

Release Date: October 2010
Next Release Date: November 2010

DOE/EIA0642(2009/12)

Monthly Biodiesel Production Report

December 2009

U.S. Energy Information Administration
Office of Coal, Nuclear, Electric and Alternate Fuels
U.S. Department of Energy
Washington, DC 20585

This report is available on the Web at:
<http://www.eia.gov/fuelrenewable.html>

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Preface

The Monthly Biodiesel Production Report is intended to provide insight into the operations of the U.S. biodiesel industry. The audience for this report is the U.S. Department of Energy, other governmental entities, industry trade groups, the private sector, and the general public. The U.S. Energy Information Administration (EIA) intends to provide a statistically reliable, comprehensive, and publicly accessible source of annual and monthly data. Prior to the establishment of the Monthly Biodiesel Production Report, there was no comprehensive source of statistical data to monitor the size or direction of growth in the biodiesel industry. This report is part of EIA's response to Section 1508 of the Energy Policy Act of 2005, which directs EIA to publish information on renewable fuels including biodiesel.

EIA obtains the data presented in this report from two surveys, the Monthly Biodiesel Production Survey (Form EIA-22M) and the Supplement to the Monthly Biodiesel Production Survey (Form EIA-22S). Form EIA-22M collects the following data from registered U.S. producers of biodiesel by plant:

- Plant location, operating status, and annual production capacity
- B100 and coproduct production and monthly stock changes
- Feedstock, alcohol input, and other catalysts into biodiesel production
- Sales of B100 and blended biodiesel
- End-use sales of biodiesel

Form EIA-22M is designed to provide the data necessary for EIA to carry out its responsibilities regarding renewable fuels demand in the motor fuels market, to monitor the rate of growth of the biodiesel industry, and to inform Congress whether the objectives of Section 503 of the Energy Policy Act of 1992 and Section 1508 of Energy Policy Act of 2005 are being achieved.

EIA-22M is unique in its frequency and depth. The National Biodiesel Board, for example, presents an annual production estimate. EIA has also used data from Census Report M311K Fats and Oils: Production, Consumption, and Stocks, which tracks monthly disposition of vegetable oils and animal fats. One of the uses monitored by the Census report is the input of oil and fats to methyl ester production, which is assumed to be marketed as biodiesel. EIA-22M explicitly tracks the production of biodiesel and adds data on alcohol and catalyst inputs, glycerol output, and estimated producer prices for a variety of sales types. EIA-22M enables regional and State-level reporting of biodiesel activities.

Form EIA-22S is a one-time supplement to the Monthly Biodiesel Production Survey. It collected annual observations of production capacity, biodiesel production, and coproduct production for comparison with other sources to ensure data quality. In this report, preliminary annual data are presented for 2008, and preliminary monthly data are presented for 2009.

Future Publications of the *Monthly Biodiesel Production Report*

The data presented in this report are approximately 9 months old. There are several reasons for the lag between the survey period and publication. One is that EIA-22M is a new survey. It is aimed at respondents who, for the most part, have never submitted an EIA survey prior to EIA-22M. Many respondents, therefore, needed online assistance or answers to technical questions as they worked through their survey for submission. Another reason for the delay is the timing of the survey launch. The EIA-22M survey was first opened in June 2009 for January 2009 data. Market conditions were poor for biodiesel producers in early 2009. Many firms were not actively producing or marketing biodiesel and logically assumed that a response to EIA-22M was not required. Some firms may also have laid off staff during the inactivity, and the remaining employees may have experienced difficulty collecting the information needed for the survey. Our survey staff spent considerable time following up with nonrespondents in the months after the survey was launched. The complexity of EIA-22M was also an issue for survey respondents. Though EIA worked with the National Biodiesel Board to inform respondents about the content of the survey, there are many raw materials that can be used to produce biodiesel, and there are several ways that the product can be marketed. A detailed form is needed to develop a high-resolution snapshot of market conditions in each month, and it is understandable that respondents would have questions the first few times through the survey.

