MINNESOTA DEPARTMENT OF AGRICULTURE

Report to the Legislature

Annual Report on Biodiesel

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Executive Summary

In 2005, Minnesota became the first state to implement legislation mandating the use of biodiesel by blending biodiesel into its fuel supply at a level of 2 percent—commonly referred to as B2. According to subsequent legislation (Minnesota Statutes §239.77, subd. 2), **all diesel sold or offered for sale in Minnesota must contain 5 percent biodiesel (B5) as of May 2009, increasing to 10 percent (B10) in 2012 and 20 percent (B20) in 2015**.[1],[2]

The Biodiesel Task Force was formed in 2003—comprised of appointees from industry, academia, and various associations—**to advise the Commissioner of Agriculture on implementing the state's biodiesel blend requirement and building the state's biodiesel production capacity.** Since then, the Task Force has helped promote the industry and educate biodiesel developers, marketers, consumers and manufacturers about biodiesel and related issues in Minnesota.

Experience and testing demonstrate that biodiesel blends can perform well in cold weather. During the first winter following implementation of B5 in May 2009, some diesel fuel users in Minnesota reported problems potentially associated with the use of higher blends of biodiesel. In January 2010 the Minnesota Department of Commerce issued a temporary waiver for the B5 requirement in #1 diesel in response to concerns about the potential for clogged filters in extreme cold weather. In spite of sub-zero temperatures this winter, though, no issues with the state's B5 mandate had been reported for the winter of 2010-11 at the time of this report.

Significant progress has been made in providing new industry specifications that establish and improve quality guidelines for biodiesel, biodiesel blends, and diesel fuel oil. The American Society for Testing and Materials (ASTM) introduced additions to existing standards that incorporated biodiesel blends up to B5 into the diesel fuel standard (D975), added a cold soak filtration test for B100 to the biodiesel specification (D6751), and established a new specification (D7467) for blends of biodiesel from B6 through B20. Discussions related to additional specification parameters are ongoing.

The price of biodiesel fuel has been volatile along with diesel fuel prices.[3] **However, the price difference to consumers for biodiesel blends has been moderate:** for example, a gallon of B5 has averaged just 4 cents more than a gallon of diesel since implementation in May 2009. The federal biodiesel blender's tax credit of $1.00 per gallon expired temporarily at the end of 2009, leading to significant changes in both biodiesel and diesel fuel markets. The tax credit was retroactively reinstated in December for both 2010 and extended into 2011, which should allow the price margin between diesel

[1] By law, the 10 and 20 percent minimum content levels would be effective from April 1st through October 31st only. According to MS §239.77, subd. 2a, "The minimum content for the remainder of the year is five percent. However, if the commissioners of agriculture, commerce, and pollution control determine, after consultation with the biodiesel task force and other technical experts, that an American Society for Testing and Materials (ASTM) specification or equivalent federal standard exists for the specified biodiesel blend level in those clauses that adequately addresses technical issues associated with Minnesota's cold weather and publish a notice in the State Register to that effect, the commissioners may allow the specified biodiesel blend level in those clauses to be effective year-round."

[2] According to MS §239.77, subd. 2b, the 10 and 20 percent minimum content levels "become effective on the date specified only if the commissioners of agriculture, commerce, and pollution control publish notice in the State Register and provide written notice to the chairs of the House of Representatives and Senate committees with jurisdiction over agriculture, commerce, and transportation policy and finance, at least 270 days prior to the date of each scheduled increase, that certain conditions have been met (e.g., ASTM specifications exists, adequate supply is available, etc.) and the state is prepared to move to the next scheduled minimum content level."

[3] For 2006-2009, the price of biodiesel is the rack (wholesale) price after the $1.00 federal tax credit. For 2010, prices reflect wholesale prices without the tax credit, which was reinstated in December 2010.

and B5 to shrink to 1.5 cents. However, because credit was only extended for one year, the industry may still operate under some uncertainty.

The value of a Renewable Identification Number (RIN) for a gallon of biodiesel, a feature of the EPA's Renewable Fuels Standard program, **has been equal to or greater than the federal biodiesel tax credit**. As this mechanism settles into the marketplace, it could take the place of the federal tax credit and reduce the cost of biodiesel blends to the consumer.

The supply of biodiesel fuel to Minnesota terminals has generally been constant. Few if any B5 outages occurred at terminals because biodiesel fuel was not available; instead, common reasons for B5 outages include local diesel fuel outages and a lack of winter blending equipment at certain out-of-state terminals. Plans for the installation of major new winter blending equipment at a terminal in Sioux Falls, South Dakota is scheduled for 2011 and is expected to alleviate issues related to winter blending in southwestern Minnesota.

