



## **ECONOMIC IMPACT OF ELIMINATING THE BIODIESEL TAX CREDIT**

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The current biodiesel tax credit is set to expire on December 31, 2009. Failure to extend the tax credit for biodiesel produced in the U.S. would have a substantial negative impact on biodiesel production and the consequent economic and environmental benefits made by the biodiesel industry.

The original biodiesel tax credit was passed in 2004 and has been extended twice, most recently as part of the Emergency Economic Stabilization Act of 2008 (P.L. 110-343), signed into law in October 2008. Biodiesel produced from both virgin feedstocks (such as soybean oil) and non-virgin feedstocks such as yellow grease and animal fats qualifies for the \$1.00 per gallon excise tax credit.

The biodiesel tax credit is an essential factor for profitability of producing biodiesel and maintaining the competitiveness of biodiesel with petroleum diesel as it reduces the price of biodiesel compared to petroleum diesel. As such, the tax credit increases domestic demand and provides an incentive for U.S. producers to increase investment and output.

The U.S. biodiesel industry has grown significantly over the past several years. However, the combination of volatile commodity prices and weak motor fuel demand caused by the worst recession in decades has severely impacted the biodiesel industry. The Census Bureau reports that biodiesel production for the ten months ended in October 2009 totaled 409 million gallons, nearly 30 percent below the same period in 2008. The National Biodiesel Board (NBB) estimates that biodiesel sales for 2009 will total about 475 million gallons, 31 percent below the 691 million gallons sold in 2008. The NBB reports that 173 American companies have invested in production capacity that currently approaches 2.7 billion gallons. However, as a result of



weak industry economics, capacity utilization in the biodiesel industry currently hovers around 15 percent.

The biodiesel excise tax credit is an important demand enhancement tool. The \$1.00 per gallon biodiesel excise tax credit is claimed at the time when biodiesel meeting the ASTM D6751 fuel specification and the Environmental Protection Agency's (EPA) Clean Air Act registration requirements is first blended with conventional diesel fuel. The credit can be used to offset the federal diesel fuel excise tax, and is refundable if the credit amount exceeds excise tax liability. The incentive is structured in a manner that allows the value of the credit to be reflected in the market price of the fuel. Consequently, the tax credit effectively reduces the price of neat biodiesel (B100) by \$1.00 per gallon. Looked at another way, the tax credit allows the price paid to the biodiesel producer to be \$1.00 per gallon higher than the price of petroleum diesel with little or no impact on the retail price of the blended fuel.

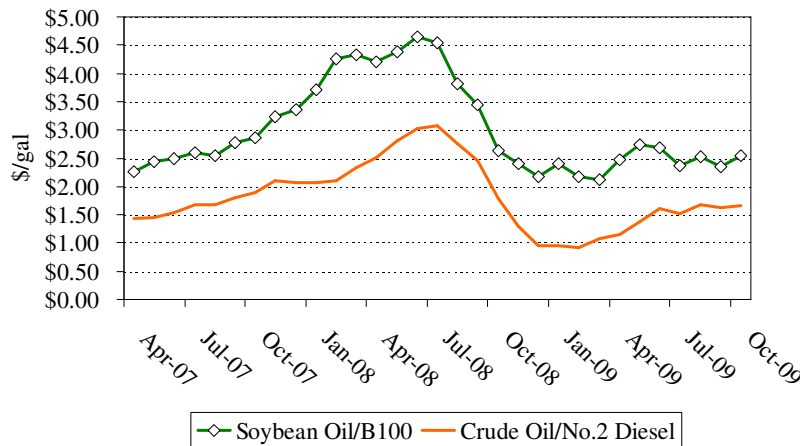
In 2008 alone, the U.S. biodiesel industry supported 51,893 jobs in all sectors of the economy. This added \$4.287 billion to the nation's Gross Domestic Product (GDP) and generated \$866.2 million in tax revenue for federal, state and local governments. Already, the decline in industry output described above has resulted in the loss of nearly 29,000 jobs throughout the entire economy in 2009. Elimination of the tax credit will essentially erase all profitability in the biodiesel industry leading to a complete decline in output, expenditures, and jobs.