EIA intends to accelerate publication of the finalized data for 2009 and preliminary data for 2010. Final data for 2009 are expected to be released in October 2010. Preliminary data for the first quarter of 2010 are expected to be released in November 2010. EIA anticipates routine publication of the monthly report approximately 75 days after the end of a calendar month.

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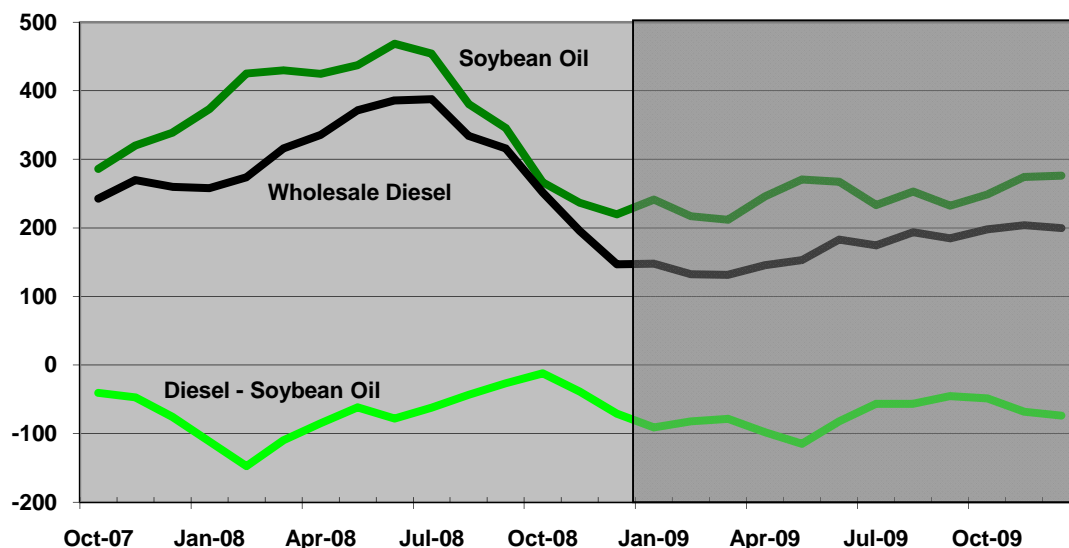
Market Summary

As of December 2009, the United States had 122 active biodiesel producers with total production capacity of 2 billion gallons per year. Between September and December 2009, 18 producers with a total of 41 million gallons of capacity exited the biodiesel market. Actual production for all of 2008 was 678 million gallons. Total production for all of 2009, however, was 506 million gallons. Capacity utilization increased from 27 percent in September 2009 to 36 percent in December 2009 (Table 1). Biodiesel typically sold at a premium to petroleum diesel during this period. The average price of blends containing 98 percent or more biodiesel and sold net of the Federal tax credit was \$1.89 per gallon for all of 2009 (Table 10). The average diesel wholesale price during this period was \$1.71 per gallon.

The largest feedstock input for 2009 was soybean oil. Soybean oil use for biodiesel production was 1.97 billion pounds (Table 3), or 33 trillion Btu, a little more than half of all feedstock used (Table 11). Beef tallow, totaling 524 million pounds for 2009, was the second-largest feedstock. White grease, a pork byproduct, was the third-largest, at 306 million pounds for 2009.

Figure ES1 shows soybean oil prices, wholesale diesel prices, and the spread between the two from October 2007 through December 2009. The darker gray area shows January 2009 through December 2009.

Figure ES-1. Soybean Oil and Diesel Prices (cents per gallon)



Sources: U.S. Energy Information Administration, *Petroleum Marketing Monthly*, March 2010, Table 4 and U.S. Department of Agriculture, *Oil Crops Outlook*, Feb 11, 2009, and Feb 12, 2010, Table 9.

Note: Diesel less soybean oil is calculated as diesel price - 0.991*soybean oil price, since 0.991 gallon of soybean oil is assumed to yield 1 gallon of biodiesel.

