DEPARTMENT OF AGRICULTURE

Annual Report on Biodiesel

(As required by MINN. STAT. 239.77, subdivision 5a)

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The estimated cost of preparing this report (as required by MINN. STAT. 3.197) is $1,200.

Executive Summary

As required by the Biodiesel Content Mandate (MINN. STAT. 239.77, subdivision 5a), this report contains information on:

- Implementation of the minimum content requirements of the statute.
- The price and supply of biodiesel fuel.
- The impacts of the biodiesel mandate on:
    - The development of biodiesel production capacity in the state.
    - The use of feedstock grown or raised in the state for biodiesel production.

Biodiesel is defined as (MINN. STAT. 239.77, subdivision 1b):

> "…a renewable, biodegradable, mono alkyl ester combustible fuel that is derived from agricultural and other plant oils or animal fats that meets American Society of Testing and Materials (ASTM) specification D6751-11b for Biodiesel Fuel (B100) Blend Stock for Distillate Fuels..."

Biodiesel in Minnesota is produced from soybeans, corn, and recycled fats, oils, and greases. In general practice, biodiesel is blended with diesel fuel.

Implementation of the minimum content requirements of the statute

Minnesota was the first state in the U.S. to require the use of biodiesel. Through its Biodiesel Content Mandate statute, Minnesota has a requirement for all No. 2diesel fuel sold or offered for sale to have a certain minimum biodiesel content. The initial content requirement, passed in 2002 and implemented in 2005, was a 2% biodiesel blend (B2). The current content requirement is 20% (B20).

The statute was amended in 2008 to add provisions for moving the blending requirement to 5%, 10%, and 20% (B5, B10, and B20). The B10 and B20 minimum content requirements are effective only during the warm-weather months of April through September. The content level reverts to B5 during the cold-weather months of October through March, when changes in viscosity of diesel fuels (known as "gelling" or "waxing") can cause performance problems in engines.

The statute also provides that, before the B10 or B20 content levels can be implemented, the commissioners of the Minnesota Department of Agriculture, Minnesota Department of Commerce, and the Minnesota Pollution Control Agency must determine whether four statutory conditions have been met. These conditions involve federal standards for blend specifications, the production capacity of biodiesel in Minnesota, the amount of infrastructure and regulatory protocol for biodiesel blending, and the source of feedstocks.

There are also safeguards (sometimes referred to as "off ramps") written into the law that allow for adjustments to the mandate if certain circumstances occur. These "off ramps" include a temporary suspension by the commissioner of commerce if there is a shortage of fuel or a problem with fuel quality, and an adjustment of the mandate by Governor's Executive Order if a price disparity will cause economic hardship to retailers of diesel fuel.

B5 was implemented in 2009, B10 was implemented in 2014, and B20 was implemented in 2018.

Price and supply of biodiesel fuel

The price of diesel fuel offered for sale in Minnesota is affected by multiple factors, including the price of components (petroleum diesel and biodiesel), and state and federal policies. Most important among federal policies are the Renewable Fuel Standard and the Biodiesel Blenders Tax Credit.

The supply of biodiesel is affected by blending requirements, federal policy, and the demand for biodiesel from retailers, driven in part by the state mandate.

This report provides information on the prices and supply of biodiesel and factors affecting price and supply.

Impacts of the biodiesel minimum content requirements

It is not possible to demonstrate a cause-and-effect relationship between the minimum content requirements and production capacity or feedstock use. It is, however, reasonable to assume that the minimum content requirements have had a significant effect on both production and feedstock use.

Production capacity and feedstock use in 2016 were summarized in the Minnesota Department of Agriculture's May 2017 report, *Economic Impact of the Minnesota Biodiesel Industry*. According to the report:

- Production had increased from the amount represented by the initial B2 minimum content requirement—16 million gallons per year (mgy)—to 74 mgy in 2016.
- Production was from diverse feedstocks: soybeans were the feedstock of 45% of biodiesel in the state, while other oils, fats, and greases comprised the remaining 55% of the feedstock.
- Biodiesel consumption in Minnesota in 2016 was 77 million gallons (mg), representing nearly 8% of the 1 billion gallons per year of diesel consumption in Minnesota. The amount of biodiesel produced in Minnesota was 74 mg, representing 96% of consumption.