Minnesota's B2 and B5 mandates have provided an important incentive leading to the establishment of the state's biodiesel production capacity of 65 million gallons. **The state's existing capacity can provide all the biodiesel necessary for B5, approximately 80 percent of the product needed for B10, and about 40 percent required for future statewide B20 requirements**. A new biodiesel plant in Minnesota will likely provide additional capacity over the next few years. However, with the high cost of feedstock oils and the temporary expiration of the biodiesel tax credit, some Minnesota plants have temporarily stopped or reduced production.

Feedstocks for biodiesel production at Minnesota plants are generally determined by the price and availability of the oil or fat used in the process. Given the large soybean oil crushing capacity in Minnesota, **much of the soy oil used in Minnesota biodiesel plants is likely to be sourced from Minnesota oil producers. However, soybean oil prices have been at record high levels recently, which has reduced** profitability and production**.**

Introduction

This report is submitted pursuant to Minnesota Statutes §239.77, subd. 5:

> *Beginning in 2009, the commissioner of agriculture must report by January 15 of each year to the chairs and ranking minority members of the legislative committees and divisions with jurisdiction over agriculture policy and finance regarding the implementation of the minimum content requirements in subdivision 2, including information about the price and supply of biodiesel fuel. The report shall include information about the impacts of the biodiesel mandate on the development of biodiesel production capacity in the state, and on the use of feedstock grown or raised in the state for biodiesel production. The report must include any written comments received from members of the biodiesel fuel task force by January 1 of that year designated by them for inclusion in the report.*

Background

The Biodiesel Task Force was created by the Legislature in March 2003 to help the state carry out its biodiesel mandate. Since then, the Task Force has met on an ad-hoc basis to discuss issues related to biodiesel production and use. Sub-teams have been formed to address more specific issues such as cold weather operability.

The Biodiesel Task Force members are appointed by the Commissioner of Agriculture. Current membership includes:

- Douglas Peterson, Minnesota Farmers Union
- Dustin Haaland, CHS Inc.
- Robert Krogman, Minnesota Petroleum Marketers Association
- Kelly Marczak, American Lung Association of Minnesota
- Thomas Byrne, Byrne & Company, Ltd.
- Charles Neece, FUMPA
- Kristin Weeks-Duncanson, At large
- Kevin Paap, Minnesota Farm Bureau
- Ronald Marr, Minnesota Soybean Processors
- Kelly Strebig, University of Minnesota Center for Diesel Research
- Dave Slade, Soy Mor
- Ron Osman, Flint Hills Resources, LP
- John Hausladen, Minnesota Trucking Association
- Lance Peterson, Minnesota Soybean Growers Association
- Bruce Heine, Magellan Midstream Partners, LP

Biodiesel Task Force's Technical Cold Weather Issues Team

The Biodiesel Task Force's Technical Cold Weather Issues Team was established pursuant to Laws of Minnesota for 2008 Ch. 297, Art. 1, Sec. 68. The Team decided that cold weather issues and concerns should be addressed by three subcommittees comprised of technical experts in the specific areas of: 1) production/blending, 2) distribution and 3) handling of biodiesel, biodiesel blends and diesel fuel. The 2009 legislative report, "Petroleum Diesel Fuel and Biodiesel Technical Cold Weather Issues," includes results of subcommittee activities on fuel sampling and analysis, product availability and recommendations on best practices.[4] In the spring of 2009 the Handling Subcommittee issued "A Biodiesel Blend Handling Guide" to help diesel fuel users avoid potential cold weather problems.[5] The Cold Weather Team met most recently in January 2010 to discuss concerns with filter plugging in cold weather.

In August 2010 the full Task Force met to discuss a variety of issues including ASTM activities related to filter issues, results of biodiesel blend samples, new procedures created by industry for reporting problems, individual plant production reports and an update on compliance from the Minnesota Department of Commerce's Weights and Measures Division. Members reported on samples taken from problem fuels detected in western Minnesota and tested at the National Renewable Energy Laboratory (NREL); one sample indicated polymer contamination. Although polystyrene, polyethylene, and isoprene were mentioned, no conclusive identification of the exact polymer or source of the contamination was determined.