The spread between diesel and soybean oil prices, shown as the lowest line in Figure ES-1, is a key indicator of biodiesel producers' ability to compete with petroleum diesel fuel while still covering their costs. There are some fuel consumers who are willing to pay a price premium for biodiesel, but biodiesel can probably only achieve widespread use above mandated levels if it can be sold at the same price or a lower price per gallon than petroleum diesel fuel. If the spread between diesel and soybean oil prices is negative, a subsidy or additional revenue stream is likely to be needed to make biodiesel production profitable. For the time

period covered in this report, the combined value of the Federal Biodiesel Income Tax Credit and the Federal Biodiesel Mixture Excise Tax Credit was 100 cents per gallon, allowing for price parity between soybean oil and diesel fuel at the retail level as long as the spread between diesel and soybean oil prices was less than 100 cents per gallon. Biodiesel producers' ability to cover their other variable costs or realize a positive margin on their operations was increasingly compromised as the spread between soybean oil and diesel approached the value of the biodiesel tax credits. Glycerol, the major coproduct of biodiesel production, was once assumed to be an additional revenue stream. However, the growth in biodiesel production has glutted the market for glycerol in many places. It is not a given that a biodiesel producer can sell its glycerol; some may need to pay to dispose of it. Other potential subsidies during this time period were the Small Agri-Biodiesel Producer Tax Credit and various State tax credits for biodiesel producers. Unlike the Federal income and excise tax credits, these other subsidies were not universally applicable.

The economics of soybean-based biodiesel production improved in the fourth quarter of 2009 relative to the first 9 months of the year. Soybean oil utilization for biodiesel production was higher in October, November, and December 2009 than in any of the previous 9 months. The improved economics appear to have had a varying impact in relation to other biodiesel feedstocks. Canola oil and white grease usage increased from the third quarter to the fourth quarter of 2009, while corn oil and poultry fat usage saw a very slight uptick during the same period, remaining almost flat. However, yellow grease usage had a roughly 7 percent decrease, while tallow usage significantly declined by approximately 33 percent for the same timeframe.

Table 1. Biodiesel Production Capacity and Production, 2008 through December 2009
(Million Gallons)

Period	Annual Production Capacity	B100 Production
2008	1,759	678
2009		
January	2,153	42
February	2,144	33
March	2,090	25
April	2,091	26
May	2,146	29
June	2,143	32
July	2,091	43
August	2,087	45
September	2,086	49
October	2,057	57
November	2,002	63
December	2,045	61
Total	--	506

-- = Not applicable.

Notes: B100 is the industry designation for pure biodiesel; a biodiesel blend contains both pure biodiesel and petroleum diesel fuel.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey" and EIA-22S, "Supplement to the Monthly Biodiesel Production Survey."

Table 2. Activity at Biodiesel Plants, January through December 2009
(Million Gallons)

Period	B100 Production	Sales of B100	Sales of B100 Included in Biodiesel Blends	Beginning-of-Month Stocks of B100	End-of-Month Stocks of B100	B100 Stock Change
2009						
January	42	14	21	28	35	7
February	33	18	20	35	31	-4
March	25	12	14	32	30	-1
April	26	13	15	30	30	s
May	29	18	18	30	23	-7
June	32	18	21	23	18	-5
July	43	23	23	17	15	-2
August	45	23	18	16	19	4
September	49	28	20	19	20	s
October	57	29	24	19	24	5
November	63	31	35	24	23	-2
December	61	26	45	22	14	-8
Total	506	253	273	--	--	--

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

-- = Not applicable.

Notes: B100 is the industry designation for pure biodiesel; a biodiesel blend contains both pure biodiesel and petroleum diesel fuel. Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 3. Inputs to Biodiesel Production, January through December 2009
(Million Pounds)

Period	Feedstock Inputs							
	Vegetable Oils						Animal Fats	
	Canola Oil	Corn Oil	Cottonseed Oil	Palm Oil	Soybean Oil	Other Vegetable Oil	Poultry Fat	Tallow
2009								
January	44	W	-	W	153	W	16	71
February	15	W	-	W	146	s	15	42
March	W	W	-	W	102	1	7	35
April	W	4	-	W	102	s	8	28
May	2	8	-	W	94	W	10	47
June	2	4	-	W	111	W	10	40
July	W	10	-	W	164	W	7	54
August	W	10	-	W	168	W	13	59
September	8	12	-	W	215	W	10	43
October	65	10	-	W	240	W	10	31
November	99	11	-	W	237	W	10	42
December	85	12	-	W	241	W	11	32
Total	W	84	-	W	1,974	7	127	524

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W = Withheld to avoid disclosure of individual company data.

