

Slide 1 & 2

The AmBio Club has been in existence since April, 2010. Our mission is to open access to sustainable biodiesel.

- First, AmBio Club is committed to opening access and maintaining open access to sustainable biodiesel to anyone who wants to use it. We believe in the principle of Universal Access.
- Second, we believe that it is critical that all used cooking oil, both commercial and household, is collected for the exclusive use as a feedstock for sustainable biodiesel.
- Third, we believe diesel vehicle drivers need accurate information about biodiesel and the involved biodiesel vendors to feel comfortable about using biodiesel.

Needs Statement

In April, 2010, the American Lung Association published its annual air quality report, which revealed that 8 of the 10 smoggiest areas in the country were in California. In addition, the report listed San Luis Obispo County as the 9th worst air pollution area in the country. Below is a chart from the American Lung Association's website that shows that more than three million people in California are at risk for developing asthma due to air pollution. Most of this air pollution is contributed to ozone created from transportation tailpipe emissions (68).

Total Population of CA	Pediatric Asthma	Adult Asthma
36,579,326 people	877,727 children	2,283,373 adults

The American Biodiesel Buyers Club, Corp. was formed to overcome three barriers to real implementation of sustainable biodiesel which need to be overcome before it can become a common product. **The first barrier** is a lack of retail outlets and distributors near the potential buyer and potential retailers need accurate information about biodiesel to make business decisions about offering the new product. **Second**, because the consumer has no way of knowing if they are getting a good product or bad product, which can not be determined by looking at it, buyers need consumer protection information that will allow them to make informed choices. **Third**, because the product is relatively new, potential users want to know how to buy, use and store biodiesel, as well as feel comfortable that they understand the potential vehicle maintenance issues that arise from using biodiesel.

SABB BioPower Hybrid – Biodiesel and electric plug in for sale in Europe.

Slide 3

- What is biodiesel? Biodiesel is an alternative fuel to petro-diesel and can be used in any diesel engine. It is created by taking WVO and performing a chemical reaction on the oil call transesterification. (TRANS-ESTER-I-FI-CATION).
- Chemically this is the process of exchanging the organic group of an ester with the organic group of an alcohol. This improves performance and eliminates acrolein, a toxic chemical released when WVO or SVO is burned.
- Efficiency of Sustainable Biodiesel (WVO feedstock)

- 1) Sustainable biodiesel (WVO feedstock) has an even higher level of energy efficiency than the virgin oil feedstock.
- 2) A post graduate study from Murdoch University found that WVO did not have any loss of energy during production. Without having to grow and pick and crush the oil, WVO uses less petroleum and is very efficient.
- 3) In another comparison, the Soy based biodiesel was 320% more efficient than petro diesel and the WVO was 780% more efficient.
- 4) d) Another study found that sustainable biodiesel had a Net Energy Ratio (NER) of 7.85:1. In other words, 7.85 units of energy were produced to fossil fuel consumed.(Energy Balance of a Grassroots Biodiesel Production Facility By Scott Hoover, School of Engineering Science, Division of Science and Engineering, Murdoch University, 2005)

Transportation and Energy Efficiency

- Transportation accounts for 25% of world energy demands.
- Passenger transportation accounts for 60-70% of transportation energy consumption.
- The private car has poor energy performance. Only 12% of the energy used provides momentum.
- 62% of the world's oil is used in transportation each year.