A checklist of background information to accompany problem fuels or filter samples sent in for analysis was also developed by the handling subcommittee. Previous samples were not accompanied by such information, making it difficult for investigators to determine the source of any contamination or fuel related problems. This list was presented to local and national entities having interest in such investigations. Portions of it will be used by investigators on subsequent fuel problems.

The Task Force has been crucial to the success of addressing the many complex issues that were bound to arise given the groundbreaking initiative of statewide biodiesel blend use in Minnesota's challenging climate. After various bumps in the road, at the time of publication of this report, the B5 mandate has gone smoothly this winter. We have heard no reports this year of biodiesel problems from Weights and Measures, the Petroleum Retailers or the Biodiesel Help Line.

Comments on this report from the Minnesota Biodiesel Task Force members can be found in Appendix A.

B5 Implementation

On May 1, 2009, in accordance with state law, Minnesota increased the amount of biodiesel blended into its fuel supply from 2 percent (B2) to 5 percent (B5).[6] The increase to B5 represents part of the state mandate to increase the biodiesel requirement to 10 percent by 2012 and 20 percent by 2015 (the 10

[4] The report can be found on the Minnesota Department of Agriculture website at https://www.mda.state.mn.us/news/publications/news/govrelations/biodieselcoldissues.pdf.
[5] The guide can be found on the Minnesota Department of Agriculture website at http://www.mda.state.mn.us/news/publications/renewable/biodiesel/biodieselblendguide.pdf.
[6] MS §239.77.

percent and 20 percent minimum content levels would be effective for the summer months only, unless it is determined that adequate federal standards or specifications exist for those level blends to be effective year-round).[7] To implement these minimum content requirements, several issues must first be addressed regarding biodiesel's cold weather functionality, the establishment of industry specifications for B10 and B20 (accomplished in 2008, as discussed below) and the price and supply of diesel and biodiesel. The state will only move to the next scheduled minimum content level specified in statute if certain conditions are met based on consideration of these issues.[8]

Based on past experience and testing by the Minnesota Department of Commerce, state and industry experts did not anticipate any difference between the cold weather performance characteristics of B2 blends and the B5 blends introduced in 2009. Moreover, as discussed in subsequent sections, industry specification includes B5 as "standard diesel fuel"—meaning it is safe for use in trucks, emergency and maintenance equipment and all diesel equipment provided quality standards are adhered to. Throughout the early part of the 2009-10 winter, a number of concerns were expressed by diesel fuel users indicating a variety of potential problems.[9] However, it was difficult for the state to determine the extent and cause of many problems due to inadequate background information about the origin and handling of the fuel and because complaints were spotty and/or specific to certain locations and applications. The Minnesota Department of Commerce's Weights and Measures Division developed technology for discerning a filter plugged by biodiesel components as compared to more conventional causes. This, along with better supporting information, should allow the state to more accurately determine the source of any potential biodiesel problems that are detected. During the winter of 2009-2010, biodiesel components were discovered in a number of plugged filters submitted to Weights and Measures, but at the time of this report no troublesome biodiesel components have been reported in fuel or filters for the 2010-11 winter.

In January 2010, Minnesota diesel fuel and biodiesel suppliers requested that Minnesota waive the B5 requirement for #1 diesel fuel; on January 15, the Minnesota Department of Commerce issued a waiver through March 31, 2010. The waiver was granted to allow the biodiesel industry and petroleum producing and distributing companies time to identify the root cause of the problems. The decision to grant a B5 waiver for #1 diesel fuels only was also made to accommodate certain diesel fuel consumers who use straight #1 diesel fuel in the winter months. #1 diesel fuel has better cold flow characteristics in the winter, but is more expensive and yields less energy content (and therefore less mileage) than #2 diesel fuel. The cold flow characteristics of straight #1 diesel fuels seem to be impacted by 5 percent biodiesel to a greater degree than #2 diesel or blends of #1 and #2 diesel fuel.[10] In addition, cold flow additives can be added to #2 diesel fuel or to blends of #1 and #2 diesel fuel to further improve product cold flow properties. Most state diesel fuel users have been well served by additives and blends of #1

[7] According to MS §239.77, subd. 2a: "The minimum content for the remainder of the year is five percent. However, if the commissioners of agriculture, commerce, and pollution control determine, after consultation with the biodiesel task force and other technical experts, that an American Society for Testing and Materials (ASTM) specification or equivalent federal standard exists for the specified biodiesel blend level in those clauses that adequately addresses technical issues associated with Minnesota's cold weather and publish a notice in the State Register to that effect, the commissioners may allow the specified biodiesel blend level in those clauses to be effective year-round."