- = No data reported.

Note: Other Vegetable Oil includes castor, coconut, peanut, sunflower, tung, and other vegetable oils.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 3. Inputs to Biodiesel Production, January through December 2009 (Continued)
(Million Pounds)

Period	Feedstock Inputs					Other Inputs			
	Animal Fats		Recycled Feedstock		Algae	Other Feedstock	Alcohol	Catalysts	
	White Grease	Other Animal Fats ¹	Yellow Grease	Other Recycled Feedstock ²					
2009									
January	13	1	4	W	-	-	29	5	
February	10	W	4	W	-	-	25	4	
March	18	W	5	s	-	-	19	3	
April	25	1	12	W	-	-	18	3	
May	20	W	13	s	-	W	19	3	
June	28	19	11	W	-	W	22	4	
July	33	10	18	1	-	W	27	5	
August	31	7	21	2	-	W	29	5	
September	27	9	16	2	-	W	31	5	
October	36	6	20	2	-	W	34	6	
November	39	10	15	2	-	W	38	7	
December	29	15	16	2	-	W	37	6	
Total	307	82	156	13	-	W	328	56	

[1] Includes lard, etc.

[2] Includes brown grease, etc.

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- = No data reported.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 4. Biodiesel and Glycerol Production, by State, December 2009
(Million Gallons)

State	Number of Producers	Annual Production Capacity	Production	
			B100	Glycerol
Alabama	3	32	-	-
Arizona	3	18	W	W
Arkansas	3	70	W	W
California	8	71	W	W
Colorado	1	-	-	-
Connecticut	1	2	W	W
Georgia	6	39	W	W
Illinois	6	218	W	W
Indiana	5	120	W	W
Iowa	9	223	9	2
Kansas	1	2	-	-
Kentucky	4	54	W	W
Louisiana	1	12	-	-
Maryland	2	3	-	-
Michigan	2	28	-	-
Minnesota	5	110	W	W
Mississippi	3	88	W	W
Missouri	5	105	8	1
Montana	1	s	-	-
Nevada	1	1	W	W
New Mexico	1	1	-	-
New York	1	10	W	W
North Carolina	6	9	s	s
Ohio	5	61	W	W
Oklahoma	2	60	W	W
Oregon	1	1	-	-
Pennsylvania	5	57	W	W
Rhode Island	2	s	-	-
South Carolina	2	35	-	-
South Dakota	1	2	W	W
Tennessee	3	12	-	-
Texas	14	456	W	W
Virginia	3	14	s	W
Washington	1	100	W	W
West Virginia	1	3	-	-
Wisconsin	4	32	W	W
U.S. Total	122	2,045	61	6

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- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. Number of Producers is a count of entities with operable capacity in the reporting month.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 5. Biodiesel and Glycerol Production, by Census Division, December 2009
(Million Gallons)

Census Division	Number of Producers	Annual Production Capacity	Production	
			B100	Glycerol
New England	3	2	W	W
Middle Atlantic	6	67	W	W
East North Central	22	458	W	W
West North Central	21	442	23	3
South Atlantic	20	102	W	W
East South Central	13	185	W	W
West South Central	20	598	W	W
Mountain	7	20	W	W
Pacific	10	172	W	W
U.S. Total	122	2,045	61	6

W = Withheld to avoid disclosure of individual company data.