### **Need for a tax incentive**

An incentive such as the biodiesel tax credit is necessary to offset the higher cost of producing biodiesel compared to petroleum diesel. Biodiesel is produced through a chemical process called transesterification where a fat or vegetable oil is separated into two products – methyl esters (e.g. biodiesel) and glycerin (a byproduct). The biodiesel production process is very efficient with methyl esters accounting for nearly 90 percent of total output. All byproducts, including

glycerin, make up the remaining 10 percent.<sup>1</sup> As such, biodiesel bears nearly the full cost of production. No. 2 diesel fuel is a joint product of the refining of crude oil and its price reflects the relative share of a barrel of crude oil. Energy Information Administration statistics on refinery yields indicate that distillate fuel oil accounts for 27 percent of the product yield of a barrel of crude oil.<sup>2</sup> The relative difference in feedstock costs between biodiesel and petroleum diesel is illustrated in Figure 1.

Figure 1  
Cost of Primary Feedstock per Gallon of Fuel



Source: EIA; USDA

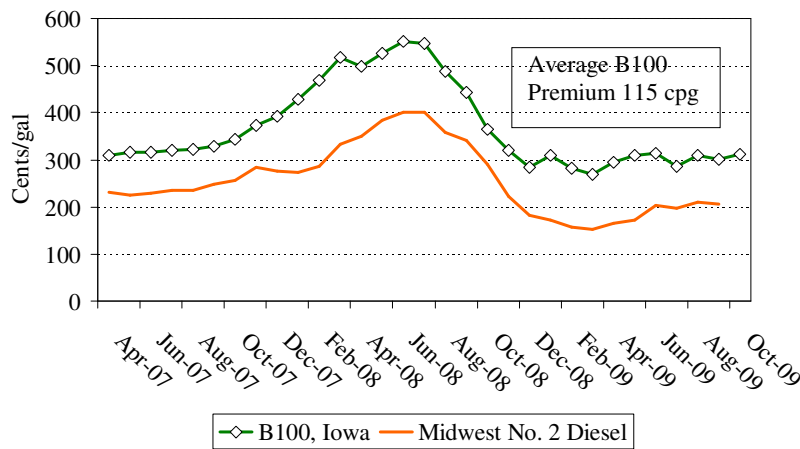
Over the past two and a half years the cost of soybean oil needed to produce a gallon of biodiesel averaged \$3.01 per gallon while the equivalent cost of crude oil to produce a gallon of distillate fuel was \$1.82 per gallon, a difference of \$1.20 per gallon.

<sup>1</sup> According to the Census Bureau (Current Industrial Report M311K) soybean oil was the primary feedstock for about 44 percent of biodiesel produced during the ten months ending in October 2009. The economic model used by Iowa State University to estimate biodiesel costs and returns assumes that it takes 7.55 pounds of soybean oil to produce one gallon of biodiesel and 0.9 pounds of glycerin. Feedstocks (soybean oil) account for 87 percent of the variable cost of producing biodiesel.

<sup>2</sup> EIA Refinery Yield. [http://tonto.eia.doe.gov/dnav/pet/pet\\_pnp\\_pct\\_dc\\_nus\\_pct\\_m.htm](http://tonto.eia.doe.gov/dnav/pet/pet_pnp_pct_dc_nus_pct_m.htm).

Since its inception the tax credit has become imbedded into the price of biodiesel and helps determine the profitability of producing biodiesel. This is illustrated in Figure 2 which compares the price of B100, FOB Iowa plant (reported by USDA) to the average retail price of No. 2 low sulfur diesel fuel in Midwest markets (PADD2, reported by EIA).