Slide 4

<http://www.afdc.energy.gov/fuels/prices.html>

Clean Cities Alternative Fuel Price Report

October 2013

Table 12. Comparison of Prices by Fuel Type, Region, and Station Type

		Private Refueling Station Average Price	Public Refueling Station Average Price
<i>Biodiesel (B20) (\$/gallon)</i>	<i>National Average</i>	\$4.08	\$3.99
	New England	\$3.97	\$3.89
	Central Atlantic	\$4.03	\$4.09
	Lower Atlantic	\$3.66	\$3.87
	Midwest	\$3.93	\$3.82
	Gulf Coast	\$3.79	\$3.83
	Rocky Mountain	\$3.62	\$4.00
	West Coast	\$4.41	\$4.20
<i>Biodiesel (B99/B100) (\$/gallon)</i>	<i>National Average</i>	\$4.64	\$4.16
	New England	\$--	\$3.70
	Central Atlantic	\$--	\$4.48
	Lower Atlantic	\$--	\$4.02
	Midwest	\$--	\$3.81
	Gulf Coast	\$4.43	\$3.14
	Rocky Mountain	\$--	\$4.59
	West Coast	\$4.74	\$4.37

COMPARISON OF PRICES BY REGION FOR PUBLIC AND PRIVATE REFUELING STATIONS

Table 12, below, summarizes the comparison of fuel prices included in this report, separated into averages for privately-owned stations or stations available only to selected fleets (private refueling stations) and stations open to the public (public refueling stations). Private fleet fueling stations can typically negotiate prices lower than retail public stations, if they are willing to commit to purchasing large quantities of fuel over an extended period of time. However, private fleet pricing can sometimes be higher than retail public stations if there are unusual circumstances (remote locations, sites that use very small quantities of fuel, or special contracts where unique billing, accounting, or fleet service management fees are rolled into the price of the fuel).

As with the other prices in this report, all of these averages are prices with state and federal taxes included, using the protocols outlined at the beginning of this document.

Table 12. Comparison of Prices by Fuel Type, Region, and Station Type

		Private Refueling Station Average Price	Public Refueling Station Average Price
<i>Gasoline (\$/gallon)</i>	<i>National Average</i>	\$3.45	\$3.44
	New England	\$3.64	\$3.77
	Central Atlantic	\$3.43	\$3.41
	Lower Atlantic	\$3.21	\$3.36
	Midwest	\$3.42	\$3.31
	Gulf Coast	\$--	\$3.11
	Rocky Mountain	\$3.42	\$3.42
	West Coast	\$3.59	\$3.79
	<i>Diesel (\$/gallon)</i>	<i>National Average</i>	\$3.74
New England	\$3.95	\$4.12	
Central Atlantic	\$3.67	\$3.88	
Lower Atlantic	\$3.25	\$3.88	
Midwest	\$3.59	\$3.81	
Gulf Coast	\$4.03	\$3.76	
Rocky Mountain	\$3.84	\$3.89	
West Coast	\$3.93	\$4.13	
<i>Natural Gas (CNG) (\$/GGE)</i>	<i>National Average</i>	\$1.81	\$2.19
	New England	\$2.29	\$2.56
	Central Atlantic	\$1.97	\$2.38
	Lower Atlantic	\$1.77	\$2.10
	Midwest	\$1.97	\$1.85
	Gulf Coast	\$1.67	\$2.03
	Rocky Mountain	\$1.57	\$2.01
	West Coast	\$1.65	\$2.36
	<i>Ethanol (E85) (\$/gallon)</i>	<i>National Average</i>	\$3.15
New England		\$--	\$3.46
Central Atlantic		\$3.35	\$3.24
Lower Atlantic		\$3.33	\$3.10
Midwest		\$2.83	\$2.84
Gulf Coast		\$--	\$2.92
Rocky Mountain		\$3.32	\$3.11
West Coast		\$3.45	\$3.26