Introduction

This report is required by the Minnesota Legislature (MINN. STAT. 239.77, subdivision 5a):

> "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 minimum content requirements 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

Biodiesel is defined as (MINN. STAT. 239.77, subdivision 1b):

> "…a renewable, biodegradable, mono alkyl ester combustible fuel that is derived from agricultural and other plant oils or animal fats that meets American Society of Testing and Materials (ASTM) specification D6751-11b for Biodiesel Fuel (B100) Blend Stock for Distillate Fuels..."

In general practice, biodiesel is blended with diesel fuel. According to ASTM International (formerly known as the American Society of Testing and Materials), diesel fuel (ASTM D975) can contain up to 5% biodiesel. A separate standard exists for blends of B6 to B20 (ASTM D7467).

Biodiesel in Minnesota is produced from soybeans, corn, and recycled fats, oils and greases. Biodiesel production adds value to all these commodities.

Biodiesel is considered an advanced biofuel as well as "biomass-based diesel" in the Renewable Fuel Standard's classification of renewable fuels. Advanced biofuels under that classification must demonstrate at least a 50% greenhouse gas benefit over the fossil fuel that it replaces. Biodiesel has a positive energy balance, producing 5.54 units of energy for every unit of fossil energy consumed over its lifecycle.[1] Biodiesel produced from waste and recycled oils has some of the lowest carbon intensity ratings in the California Air Resources Board system because of its ability to reduce greenhouse gas emissions.

[1] A. Pradhan et al. *Energy Life-Cycle Assessment of Soybean Biodiesel Revisited*. Transactions of the ASABE, Vol. 54(3), pages 1031-1039.

Minnesota has a minimum content requirement for all No. 2[2] diesel fuel sold or offered for sale in the state. No. 2 diesel fuels sold in Minnesota are required to have minimum biodiesel content of 20% (a biodiesel blend known as "B20") during the warm-weather months of April through September. The content level reverts to a blend of 5% biodiesel (B5) during the cold-weather months of October through March, when changes in viscosity of diesel fuels (known as "gelling" or "waxing") can cause performance problems in engines. However, from April 1 through April 14, fuel sellers are allowed a minimum blend of 10% biodiesel (B10) to provide "ramp-up time" to transition their diesel inventory from B5 to B20, so the actual effective date of the B20 content requirement is April 15. In summary, the content requirements are:

- October 1 through March 31: B5
- April 1 through April 14: B10
- April 15 through September 31: B20

The Minnesota Department of Agriculture (MDA) established the Biodiesel Task Force in 2003 to help the state carry out its biodiesel minimum content requirements. Since then, the task force has met on an ad-hoc basis to discuss issues related to biodiesel production and its 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 was appointed in August 2019 and expires June 30, 2021. Task force members apply through the Minnesota Secretary of State's Open Appointments process.

The current members include:

- Bart Giangiacomo, Transport America (Fuel User Group Member)
- Tim Gross, Minnesota Petroleum Marketers Association (Petroleum Industry Representative)
- Dustin Haaland, CHS Inc. (Petroleum Industry Representative)
- Scott Hedderich, REG Company, Chairperson (Processing Industry Representative)
- Bruce Heine, Magellan Midstream Partners, LP (Petroleum Industry Representative)
- Chris Hill, Minnesota Soybean Growers Association (Grower's Organization Representative)
- Jon Hunter, American Lung Association in Minnesota (Environmental Organization Representative)
- Ronald Marr, Minnesota Soybean Processors (Processing Industry Representative)
- Julie Quinn (At Large Member)
- Kevin Paap, Minnesota Farm Bureau (Farm Organization Representative)
- Steve Rupp, Ever Cat Fuels (Processing Industry Representative)
- Michael W. Stutelberg, AURI (Research Institution Representative)
- Brett Webb, Flint Hills Resources, LP (Petroleum Industry Representative)