Figure 2  
Iowa Biodiesel and Midwest No. 2 Low Sulfur Diesel Prices



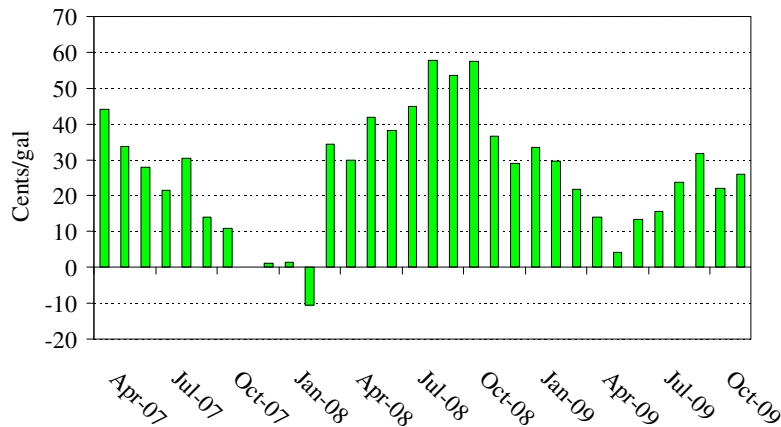
Source: EIA, USDA/AMS

Between April 2007 and September 2009 (the last date for which Midwest diesel prices are available) the average premium for biodiesel was \$1.15 per gallon, slightly more than the tax credit.

Economic theory tells us that at least in the short term producers will stay in business as long as they cover their variable costs of production. As indicated earlier, the soybean oil feedstock accounts for 87 percent of variable production costs for a biodiesel producer. Revenue is provided by the value of biodiesel and byproduct glycerin sold represented by their price per gallon. Over the April 2007 through October 2009 period the price of B100 (FOB plant, Iowa) averaged \$3.69 while glycerin added 3 cents per gallon to total revenue. As shown in Figure 2,

Iowa State University economists estimate that a typical 30 million gallon per year biodiesel plant using soybean oil as the feedstock provided an average return over variable costs of 26 cents per gallon between April 2007 and October 2009. The data for this calculation is shown in Appendix 1.

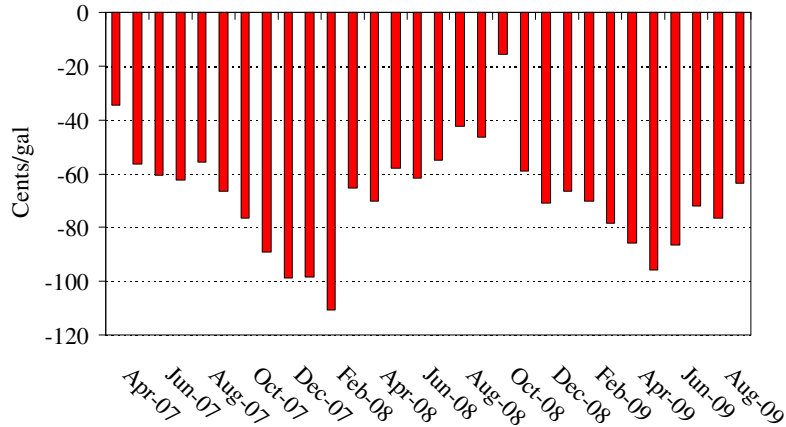
Figure 3  
B100, Returns over Variable Costs



Source: Iowa State University Ag Marketing Resource Center, Biodiesel Profitability. Updated 11/30/2009

In the absence of the tax incentive, marketers of diesel fuel are likely to be unwilling to pay much more than the prevailing price of petroleum diesel. Using the maximum of the average Midwest (PADD2) retail price for No. 2 distillate fuel or the FOB price of B100 less the \$1.00 per gallon tax credit as the base for revenue calculation, total revenue for the 30 MGY biodiesel plant over the same period would average \$2.79 per gallon. When compared to the average variable cost of production elimination of the tax credit would result in a negative return (or loss) of \$0.683 per gallon. The impact of eliminating the biodiesel tax credit on returns over variable costs is shown in Figure 4. The data for this calculation is shown in Appendix 2.