Notes: Totals may not equal sum of components due to independent rounding. Number of Producers is a count of entities with operable capacity in the reporting month.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

FIGURE 1. U.S. CENSUS REGIONS AND DIVISIONS

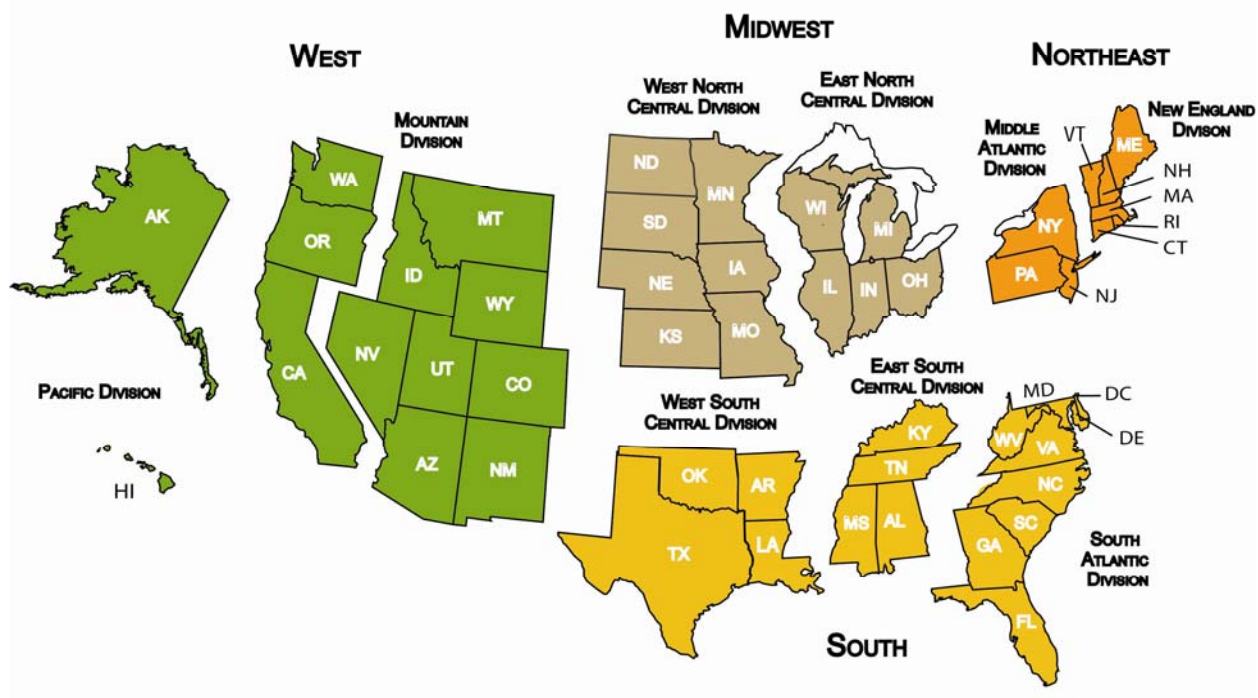


Table 6. Biodiesel and Glycerol Production, by Petroleum Administration For Defense District, December 2009
(Million Gallons)

Petroleum Administration for Defense District	Number of Producers	Annual Production Capacity	Production	
			B100	Glycerol
I	29	171	4	s
II	52	1,025	47	4
III	25	658	8	1
IV	2	s	-	-
V	14	191	2	s
U.S. Total	122	2,045	61	6

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- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. Number of Producers is a count of entities with operable capacity in the reporting month.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