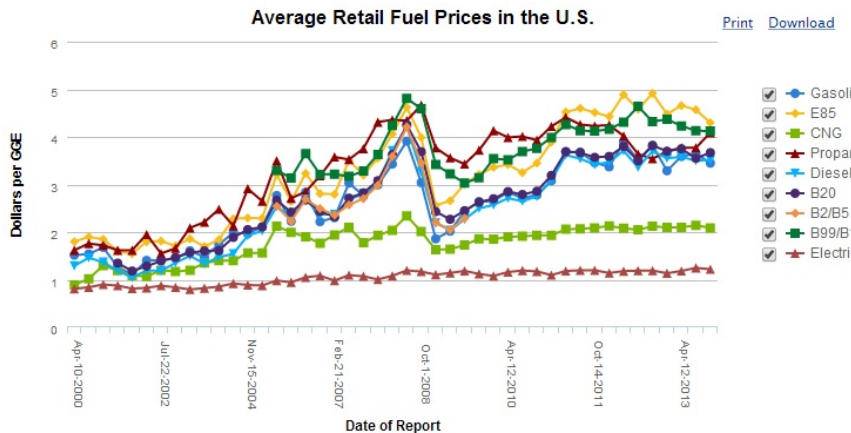
Fuel Prices

As gasoline prices increase, alternative fuels appeal more to vehicle fleet managers and consumers. Like gasoline, alternative fuel prices can fluctuate based on location, time of year, and political climate.

Alternative Fuel Price Report

The Clean Cities Alternative Fuel Price Report provides regional alternative and conventional fuel prices for biodiesel, compressed natural gas, ethanol, hydrogen, propane, gasoline, and diesel. See [all price reports](#).

- [October 2013](#)
- [July 2013](#)
- [April 2013](#)



Source: [Clean Cities Alternative Fuel Price Reports](#)

Notes: Fuel volumes are measured in gasoline-gallon equivalents (GGEs), representing a quantity of fuel with the same amount of energy contained in a gallon of gasoline. *Electric prices are reduced by a factor of 3.4 because electric motors are 3.4 times more efficient than internal combustion engines.

National Average Price Between July 12 and July 26, 2013

Fuel	Price
Biodiesel (B20)	\$4.02/gallon
Biodiesel (B99-B100)	\$4.18/gallon
Electricity	\$0.12/kWh
Ethanol (E85)	\$3.04/gallon
Natural Gas (CNG)	\$2.09/GGE
Propane	\$2.96/gallon
Gasoline	\$3.45/gallon
Diesel	\$3.91/gallon

Source: [Alternative Fuel Price Report, October 2013](#) and [U.S. Energy Information Administration](#)

Slide 5, 6 and 7

Health and Environmental Benefits of Sustainable Biodiesel:

Department of Energy:

http://www.afdc.energy.gov/fuels/biodiesel_benefits.html

National Biodiesel Board

<http://www.biodiesel.org/docs/ffs-basics/benefits-of-biodiesel.pdf?sfvrsn=4>

EPA

<http://www.epa.gov/region9/waste/biodiesel/benefits.html>

nd 77

<http://www.who.int/ipcs/emergencies/diesel.pdf>

<http://www.cancer.org/cancer/cancercauses/othercarcinogens/pollution/diesel-exhaust>

Slide 8

List of oil feedstock crops listed on Slide 9

- Algae
- Avocado (collection candidate)
- Brazil nuts
- Calendula (marigold)
- Cashew nut
- Castor beans
- Cocoa (cacao)
- Coconut
- Coffee (collection candidate)
- Coriander
- Corn (maize)
- Euphorbia (Leafy Spurge) – (Invasive)
- Hazelnuts
- Hemp
- Jstropha (invasive)
- Jojoba
- Kenaf
- Linseed (flax)
- Macadamia nuts
- Mustard seed (invasive)
- Oats
- Oil palm
- Olives
- Opium poppy
- Peanuts
- Pecan nuts
- Pumpkin seed (collection candidate)
- Rapeseed
- Safflower
- Sesame
- Soybean
- Sunflowers (collection candidate)

Slide 9:

Economic Benefits of Sustainable Biodiesel:

<http://www.nbb.org/news/nbb-press-releases/press-release-display/2013/11/13/study-biodiesel-industry-supporting-62-000-jobs>

The U.S. biodiesel industry – the largest producer of EPA-designated Advanced Biofuel in the nation – is supporting more than 62,000 jobs and \$2.6 billion in wages this year with production on pace for a record of 1.7 billion gallons, according to a study released Wednesday. NBB 11.13.13