[2] There are three different classes of diesel fuel based on the ability of the fuel to flow ("viscosity" and "pour point"). No. 2 diesel (often shown as "#2") is standard diesel fuel used in warm-weather months. No. 1 (#1, a.k.a. kerosene) diesel is a lighter fuel which is often mixed with No. 2 diesel in winter months. No 1 diesel is exempt from the biodiesel content mandate. No. 4 (#4) diesel is a heavy fuel not typically used in vehicles.

- Gary Wertish, Minnesota Farmers Union (Farm Organization Representative)
- Darrick Zarling, University of Minnesota (Research Institution Representative)

No Biodiesel Task Force members provided comments to be included in this year's report.

Economic, health, and environmental benefits of biodiesel

The MDA's 2017 study, *Economic Impact of the Minnesota Biodiesel Industry* (found on the MDA Biodiesel webpage, www.mda.state.mn.us/renewable/biodiesel), determined that the economic impact of Minnesota's 2016 biodiesel production, including direct, indirect, and induced impacts, was $1.7 billion. The total employment impact was estimated as 5,397 jobs. One million gallons of biodiesel production was found to contribute $2.8 million in statewide economic output, supporting 73 jobs.

According to the study, Minnesota currently ranks eleventh among U.S. states in biodiesel production. Due to improved efficiencies at the plants, total Minnesota biodiesel plant capacity has increased from an original nameplate capacity of 63 million gallons per year (mgy) to 87.8 mgy (see Table 1 on page 11).

According to the National Biodiesel Board, biodiesel increased the value of a bushel of soybeans by 63 cents between 2006 and 2015. This increased the value of soybean oil to U.S. farmers by $18.8 billion and decreased the price of soybean meal (primarily used as a protein source in animal feeds) by up to $48 per ton.

The use of biodiesel and biodiesel/diesel blends reduces almost all forms of air pollution compared to petroleum diesel, with the most important reductions being air toxics and cancer-causing compounds. Biodiesel also reduces greenhouse gas emissions due to its production from recently grown plant materials, in contrast to fossil fuels that have been sequestered in the earth for millions to billions of years.[3]

Performance of biodiesel in vehicles

B5 has been used in winter months since it was first implemented in Minnesota in 2009. The current standard for diesel fuel, ASTM D975, includes up to 5% biodiesel content.

The current blending requirement for B20 was implemented on May 1, 2018. It is in effect for the warm-weather months of April through September, and then reverts to B5 for the cold-weather months of October through March, when changes in viscosity of diesel fuels (known as "gelling" or "waxing") can cause performance problems in engines.

The Diesel Help Line is a privately-operated service available to Minnesotans who experience problems with diesel fuel of any type. Anyone experiencing a problem with diesel fuel is encouraged to call and, if needed, arrange to submit samples to the Help Line. Diesel fuel problems are analyzed to determine

[3] Biodiesel-Clean, Green Diesel Fuel. U.S. DOE by the National Renewable Energy Laboratory. July 2015 (https://www.afdc.energy.gov/fuels/biodiesel.html).

the root cause, and, when possible, are traced to a specific fueling source. A summary of calls to the Diesel Help Line can be found in Appendix A.

The MDA publishes a brochure entitled *Understanding Minnesota's Biodiesel Requirement: A user's guide for biodiesel blends from B5-B20* and a booklet entitled *Minnesota B20 Handling Guide*. Available in paper copy and on the MDA's website (www.mda.state.mn.us/renewable/biodiesel), the brochure provides information to consumers on use of higher biodiesel blends, and the booklet provides useful information for retailers for getting ready for both the B20 and winter biodiesel blend seasons.

