies internationally accepted quality management principles

Incorporates fuel specifications

Uses a series of audits to verify adherence to the company's own quality management system

www.bq-9000.com



#1 Concern of Fleet Managers, Operators, Users = Fuel Quality

Biodiesel and Engine Warranties

Performance in Cold Weather

Filter Plugging (e.g., High Blends, Bad Biodiesel)

Lubricity with ULSD



Steps to Maintaining On-Site Fuel Quality

Certificate and ASTM fuel analysis to ensure incoming fuel meets agreed upon specifications

Retain samples – Keep a quart should analytical work be required to evaluate future issues

- If either the biodiesel or generic diesel fuel fails to meet the agreed specification, notify your fuel supplier immediately

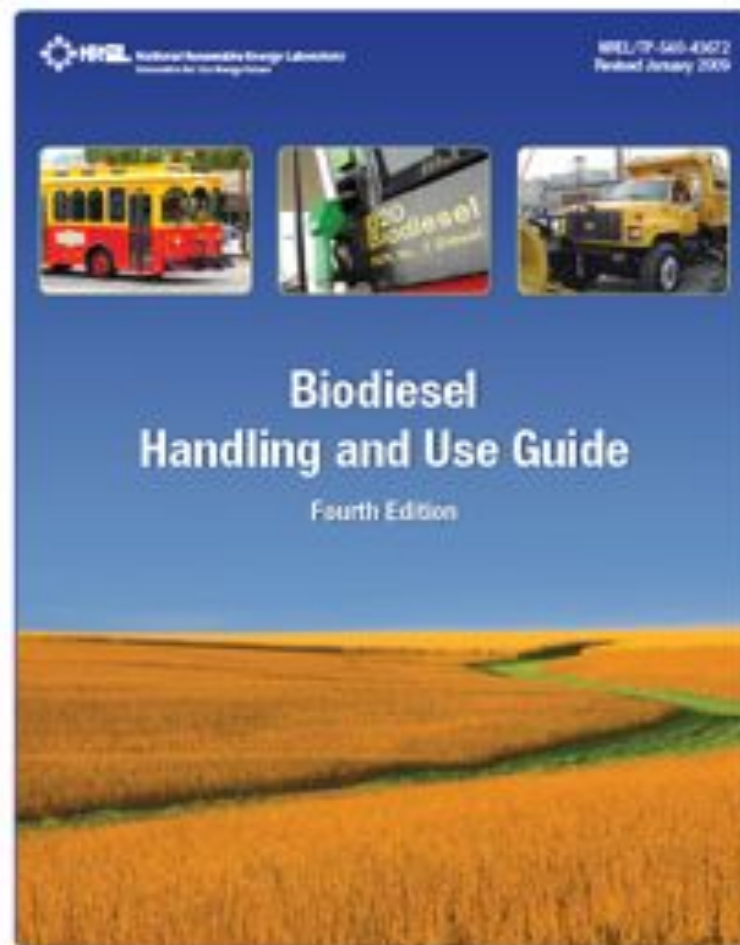


Handling

Biodiesel Handling and Use Guide

**[http://www.nrel.gov/
vehiclesandfuels/pdfs/
43672.pdf](http://www.nrel.gov/vehiclesandfuels/pdfs/43672.pdf)
(80 pages)**

Also on www.biodiesel.org



OEM Warranty Statements *Virginia Clean Cities*

- All major U.S. OEMs support at least B5 and lower blends, provided they are made with biodiesel meeting ASTM D 6751
- **Most OEMs recommending use of BQ-9000**
- More than 55% of U.S. manufacturers now support B20 or higher blends in at least some of their equipment
- Several more OEMs completing testing toward B20 support

<http://www.biodiesel.org/resources/oems>



JOHN DEERE



DODGE



B20 Approval

- Ford approves B20 in all its 2011 Ford F-Series Super Duty Trucks
- All 2011 GM Heavy Duty Products are approved for B20
- Chrysler supports the use of B20 in the Dodge Ram for government, military and commercial fleets



B100

Approval

The following companies approve biodiesel use up to B100:

- Case IH (approx. 50% of models)
- New Holland
- Fairbanks Morse
- Tomcar



Sustainable Industry Growth



- Blend economics (i.e. petroleum prices)
- Feedstock availability (i.e. supplies)
- Maintaining federal legislation
- Sound scientific approach to national and global issues
- Quality
- Consumer confidence



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Incentives and Funding Programs

Directed Towards:

- Producers
- Fleet Managers/Owners
- Purchasers



Tax Incentives

Federal

- **Alternative Fuel Infrastructure Tax Credit-** Up to 30% of the cost, not to exceed \$30,000, on equipment placed into service before Jan 1, 2009. Up to 50%, not to exceed \$50,000, on equipment placed into service on/after Jan 1, 2009. Can be used at multiple locations. \$2,000 credit available for residential equipment put into service after Dec 31, 2008. \$1,000 before. Minimum of B20.



State

- **Biodiesel Production Tax Credit-** \$0.01 per gallon of biodiesel or green diesel produced. Must produce at least 2 million gallons/year and credit can be up to \$5,000 per year. Producers only eligible in first three years of production.



Tax Incentives



- **Green Jobs Tax Credit-** Qualified employers are eligible for a \$500 tax credit per green job created that offers a salary of at least \$50,000 up to 350 jobs per employer. Good for the first five years the job is continuously filled. Expires Jan 1, 2015. *Green job is any job in the industries related to the field of renewable or alternative energies.



VA Grant Program

Virginia Biodiesel Grant Program

[Disclaimer: Contingent on the blenders tax credit passing within next 2 months!]

- Eligibility: Fleets operating 10 or more diesel vehicles in state of Virginia
- Benefits: Receive up to \$.20/gallon incremental from B5-B20; Receive up to \$.50/gallon incremental from B21-B50; Receive up to \$1.00/gallon incremental from B51-B99.
- Logistics: Reimbursement - Fleet will invoice quarterly for incremental difference between ULSD and biodiesel blend. Must provide supporting documentation.

Grants and Loans

- **Biofuels Production Grants-** A qualified producer of non-advanced neat biofuels, including neat biodiesel, green diesel, and ethanol fuel, is eligible for a grant of \$0.10 per gallon of neat biofuels sold in the commonwealth. Must produce at least 1 million gallons within the calendar year the grant is given. Eligible for up to six years.
- **Renewable Energy Systems and Energy Efficiency Improvements Grant-** Applicants who purchase renewable or efficient energy systems must provide at least 75% of cost. Grant assistance can't exceed \$750,000. Projects must occur in a rural area and R&D does not qualify.
- **Alternative Fuel Vehicle (AFV) and Fueling Infrastructure Loans-** The Virginia Board of Education may use funding from the Literary Fund to grant loans to school boards that convert school buses to operate on alternative fuels or construct alternative fueling stations.