Reduction of Foreign Oil:

NBB

http://www.biodiesel.org/reports/20131113_GEN-431.pdf

Department of Energy:

http://www1.eere.energy.gov/bioenergy/pdfs/green_jobs_factsheet2.pdf

Navy:

http://www.navy.mil/submit/display.asp?story_id=62196

Pew Trust:

<http://www.pewenvironment.org/news-room/other-resources/advanced-biofuels-help-military-reduce-dependence-on-foreign-oil-85899483564>

Slide 10/ Slide 11

- The Biodiesel Club will act in several ways to help promote universal access, with a special emphasis on promoting use of biodiesel in school buses and farm equipment. The first way we can act is by collecting donations for a universal access grant fund to give money directly to farmers and school districts to pay for the difference in price between petro-diesel and biodiesel and/or help pay for the building of storage and dispensing infrastructure.

Slide 12

- The Biodiesel Club WVO to Biodiesel Collection Event – Saturday, November 29, 2014
- Several times a year we collect household waste vegetable oil to keep it out of the sewer and to educate the public about the benefits of supporting the use of biodiesel.

Slide 13

Andy Deines

<http://invasivore.org/>

Food Network

<http://www.foodchannel.com/articles/article/emerging-trend-invasivore-movement/>

Slide 14

<http://energy.gov/articles/pumpkin-power-turning-food-waste-energy>

<http://sustainablog.org/2011/10/pumpkin-waste/>

RESOURCES ON ENERGY EFFICIENCY

Ahmed, I., Decker, J. & Morris, D. (1994). How much energy does it take to make a gallon of soydiesel? Institute for Local Self-Reliance. Minneapolis, Minnesota. Retrieved May 16, 2005 from http://www.carbohydrateconomy.org/library/admin/uploadedfiles/How_Much_Energy_Does_It_Take_To_Make_A_Gallon_.pdf.

Alovert, M. (2005). Biodiesel homebrew guide: Everything you need to know to make quality alternative diesel fuel out of waste restaurant fryer oil (10th ed.). Unpublished.

Biodiesel: A cleaner, greener fuel for the 21st century (2003). Retrieved May 16, 2005, from http://www.sustainablebusiness.com/features/feature_template.cfm?ID=915

Briggs, M. (2004). Widescale biodiesel production from algae. Retrieved May 16, 2005 from UNH Biodiesel Group: http://www.unh.edu/p2/biodiesel/article_alge.html.

Estill, L. (2004, spring/summer). Biodiesel: How “grow your own” has taken on a whole new meaning. Private Power Magazine, 1(1), 16-22.

Estill, L. (2004, March 27). Energy Balance.

Pimentel, D. (2003). Ethanol fuels: Energy balance, economics, and environmental impacts are negative [Electronic version]. Natural Resources Research, 12(2) 127-134. Retrieved May 16, 2005 from <http://acfa.org.sg/library/EthanolFuelsEnergyBalance,Economics,andEnvironmentalImpactsareNegative.pdf>

Properties of Fuels (2005). Retrieved May 25, 2005 from <http://www.methanol.org/pdfFrame.cfm?pdf=fuels.pdf>

Richards, I.R. (2000). Energy balances in the growth of oilseed rape for biodiesel and of wheat for bioethanol. Retrieved May 17, 2005 from <http://www.biodiesel.co.uk/Levington.htm>.

Sheehan, J., Camobreco, V., Duffield, J., Graboski, M., & Shapouri, H. (1998). An overview of biodiesel and petroleum diesel life cycles. National Renewable Energy Laboratory. Golden, Colorado. Retrieved May 16, 2005 from <http://www.nrel.gov/docs/legosti/fy98/24772.pdf>

Latest Study Shows Ethanol Generates More Energy Than It Takes to Produce (2005). Retrieved May 16, 2005 from http://www.greenbiz.com/news/news_third.cfm?NewsID=27864