[8] According to MS §239.77, subd. 2b, "the 10 and 20 percent minimum content levels become effective on the date specified only if the commissioners of agriculture, commerce, and pollution control publish notice in the State Register and provide written notice to the chairs of the House of Representatives and Senate committees with jurisdiction over agriculture, commerce, and transportation policy and finance, at least 270 days prior to the date of each scheduled increase, that certain conditions have been met (e.g., ASTM specifications exists, adequate supply is available, etc.) and the state is prepared to move to the next scheduled minimum content level."

[9] Reports of concerns came through the Minnesota Biodiesel Council, the Minnesota Petroleum Marketers Association, and the Minnesota Department of Commerce's Weights and Measures division.

[10] Common #1/#2 diesel fuel blends can be 50 percent #1 and 50 percent #2 diesel, or any other variation to meet the expected temperature ranges for the season.

and #2 diesel, thereby benefiting from better mileage, lower fuel costs and better cold weather performance with biodiesel blends.

ASTM Specifications

ASTM is the premier international industry association that designates quality specifications for a wide variety of industrial products including fuels and lubricants. Updates in 2008 to the existing ASTM "Standard Specification for Diesel Fuel Oils D975" incorporated biodiesel blends up to 5 percent. The specification D975-09 was not adapted into Minnesota Statutes, however, because of objections from some members of the petroleum industry who believed that adding 5 percent biodiesel into #1 diesel fuel would not allow that fuel to meet required distillation properties. An ASTM committee is currently working to resolve this issue; however, the state waiver for B5 in #1 fuel temporarily addresses this concern in Minnesota.

At a December 2010 meeting of the ASTM, a voluntary specification for a winter biodiesel product ("Grade #1B") was proposed as an amendment to D6751. This amendment included some of the same elements that were adopted in standards used by some Minnesota terminals and refiners. However, ASTM members had asked for specific additional data to document that such an amendment was needed and would be effective, but the data was not provided. Therefore the proposal was rejected and the amendment was not adopted. In the meantime, various suppliers who did not experience significant problems attributed to biodiesel elected not to adopt the more stringent requirements. Some industry members suggest that overly stringent requirements established without significant proof of need only increase the potential cost of biodiesel and reduce product fungibility in regional and national markets. These issues continue to be the subject of further debate.

Various refiners and terminals have their own standards for delivery of biodiesel and other products into their systems and these may actually be more stringent than ASTM specifications. In fact, biodiesel requirements among some Minnesota terminals and refiners are more stringent than ASTM D6751, but not all have adopted these strict requirements.

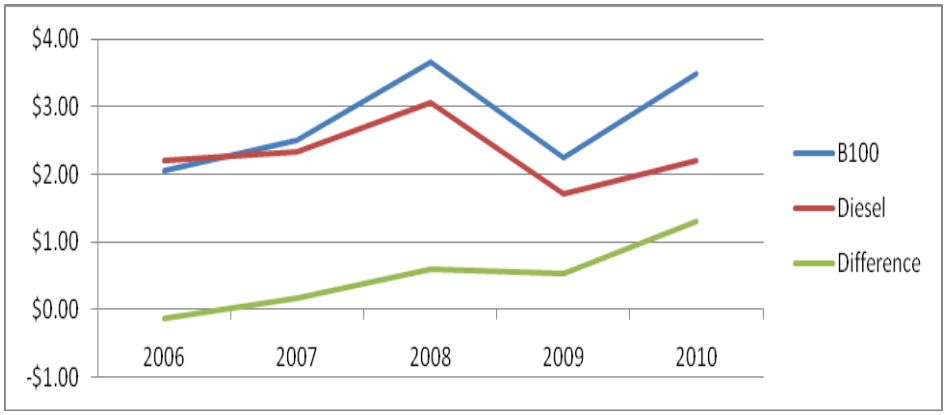
The existing ASTM "Standard Specification for Biodiesel Fuel Blend Stocks for Middle Distillate Fuels D6751" was also amended in 2008 to include the cold flow filtration test into the recommended test parameters to address cold flow issues. In addition, the federal government established a penalty for trading biodiesel not passing the cold flow filtration test that would be sold, transported or used after September 1, 2009. This stipulation may have greatly reduced the chances of finding off-spec biodiesel in the marketplace in the winter of 2010-11.

A new ASTM "Standard Specification for Diesel Fuel Oil, Biodiesel Blend (B6 to B20)" was approved in 2008 as D7467. The standard establishes specifications for biodiesel blends including B10 and B20, which are proposed for general usage in Minnesota in 2012 and 2015, respectively.