Other Exemptions

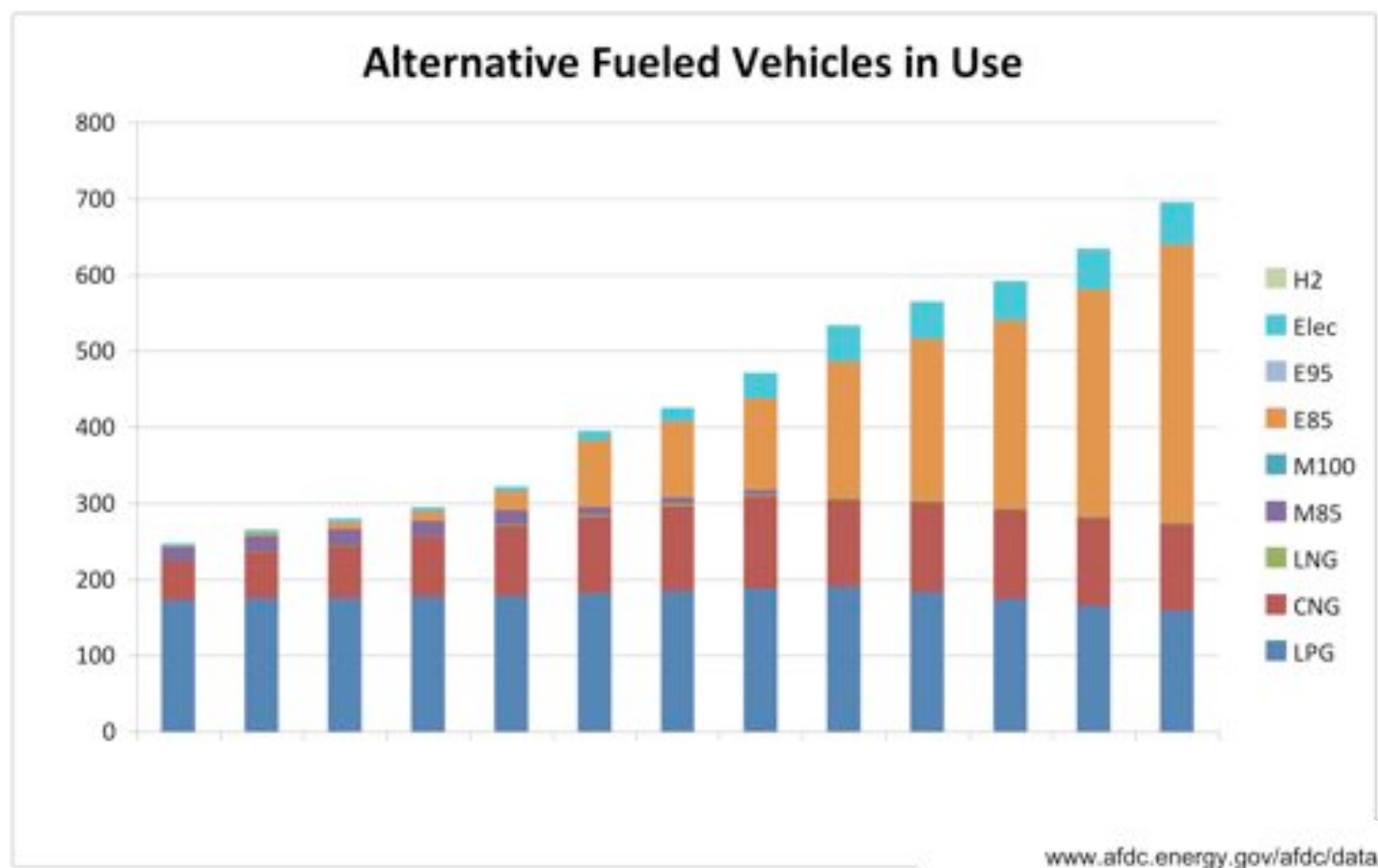
- **Registration Exemption for Biofuel Feedstock-** Beginning September 1, 2010, individuals that transport waste kitchen grease for conversion to biofuel are exempt from Virginia Department of Health registration and the associated annual application fee of \$100 per vehicle. Only applies when containers with capacity of less than 275 gallons are used and possesses no more than 1,320 gallons at one time, excluding biofuel in tanks.



Points of Contact

- U.S. Internal Revenue Service
Phone: (800) 829-1040
<http://www.irs.gov/>
- Office of Rural Development
U.S. Department of Agriculture
Phone: (202) 690-4730
<http://www.rurdev.usda.gov/>
- Virginia Code
- Check out the Alternative Fuels and Advanced Vehicles
Data Center for all Federal/State Incentives and Laws.
<http://www.afdc.energy.gov/afdc/laws/>

AFV Trends



Contact Information



Virginia Clean Cities

info@hrccc.org

www.hrccc.org

P: (540) 568-8896



Biodiesel Growth Driven By:



- Increasing World and US Energy Demand
 - Domestic Refining Capacity Shortfalls
 - Cost of War
 - China & India Consumption
 - Market Volatility
 - Environmental Concerns



"In theory there's no difference between theory and practice. In practice there is." - Yogi Berra