Figure 4  
B100 Returns over Variable Costs  
Without Tax Credit



Source: Iowa State University Ag Marketing Resource Center, Biodiesel Profitability. EIA

**Conclusion**

Without the tax credit the price of biodiesel would be insufficient to provide a positive return over variable costs and the biodiesel industry could be expected to collapse. This would have several notable adverse economic impacts including:

- a loss of jobs and income
- increased demand for petroleum diesel and a degradation of energy security
- lower demand for soybean oil and soybeans for crushing leading to lower soybean prices and a negative impact on farm income
- stranded investment as biodiesel capacity is idled
- lost tax revenue for States and local governments



As shown in Table 1 the biodiesel industry will spend about \$1.3 billion on raw materials, goods and services to produce 475 million gallons of biodiesel this year. In doing so the biodiesel industry will add \$4.1 billion to GDP this year, increase household income by nearly \$1 billion, and support nearly 23,000 jobs in all sectors of the economy. In addition the biodiesel industry will provide \$445 million of tax revenue to the Federal treasury and \$383 million to state and local governments.

Table 1  
Economic Contribution of the U.S. Biodiesel Industry

Industry	Spending (Mil 2009 \$)	Impact		
		GDP	Earnings	Employment
		(Mil 2009 \$)	(Mil 2009 \$)	(Jobs)
Annual Operations				
Feedstocks (soybean oil and other fats)	\$1,106.2	\$2,306.8	\$818.0	19,686
Industrial chemicals	\$129.8	\$234.5	\$93.1	1,743
Electric, natural gas, water	\$35.6	\$52.8	\$22.8	410
Maintenance and repair	\$14.3	\$20.5	\$13.6	342
Business Services	\$25.9	\$39.8	\$26.2	541
Transportation	\$2.1	\$3.5	\$1.8	42
Earnings paid to households	\$14.4	\$13.1	\$6.8	172
Subtotal	\$1,328.3	\$2,670.9	\$982.3	22,935
Plus Value of biodiesel output				
Biodiesel		\$1,434.5	\$14.4	
Co-products (glycerin)		\$12.8		
<b>Total Impact</b>		<b>\$4,118.3</b>	<b>\$996.7</b>	<b>22,935</b>

Failure to extend the biodiesel tax credit puts all of these economic impacts at risk. It is difficult to precisely estimate the number of biodiesel plants that would close and capacity that would be idled in the absence of the tax credit. However, using the experience of the current recession as a guide it is not unreasonable to expect that under conditions of negative profitability caused by elimination of the tax credit, industry output could cease altogether resulting in the loss of an additional 23,000 jobs in the entire economy.

APPENDIX 1

Costs and Returns for Biodiesel with Tax Credit

	<b>Variable Cost of Production (Cts/gal)</b>	<b>B100 Price FOB Plant Iowa (Cts/gal)</b>	<b>Glycerin Price FOB Plant Iowa (Cts/gal)</b>	<b>Total Revenue (Cts/gal)</b>	<b>Return Over Variable Cost (Cts/gal)</b>
Apr-07	267.75	309.17	2.70	311.87	44.12
May-07	284.80	315.75	2.70	318.45	33.65
Jun-07	291.20	316.50	2.70	319.20	28.00
Jul-07	300.87	319.75	2.70	322.45	21.58
Aug-07	294.22	322.00	2.70	324.70	30.48
Sep-07	317.84	329.13	2.70	331.83	13.99
Oct-07	335.80	344.13	2.70	346.83	11.02
Nov-07	376.96	374.20	2.70	376.90	-0.06
Dec-07	393.59	392.13	2.70	394.83	1.24
Jan-08	428.94	427.75	2.70	430.45	1.51
Feb-08	481.11	467.75	2.70	470.45	-10.66
Mar-08	484.61	516.38	2.70	519.08	34.46
Apr-08	470.62	497.88	2.70	500.58	29.95
May-08	486.44	525.60	2.70	528.30	41.86
Jun-08	515.50	551.00	2.70	553.70	38.20
Jul-08	504.39	546.75	2.70	549.45	45.06
Aug-08	432.64	487.70	2.70	490.40	57.76
Sep-08	392.39	443.25	2.70	445.95	53.56
Oct-08	309.62	364.50	2.70	367.20	57.58
Nov-08	285.37	319.13	2.70	321.83	36.46
Dec-08	257.99	284.25	2.70	286.95	28.96
Jan-09	277.99	308.80	2.70	311.50	33.51
Feb-09	255.41	282.38	2.70	285.08	29.66
Mar-09	249.27	268.25	2.70	270.95	21.68
Apr-09	282.54	293.88	2.70	296.58	14.04
May-09	308.49	310.00	2.70	312.70	4.21
Jun-09	302.57	313.38	2.70	316.08	13.50
Jul-09	272.74	285.80	2.70	288.50	15.76
Aug-09	289.59	310.50	2.70	313.20	23.61
Sep-09	272.30	301.50	2.70	304.20	31.90
Oct-09	293.95	312.00	2.70	314.70	20.75
Nov-09	314.00	337.00	2.70	340.00	26.00
Average	344.73	368.07	2.70	370.78	26.04