Biodiesel Prices

The price of biodiesel fuel has experienced volatility along with diesel fuel prices. A graph of the net average wholesale prices (at the rack)—adjusted to illustrate after-tax costs of B100 compared to the wholesale cost of diesel at major Minneapolis/St. Paul terminal locations—can be seen in Figure 1.

Figure 1. Diesel[11] and Biodiesel[12] Price Trends, 2006-2010.[13]



Source: Minnesota Department of Agriculture analyses of Axxis pricing data through August 13th, 2010.

From 2006 to 2010, the net after-tax cost of B100 to the blender has at times been lower and higher than the commensurate cost of diesel fuel. For example, in 2006 the net price of B100 was about 14 cents lower per gallon than the price of one gallon of diesel fuel, while it was 52 cents higher in 2009. To consumers buying biodiesel blends, however, these differences are not as dramatic as it might appear—Figure 2 demonstrates computed prices for biodiesel blends based on actual B100 and diesel prices at the rack, as follows:

Where:
Pb = Net price of one gallon of biodiesel to blender (after tax credit)
Pd = Price of one gallon of diesel at the rack
%b = Percent of biodiesel in blended fuel
%d = Percent of diesel in blended fuel

*(Pb * %b) + (Pd * %d) = Computed price of biodiesel blend*

For example, from May 1 to the end of 2009, the average net price of B100 to the blender was $2.2629 and the price of biodiesel at the rack was $1.9009. Thus, the price of one gallon of B5 is computed to be $1.9190—less than a two cent difference ($0.0181) above the price of diesel per gallon.

[11] Price of diesel at the rack (wholesale).
[12] For 2006 to 2009, the price of biodiesel is the rack (wholesale) price after the $1.00 federal tax credit. For 2010, prices reflect wholesale prices without the tax credit, although the value of Renewable Identification Numbers (RINs) for biodiesel has been equal to the tax credit value and the tax credit was retroactively reinstated in December 2010 through 2011.
[13] Generally, prices were recorded by Axxis daily (on business days). However, in 2006 prices were only recorded weekly and did not start until February for biodiesel and May for diesel. In 2007, diesel prices were consistently recorded on a daily basis throughout the year, while biodiesel prices were only recorded weekly from January through June and then daily for the remainder of the year. As such, average prices for 2006 and 2007 represented in the chart may be less consistent than those in subsequent years. In addition, from March 24, 2008 to May 2, 2008, data on the price of biodiesel was not available through the Axxis pricing service. After a review of data in May, Axxis determined that the increase in price was not an error, but actually reflected market conditions. Axxiss reestablished B100 prices effective May 2, 2008. To avoid the appearance of understating the price of biodiesel during that period, the average price of the last day of available data (March 28) and the first day of data (May 2) was inserted for the month of April. Prices for 2009 are through November 30th of that year.

Figure 2. Diesel[14] and Biodiesel Blend Prices (per gallon), 2006-2010. [15],[16]

Year (Blend Mandate)	Net Cost of B100 to Blender	Average Rack Price of Diesel	Computed Price of B2	Computed Price of B5	Net Price Impact of Biodiesel Blends
2006 (B2)	$2.0584	$2.1944	$2.1917	--	-0.27¢
2007 (B2)	$2.4983	$2.3388	$2.3420	--	0.32¢
2008 (B2)	$3.6607	$3.0538	$3.0659	--	1.21¢
2009 before May 1 (B2)	$2.2064	$1.4120	$1.4278	--	1.59¢
2009 after May 1 (B5)	$2.2629	$1.9009	--	$1.9190	1.81¢
2010* (B5)	$3.4915	$2.1974	--	$2.2621	6.47¢
2010** (B5)	$2.4915	$2.1974	--	$2.2121	1.47¢

*without federal tax credit
**with federal tax credit
Source: Minnesota Department of Agriculture analyses of Axxis Petroleum pricing data through August 13th, 2010.

The computed price of biodiesel blends has generally been between 1 and 2 cents higher per gallon than diesel fuel. Computed prices for B2 and B5 have tracked closely with actual prices for these fuels at the rack, which generally ranged from about 2 cents less to 6 cents more per gallon compared to diesel. These differences may be attributed to a variety of factors including the additional impact of the timing and length of marketing contracts; the marketing strategies of biodiesel producers, petroleum refiners, pipeline operators and position holders (marketers), the temporary loss of the federal tax credit; and the amortization of the cost of blending equipment installed at refiners and terminals.