FIGURE 2. PETROLEUM ADMINISTRATION FOR DEFENSE (PAD) DISTRICTS

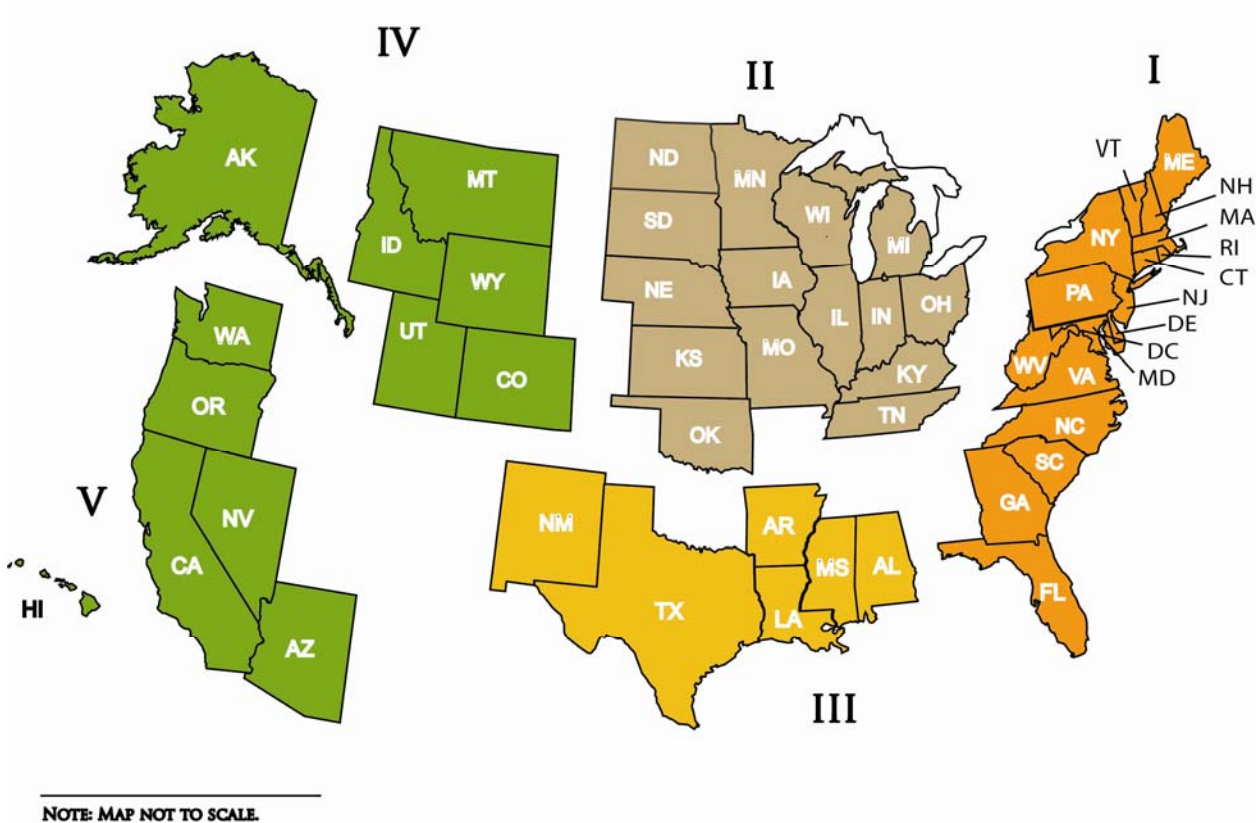


Table 7. Biodiesel Producers Sales for Resale, by Blend, January through December 2009
(Million Gallons)

Period	B100 Production	Total Sales of All Blends	Sales for Resale						
			Subtotal	Sales of B98 - B100	B100 Included in B98- B100 Sales	Diesel Included in B98- B100 Sales	Sales of Other Biodiesel Blends	B100 Included in Sales of Other Blends	Diesel Included in Sales of Other Blends
2009									
January	42	39	35	35	35	s	s	s	s
February	33	39	36	36	36	s	s	W	W
March	25	25	23	W	W	W	W	W	W
April	26	27	25	W	W	W	W	W	W
May	29	37	34	W	W	s	W	W	W
June	32	36	31	W	W	s	W	W	W
July	43	47	43	W	W	s	W	W	W
August	45	41	36	W	W	s	W	W	W
September	49	46	39	W	W	s	W	W	W
October	57	53	46	46	46	s	s	W	W
November	63	66	59	59	59	s	s	s	s
December	61	72	62	61	61	s	s	s	s
Total	506	527	468	W	W	W	W	W	W

s = Value is less than 0.5 of the table metric, but value is included in any associated total.

W = Withheld to avoid disclosure of individual company data.