Source: Iowa State Univ. Ag Marketing Resource Center

APPENDIX 2

Costs and Returns for Biodiesel Without Tax Credit

	<b>Variable Cost of Production (Cts/gal)</b>	<b>N0.2 Distillate MW Retail (Cts/gal)</b>	<b>B100 Price FOB Plant less Credit (Cts/gal)</b>	<b>Glycerin Price FOB Plant Iowa (Cts/gal)</b>	<b>Total Revenue Without Credit (Cts/gal)</b>	<b>Return Over Variable Cost (Cts/gal)</b>
Apr-07	267.75	230.50	209.17	2.70	233.20	-34.55
May-07	284.80	225.50	215.75	2.70	228.20	-56.60
Jun-07	291.20	228.10	216.50	2.70	230.80	-60.40
Jul-07	300.87	235.70	219.75	2.70	238.40	-62.47
Aug-07	294.22	235.90	222.00	2.70	238.60	-55.62
Sep-07	317.84	248.70	229.13	2.70	251.40	-66.44
Oct-07	335.80	256.50	244.13	2.70	259.20	-76.60
Nov-07	376.96	285.00	274.20	2.70	287.70	-89.26
Dec-07	393.59	275.30	292.13	2.70	294.83	-98.76
Jan-08	428.94	273.70	327.75	2.70	330.45	-98.49
Feb-08	481.11	287.10	367.75	2.70	370.45	-110.66
Mar-08	484.61	332.80	416.38	2.70	419.08	-65.54
Apr-08	470.62	350.40	397.88	2.70	400.58	-70.05
May-08	486.44	384.40	425.60	2.70	428.30	-58.14
Jun-08	515.50	400.70	451.00	2.70	453.70	-61.80
Jul-08	504.39	401.60	446.75	2.70	449.45	-54.94
Aug-08	432.64	359.30	387.70	2.70	390.40	-42.24
Sep-08	392.39	340.60	343.25	2.70	345.95	-46.44
Oct-08	309.62	291.20	264.50	2.70	293.90	-15.72
Nov-08	285.37	223.50	219.13	2.70	226.20	-59.17
Dec-08	257.99	182.90	184.25	2.70	186.95	-71.04
Jan-09	277.99	170.90	208.80	2.70	211.50	-66.49
Feb-09	255.41	157.70	182.38	2.70	185.08	-70.34
Mar-09	249.27	152.40	168.25	2.70	170.95	-78.32
Apr-09	282.54	165.70	193.88	2.70	196.58	-85.96
May-09	308.49	170.90	210.00	2.70	212.70	-95.79
Jun-09	302.57	203.10	213.38	2.70	216.08	-86.50
Jul-09	272.74	197.90	185.80	2.70	200.60	-72.14
Aug-09	289.59	210.50	210.50	2.70	213.20	-76.39
Sep-09	272.30	206.20	201.50	2.70	208.90	-63.40
Average	347.45	256.16	270.97	2.70	279.11	-68.34

Source: Iowa State Univ. Ag Marketing Resource Center