Impact of Federal Tax Credit

Historically, biodiesel blenders have received a federal tax credit of $1.00 per gallon of biodiesel blended with diesel—but the credit expired at the end of 2009, significantly disrupting pricing and supply in the biodiesel markets. As demonstrated in the previous figures, the 2010 difference between the price of B100 without the tax credit and the price of diesel widened considerably from earlier years. The computed price of a gallon of B5 in 2010, without the tax credit, was about 6.5 cents higher than a gallon of diesel (see Figure 2).

The tax credit was retroactively reinstated for 2010 and through 2011 as a part of the Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010. Industry experts indicate that within 30 days of the bill's passage, the IRS is required to issue a notice providing for an expedited process to submit retroactive claims. Within another 30 days, the IRS must begin accepting claims for at least a six-month time period; claims must be paid within 60 days.[17]

[14] Price of diesel at the rack (wholesale).
[15] Generally, prices were recorded by Axxis daily (on business days). However, in 2006 prices were only recorded weekly and did not start until February for biodiesel and May for diesel. In 2007, diesel prices were consistently recorded on a daily basis throughout the year, while biodiesel prices were only recorded weekly from January through June and then daily for the remainder of the year. As such, average prices for 2006 and 2007 represented in the chart may be less consistent than those in subsequent years. From March 24, 2008 to May 2, 2008, data on the price of biodiesel was not available through the Axxis pricing service. After a review of data in May, Axxis determined that the increase in price was not an error, but actually reflected market conditions. Axxiss reestablished B100 prices effective May 2, 2008. To avoid the appearance of understating the price of biodiesel during that period, the average price of the last day of available data (March 28) and the first day of data (May 2) was inserted for the month of April. Prices for 2009 are through November 30th of that year.
[16] The figures for 2009 are based on the average of biodiesel blend prices before and after the switch from B2 to B5 on May 1, 2009.
[17] From the Oil Price Information Service (OPIS) newsletter (retroactive tax credit is available only to the "blender of record").

The difference in price between a gallon of B5 and a gallon of diesel at the rack in 2010 shrinks to about 1.5 cents when the tax credit is included in calculations.[18] Biodiesel marketers and/or blenders will receive the retroactive tax credit after filing appropriate documentation with the IRS. Some have stated their intensions to provide payments to return the credit to their customers after they receive it. This would mean that what was shown as an extra 6.5 cents per gallon in cost to consumers, should actually reduce that cost by 5 cents or more. It is not clear at this time that all blenders will do the same. If not, then some marketers and consumers may not benefit from the credit. The credit was extended for the entire year 2011 and should again reduce fuel cost to customers during that time.

Impact of RINs

The federal Renewable Fuel Standards (RFS2) program allocates Renewable Identification Numbers (RINs) to each gallon of biodiesel produced. RINs are assigned a value in the market when the fuel is blended and the RINs change hands. Each qualified gallon of biodiesel earns 1.5 RINs, which can be used by the blender to offset the cost of biodiesel. In December of 2010, the value of a biodiesel RIN was between 80 cents and 85 cents—therefore each qualifying gallon of biodiesel has a RIN equivalent value of about $1.25. This value is over and above the federal biodiesel tax credit ($1.00). Higher RIN values could likely be available up to the point where U.S. refiners have collected enough RINs to document their compliance with RFS2 requirements, after which RIN values could decline. RINs can also be carried forward into the next year; therefore, the exact behavior of the RIN market will be difficult to predict.

Summary

In general, the cost of biodiesel could be higher and/or the return to the producer could be lower based on the availability of tax credits, the value of RINs or other mitigating factors. These factors can also contribute to fluctuations in profitability, the loss of jobs and the price of B100 becoming uncompetitive with diesel, putting the industry at risk. RINs provided an offset that fully compensated for the loss of the federal tax credit in part of 2010 and have the capacity to do the same in 2012 if the tax credit is not extended beyond 2011. However, establishing RINs as a de-facto replacement for the tax credit could increase the volatility of biodiesel prices and plant profitability, adversely impacting small and farmer-owned plants. Total dependence on RINs could also work as a cap on renewable fuel production and use, possibly making smaller independent plants even more vulnerable to competition from larger entities.

Thus, the net cost of biodiesel to the blender (which could ultimately be passed onto the consumer) is dependent on a number of variables including unpublished wholesale customer discounts, term contract prices versus spot market differentials, the value of RINs, tax credits, profit margins and marketing strategies. The ability to manage these variables can add to the profitability of blending; thus, the "actual cost" of biodiesel to blenders is not always reflected by rack or retail prices alone.

