



MINNESOTA DEPARTMENT
OF AGRICULTURE

Report to the Legislature

Annual Report on Biodiesel

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Executive Summary

Minnesota currently blends all diesel fuel with 2 percent biodiesel—commonly referred to as B2. According to Minnesota Statutes §239.77, subd. 2, all diesel sold or offered for sale in Minnesota must contain 5 percent biodiesel (B5) by May 1, 2009, progressing to 10 percent (B10) in 2012 and 20 percent (B20) in 2015.^{1, 2} To implement the *10 percent* and *20 percent* biodiesel minimum content requirements, several issues must first be addressed. In particular, issues regarding biodiesel's cold weather functionality, industry specifications for biodiesel, and the price and supply of diesel and biodiesel all must be taken into consideration.

In 2003, Governor Pawlenty formed the Biodiesel Task Force, comprised of appointees from industry, academia, and various associations, to advise the Commissioner of Agriculture on implementing the 2 percent 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.

Pursuant to Laws of Minnesota for 2008 Ch. 279, Sec. 68 the Commissioner convened the Technical Cold Weather Issues Team to discuss issues to be addressed in anticipation of the use of higher biodiesel blends. On the recommendations of team members, three technical subcommittees were established to address specific implementation issues related to 1) production/distribution; 2) blending; and, 3) handling of biodiesel and petroleum diesel fuels. A progress report on the evaluation of cold weather issues by these subcommittees is scheduled for release February 15, 2009.

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) is the premier international industry association that designates quality specifications for a wide variety of industrial products including fuels and lubricants. New additions were recently made to existing ASTM standards that incorporate biodiesel blends up to B5 into the diesel fuel standard, add a cold weather test for B100, and establish specifications for higher blends of biodiesel including B10 and B20.

The price of biodiesel fuel has experienced volatility along with diesel fuel prices. Over the past several years, the net price of pure biodiesel (B100)³ has been at times lower and higher than the commensurate wholesale cost of diesel fuel. The average net wholesale cost of B100 over the past 3 years has been \$2.74, or about 21 cents per gallon higher than the price of diesel. This price difference would contribute about \$0.0044 to the price of a gallon of B2 blend.

¹ By law, the 10 and 20 percent minimum content levels are effective between April and October only. 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 The 10% and 20% 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 The net price is the price of biodiesel at the rack (wholesale) minus the \$1.00 federal tax credit to the blender.

The supply of biodiesel fuel to Minnesota terminals has generally been constant. Few if any B2 outages occurred at terminals because biodiesel fuel was not available; instead, common reasons for B2 outages include local diesel fuel outages and the lack of winter blending equipment at outstate terminals.

Minnesota's B2 mandate has provided an important incentive leading to the establishment of the state's existing biodiesel production capacity of 63 million gallons. The requirement to further increase the minimum biodiesel content to B5 and, ultimately, B20 is no doubt an important factor for those pursuing additional state biodiesel production capacity. The state's existing 63 million gallons of production capacity could provide all biodiesel necessary for B5, 75 percent of the product needed for B10, and about 37 percent required for statewide B20 requirements.

Feedstocks used in 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.

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.

Implementation of Minnesota's Biodiesel Requirements

Biodiesel Task Force/Cold Weather

It was determined at a Cold Weather Technical Team meeting that the cold weather issues and concerns posed during the meeting should be addressed by subcommittees comprised of technical experts in specific areas including the production, blending, distribution and handling of biodiesel, biodiesel blends and diesel fuel. Three subcommittees—Production/distribution, Blending, and Handling—were established and assigned topics from the Team. These subcommittees are currently in the process of addressing these assigned issues. Results of subcommittee activities are expected to include reports on fuel sampling and analysis, product availability and recommendations on best practices. A legislative report on the progress of these activities is scheduled by February 15, 2009.

A recurrent winter problem exists in Southwestern Minnesota where terminals in Sioux Falls, SD, which supply many Minnesota petroleum fuel dealers, are not equipped to blend biodiesel in the winter. As a result, distribution of biodiesel blends in the winter for portions of Southwest Minnesota is limited. An effort was made to establish winter blending facilities in areas without access to winter blending equipment. A \$300,000.00 biodiesel blending grant was authorized in the 2008 session. No applications for the grant were received after a request for proposals was issued, even after the deadline was extended for one week.