Note: Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 8. Biodiesel Producer Sales, by Blend and Assignment of Tax Credit, January through December 2009
(Million Gallons)

Period	Total Sales of All Blends	Sales of B98 - B100		Sales of Other Biodiesel Blends	
		Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit	Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit
2009					
January	39	22	17	s	-
February	39	20	19	s	-
March	25	15	10	s	-
April	27	15	12	s	-
May	37	23	14	s	-
June	36	20	16	s	-
July	47	22	24	s	-
August	41	20	20	s	-
September	46	19	26	s	-
October	53	27	25	1	-
November	66	34	31	s	-
December	72	44	27	W	W
Total	527	281	242	W	W

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- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. The term "tax credit" includes Federal income and excise tax credits for biodiesel blending. It excludes the Federal small producer credit for biodiesel and any State tax incentive.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 9. Biodiesel Producer Revenue, by Blend and Assignment of Tax Credit, January through December 2009
(Million dollars)

Period	Total Revenue from Sales of All Blends	Revenue from Sales of B98-B100		Revenue from Sales of Other Biodiesel Blends	
		Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit	Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit
2009					
January	85	41	44	s	-
February	73	35	38	s	-
March	51	24	26	s	-
April	57	27	29	s	-
May	70	33	37	s	-
June	77	36	41	s	-
July	101	42	59	s	-
August	90	38	52	s	-
September	101	36	65	1	-
October	125	54	70	1	-
November	146	73	73	1	-
December	171	93	76	W	W
Total	1,148	532	609	W	W

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- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. The term "tax credit" includes Federal income and excise tax credits for biodiesel blending. It excludes the Federal small producer credit for biodiesel and any State tax incentive.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 10. Average Price Received by Biodiesel Producers, by Blend and Assignment of Tax Credit, January through December 2009
(Dollars Per Gallon)

Period	Average Price of All Blends	Average Price of B98-B100		Average Price of Other Biodiesel Blends	
		Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit	Sales for Which Producer Claimed Tax Credit	Sales for Which Producer Did Not Claim Tax Credit
2009					
January	2.19	1.83	2.67	1.75	-
February	1.88	1.76	2.01	2.20	-
March	2.01	1.68	2.49	1.01	-
April	2.10	1.86	2.43	1.18	-
May	1.87	1.44	2.55	1.14	-
June	2.13	1.81	2.55	0.94	-
July	2.18	1.88	2.46	0.92	-
August	2.20	1.84	2.57	1.00	-
September	2.21	1.85	2.48	1.88	-
October	2.38	2.03	2.74	2.21	-
November	2.23	2.11	2.35	1.98	-
December	2.38	2.12	2.81	W	W
Total	2.18	1.89	2.52	W	W

W = Withheld to avoid disclosure of individual company data.

- = No data reported.

Notes: Totals may not equal sum of components due to independent rounding. The term "tax credit" includes Federal income and excise tax credits for biodiesel blending. It excludes the Federal small producer credit for biodiesel and any State tax incentive.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey."

Table 11. Energy Balance of Biodiesel Production, 2008 through December 2009
(Trillion Btu unless otherwise noted)

Period	Feedstock	Alcohol	Losses	Glycerol	B100 Production	B100 Production (Million Gallons)	B100 Production (Thousand Barrels)
2008					87	678	16,145
2009							
January	5	s	-	-	5	42	1,011
February	4	s	-	-	4	33	780
March	3	s	-	-	3	25	599
April	3	s	-	-	3	26	624
May	3	s	-	-	4	29	689
June	4	s	-	-	4	32	761
July	6	s	-	-	6	43	1,030
August	6	s	-	-	6	45	1,070
September	6	s	-	-	6	49	1,158
October	7	s	-	-	7	57	1,364
November	8	s	-	-	8	63	1,511
December	8	s	s	1	8	61	1,455
Total	64	3	s	1	65	506	12,054

s = Value is less than 0.5 of the table metric, but value is included in any associated total.
- = No data reported.

Notes: The following equation represents the energy balance. Feedstock + Alcohol - Losses = Glycerol + B100 Production, all terms in trillion Btu. Totals may not equal sum of components due to independent rounding.

Source: U.S. Energy Information Administration, Form EIA-22M, "Monthly Biodiesel Production Survey" and EIA-22S, "Supplement to the Monthly Biodiesel Production Survey."