Biodiesel Supply

The supply of biodiesel fuel to Minnesota terminals has generally been constant. Few, if any, B5 outages occurred because B100 was not available. More common reasons for blend outages were the lack of diesel fuel at terminals or the lack of winter blending equipment at some out-of-state terminals.

[18] With the tax credit reinstated, the cost of B100 would be $2.4915 ($3.4915 minus the $1.00 tax credit) and diesel was $2.1974; thus, [($2.4915*0.05) + ($2.1974*0.95)] - $2.1974 = 0.0147; thus, B5 would be only 1.5 cents more per gallon than straight diesel fuel.

In November 2009, Magellan announced plans to construct biodiesel blending infrastructure at its petroleum distribution terminal in Sioux Falls, SD. Those plans were put on hold after Minnesota regulators and legislators enacted provisions to waive the statutory biodiesel requirement for #1 diesel fuel in the colder months of the year.

In December 2010, Magellan reversed this decision under the expectation that Congress, under federal RFS2 regulations, and Minnesota's legislature are committed to their respective programs and mandates. As such, Magellan is now scheduled to complete construction of the biodiesel infrastructure at its Sioux Falls terminal in the second or third quarter of 2011. The availability of biodiesel blends at this terminal should provide petroleum marketers in the southwest portion of the state an additional option to comply with the statutory requirements for biodiesel sales in Minnesota.

Impact of Minnesota's Biodiesel Requirements

Production Capacity

Assuming 800 million gallons of annual state diesel fuel use, it is estimated that the B5 mandate requires 40 million gallons of biodiesel; the B10 mandate would require 80 million and the B20 mandate would require 160 million gallons of biodiesel to meet state blending requirements. The state's existing 65 million gallons of production capacity could therefore provide all the biodiesel necessary for B5, approximately 80 percent of the product needed for B10, and about 40 percent of that required for B20. Differences in the actual rate of state diesel fuel usage and gallons of state production will increase or decrease the percentage of biodiesel available from state producers.

Minnesota's biodiesel mandate was an important incentive leading to the establishment of the state's existing biodiesel production capacity of 65 million gallons. The requirement to further increase the minimum biodiesel content to B10 and B20 will no doubt be an important driver of additional state biodiesel production capacity. However, the temporary expiration of the federal tax credit caused many producers to struggle to meet production capacity. Moreover, without an extension of the federal tax credit beyond 2012, some investors may become discouraged. However, if the RIN value for biodiesel is used to reduce the cost of biodiesel to the consumer, this could bring profitability back to the biodiesel producer and restore investor confidence. At the time of this report, Minnesota plants were producing below capacity and one had temporarily stopped production. The U.S. Environmental Protection Agency (EPA) recently found that 52 U.S biodiesel plants, representing a production capacity of 600 million gallons, have been idled since the tax credit expired.

The prospect for new and increased biodiesel production capacity will also depend on developing markets and the relative price of organic fats and oils compared to diesel fuel. In September 2009, the EverCat Fuels biodiesel plant opened in Isanti with 3 million gallons of production capacity and plans to expand capacity to 30 million gallons in the future. If that expansion occurs, the state would have at least 93 million gallons of capacity, which would provide sufficient biodiesel for a statewide B10 blend and more than 50 percent of a B20 blend.

The RFS2 is likely to have additional impact on any increased production that occurs in Minnesota and elsewhere around the country. In November 2010, the EPA (which sets the rules for implementing the RFS2) significantly lowered the 2011 requirement for cellulosic biofuels (from 250 million gallons specified in the Clean Air Act to just 6.6 million gallons) while holding steady the 2011 requirements for biomass-based diesel (800 million gallons), advanced biofuels (1.35 billion gallons) and total renewable fuel volume requirements (13.95 billion gallons).[19] Cellulosic fuels and biomass-based diesel sold in excess of RFS2 requirements will count towards the advanced biofuel and total renewable fuel volume requirements. Given that biodiesel earns 1.5 RINs per gallon, the entire advanced biofuels requirement for 2011 could be fulfilled by 900 billion gallons of biodiesel.[20] Thus, the RFS2 could prove an important driver of biodiesel production throughout the United States.

[19] The requirements for advanced biofuels and and total renewable fuels are stated in terms of "ethanol equivalent" gallons. Corn-based ethanol has a RIN value of 1 for each gallon; however, if requirements are fulfilled by other types of fuels like biodiesel or cellulosic ethanol , the actual gallons required will differ based on the number of RINs assigned to each gallon of fuel.