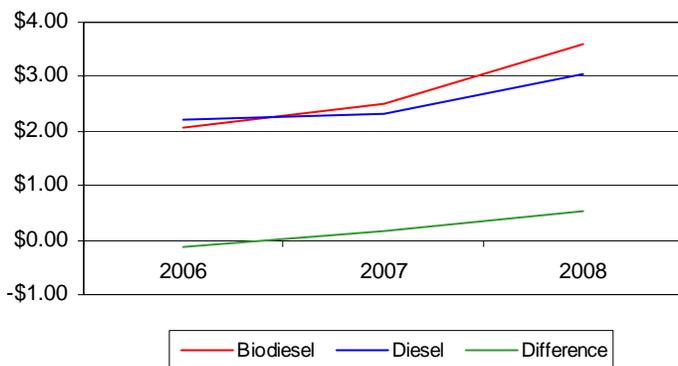
ASTM International Specifications

New additions were made to the existing ASTM standard “Specification for Diesel Fuel Oils D975” incorporating biodiesel blends up to 5 percent. The existing ASTM “Standard Specification for Biodiesel Fuel Blend Stocks for Middle Distillate Fuels D6751” added the cold flow filtration test initiated in Minnesota to address cold flow issues. Finally, a new ASTM “Standard Specification for Diesel Fuel Oil Blend (B6 to B20)” was approved as D7467 establishing specifications for biodiesel blends including B10 and B20 which are proposed for general usage in Minnesota in 2012 and 2015, respectively.

Price and Supply

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

Figure 1. Diesel⁴ and Biodiesel⁵ Price Trends, 2006-2008.⁶



In that period, the net after-tax cost of B100 to the blender has been at times lower and higher than the commensurate cost of diesel fuel. The impact of the cost of B100 on the cost of a biodiesel blends such as B2 can be described as follows:

If the net cost of B100 is \$1.00 higher than diesel, the computed net cost of the blend over the base diesel is \$0.01 per gallon for each percent of biodiesel in the blend. Therefore the computed cost of B2 made with B100 that is a full dollar per gallon more in net cost than diesel, and would be 2 cents more than the diesel fuel alone. The average net wholesale cost of B100 over the past 3 years has been \$2.74, or about 21 cents higher per gallon higher than the price of diesel. This means that the net increase in the cost of B2 compared to the cost of diesel fuel that is accountable to the higher cost of B100 amounts to \$0.0041 higher than diesel fuel. The actual difference between the net wholesale prices of biodiesel blends and diesel fuel includes the additional impact of the timing and length of marketing contracts, the marketing strategies of petroleum refiners, pipeline operators and position holders (marketers) and the amortization of the cost of blending equipment.

The supply of biodiesel fuel to Minnesota terminals has generally been constant. Few, if any, B2 outages were because B100 was not available. More common reasons for blend outages were the lack of diesel fuel or the lack of winter blending equipment at some out of state terminals.

⁴ Price of diesel at the rack (wholesale).

⁵ Price of biodiesel at the rack (wholesale), after \$1.00 federal tax credit.

⁶ From March 24, 2008 to May 2, 2008, data on the price of biodiesel was not available through the Axxis pricing service. The rapid increase in the price of biodiesel apparently caused a loss of data. After a review of data in May, Axxis determined that the increase in price was not an error, but actually reflected market conditions. Axxis 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.

Impact of Minnesota's Biodiesel Requirements

Production Capacity

Minnesota's biodiesel mandate was an important incentive leading to the establishment of the state's existing biodiesel production capacity of 63 million gallons. Promise of future expansions of the mandate are no doubt an important factor in current considerations by those pursuing additional state biodiesel production capacity. It is estimated that (for the purpose of discussion we will assume 800 million gallons of annual state diesel fuel use) the B5 mandate would require 40 million gallons, 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 63 million gallons of production capacity could therefore provide all biodiesel necessary for B5, 75 percent of the product needed for B10, and about 37 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.

The prospect for new biodiesel production capacity will depend on developing markets and the relative price of organic fats and oils compared to diesel fuel. Ever Cat fuels built a biodiesel production facility with new production technology in Isanti, Minnesota. The company plans installation of equipment this winter and production by spring.

Feedstocks

The origin of feedstocks used in biodiesel production at biodiesel plants is generally determined by the price and availability of the oil or fat to be used in the process. Minnesota Soybean Processors (MnSP) is likely to use oil from their own soy crushing plant, FUMPA is likely to use fats from their own recycling operation or from other oil suppliers, and SoyMor buys their oil from various producers. Although various feedstocks can be used, the large soybean oil crushing capacity in Minnesota suggests that much of the soy oil used in Minnesota biodiesel plants is likely to be sourced from Minnesota producers. The most current MDA report (2006) on soybean and biodiesel production is available at www.mda.state.mn.us/news//publications/renewable/soyecoimpacts/wummary.pdf.