"If the facts don't fit the theory, change the facts." - Albert Einstein

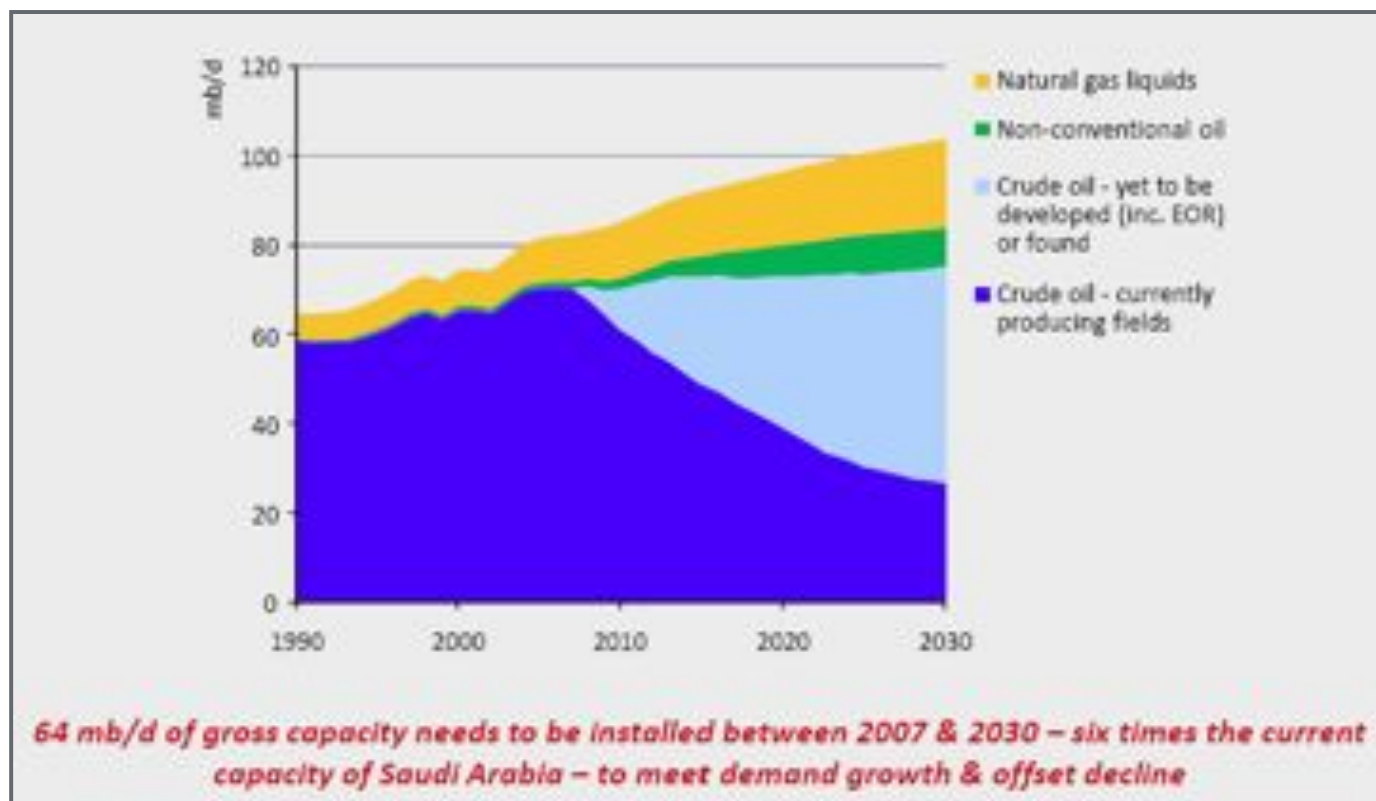
The EPA recognizes that the state of scientific knowledge of fuel LCA's continues to evolve and they are committing to further reassess the LCA determinations in the final rule.

Suggested Priority Areas



Future emissions from fossil fuels versus a 2005 petroleum baseline

- 50% of the crude oil that will be used in 2022 will come from fields that aren't in production today, what are the emissions associated with that production?



- Transparency of the modeling process
 - While EPA released a lot of information as part of the proposed rule making the inner workings of FASOM and FAPRI are not transparent.
- There are questions about how current some of the input data is and this certainly needs to be addressed.
- There is not a good understanding of exactly what idle land is available.

Biodiesel Industry working w/ CARB on these issues currently