[20] This figure is calculated by dividing the total advanced biofuels requirement of 1.35 billion gallons by 1.5, the RIN value assigned to biodiesel.

The RFS2 plus the considerable value of biodiesel RINs could be a potent force to greatly expand the use of biodiesel. Finally, while the recent cost of biomass oil has been high, the world crude oil market has also proven to be very unpredictable. Some experts have predicted that gasoline prices could exceed $4.00 per gallon before the end of 2011, which means that diesel fuel could be in excess of $4.50. There is, therefore, no guarantee that the cost of biodiesel will remain higher than that of diesel.

Feedstocks

The feedstocks used at biodiesel plants are generally determined by the price and availability of the various oil or fat products available and the ability of plants to process the oil being considered. Minnesota Soybean Processors (MnSP) in Brewster will use oil from their own soybean crushing plant. The SoyMor plant in Glenville has bought oil from various soybean oil producers; however, the plant has been inactive and is reported to be in the process of remodeling their 30 million gallon operation to allow for the processing of a wide variety of fats and oils. FUMPA in Redwood Falls is capable of using soy, spent cooking oil or animal fats from their own rendering operation. The EverCat fuels plant in Isanti reportedly has the capacity to produce biodiesel out of plant and animal fat, spent cooking oil, or even fatty acid materials from various industrial sources.

Although various lipid feedstocks can be used, the large soybean oil crushing capacity in Minnesota suggests that much of the feedstock used in Minnesota's biodiesel plants can be sourced from Minnesota soybean oil producers. Currently, high soy oil prices make this very difficult. The most current Minnesota Department of Agriculture report (2006) on soybean and biodiesel production impact on the state is available at:
http://www.mda.state.mn.us/news/publications/renewable/soyecoimpactsummary.pdf.

Appendix A: Minnesota Biodiesel Task Force Member Comments

FLINT HILLS resources

December 30, 2010

Flint Hills Resources thanks the Minnesota Biodiesel Task Force for the opportunity to provide comments for its annual report to the legislature on biodiesel. For your consideration, we provide the following summary comments and request that they be incorporated into the January 2011 report.

Flint Hills Resources Summary Comments:
Flint Hills Resources has ongoing concerns related to the use of biodiesel blends and the manner of implementation in Minnesota. We believe that the following areas of concern merit further evaluation by the Minnesota Biodiesel Task Force and the state of Minnesota.

1. The economic impact of biodiesel blends on Minnesota consumers and the state's economy.
2. The limited availability of commercially viable biodiesel produced in Minnesota that meets generally accepted quality standards.
3. Operability concerns of biodiesel blends in Minnesota's climate, particularly at increasing biodiesel blend content.
4. Enforcement of the biodiesel blending requirements.

Flint Hills Resources appreciates the opportunity to participate on the Minnesota Biodiesel Task Force and looks forward to working with the task force members and the state of Minnesota to further evaluate these areas of concern.

Sincerely,

Brett Webb
General Manager
Marketing and Commercial Development
Flint Hills Resources, LP

December 29, 2010

CHS Inc. appreciates the opportunity to provide comments to the Minnesota State Legislature. The CHS business spans petroleum refining, petroleum fuel and renewable fuel marketing, soybean processing, and other agriculture related businesses.

CHS remains committed to biodiesel. In order to ensure a high degree of customer success with biodiesel blends, CHS recently upgraded its proprietary biodiesel specification in two key areas:

1. Adopted a maximum .45 monoglyceride % wt specification factor
2. Implemented a 6 hour minimum oxidative stability factor (an increase from 4 hours)

These factors are above and beyond the current ASTM D6751 standard, but CHS firmly believes the improved factors have contributed to a positive end user experience with biodiesel blends this fall/winter.

CHS' biodiesel suppliers and distribution partners have worked diligently to maintain a biodiesel supply chain with the revised specification. I am pleased to report that as a result of these upgraded factors, there has been a drastic reduction in the number of end user complaints associated with biodiesel blends.

CHS recognizes there are pending revisions to ASTM D6751 that are complementary to the CHS specification. CHS is hopeful this revised standard is implemented. Furthermore, CHS supports the efforts of those involved in the ASTM proceedings to ensure fuel quality standards are maintained on a national basis.

Sincerely,

Dustin Haaland
Director, Renewable Fuels and Additives Supply
CHS Inc.