Implementation of the Biodiesel Minimum Content Requirements

Minnesota was the first state in the U.S. to require the use of biodiesel. The original biodiesel minimum content requirement, adopted in 2002 (Laws of Minnesota 2002, chapter 244), specified blending of at least 2% biodiesel fuel oil with all diesel transportation fuel sold or offered for sale in Minnesota. The implementation date was September 29, 2005.

In 2008, the Minnesota Legislature amended the statute to add provisions for moving the blending requirement to 5%, 10%, and 20% (Laws of Minnesota 2008, chapter 297, article 1, section 51). All three dates were set to May 1: 2009 for B5, 2012 for B10, and 2015 for B20. B5 was implemented on May 1, 2009.

B10 and B20 minimum content requirements

The Biodiesel Use Mandate statute (MINN. STAT. 239.77) provides that the 10% and 20% (B10 and B20) minimum content levels go into effect only after the commissioners of the Minnesota Department of Agriculture (MDA), Minnesota Pollution Control Agency (MPCA), and Minnesota Department of Commerce (Commerce) have consulted with the Biodiesel Task Force and determined that four conditions specified in the law had been met, notice has been published in the State Register, and notice has been provided to certain specified legislative chairs. These conditions in statute are:

(1) an American Society for Testing and Materials specification or equivalent federal standard exists for the next minimum diesel-biodiesel blend;

(2) a sufficient supply of biodiesel is available, and the amount of biodiesel produced in this state from feedstock with at least 75% that is produced in the United States and Canada is equal to at least 50% of anticipated demand at the next minimum content level;

(3) adequate blending infrastructure and regulatory protocol are in place in order to promote biodiesel quality and avoid any potential economic disruption; and

(4) at least 5% of the amount of biodiesel necessary for that minimum content level will be produced from a biological resource other than an agricultural resource traditionally grown or raised in the state, including, but not limited to, algae cultivated for biofuels production, waste oils, and tallow.

There are also safeguards (sometimes referred to as "off ramps") written into the law that allow for adjustments to the minimum content requirements if certain circumstances occur. These "off ramps" include a temporary suspension by the commissioner of commerce if there is a shortage of fuel or a

problem with fuel quality, and an adjustment of the minimum content requirements by Governor's Executive Order if a price disparity will cause economic hardship to retailers of diesel fuel.

The B10 blending date was postponed in 2011 due to inadequate blending infrastructure, specifically in the southwest region of the state, and due to inadequate regulatory protocol. The opening of a biodiesel blending site in Sioux Falls, S.D., in late 2012, and the institution of new regulatory protocol that tracked the biodiesel content in all shipments of fuel, cleared the way for the B10 blending level to be approved. B10 was implemented on July 1, 2014.

In July 2017, after an interagency review, and in consultation with the Minnesota Biodiesel Task Force, stakeholders, and technical experts, the three agency commissioners (MDA, Commerce, and MPCA) determined that the four conditions had been met. Minnesota implemented the B20 content requirement on schedule on May 1, 2018, although shortly thereafter, the commissioner of commerce used one of the previously mentioned "off ramps" (MINN. STAT. 239.77) to temporarily suspend the B20 minimum content requirement (allowing the content requirement to remain at B10) due to a short-term problem with biodiesel supply. The B20 content requirement resumed on July 1.

The statute was amended in 2018 to provide the previously mentioned "ramp-up time" of April 1 through April 14, in which a blend of B10 may be sold. This provides an opportunity for fuel sellers to transition their diesel inventory from B5 to B20.

Price and Supply of Biodiesel

In addition to market forces, the price of diesel fuel offered for sale in Minnesota is affected by factors including the price of components (petroleum diesel and biodiesel), state and federal policies, and most importantly, the federal Renewable Fuel Standard and the Biodiesel Blenders Tax Credit.

The supply of biodiesel is affected by blending requirements, federal policy, and the demand for biodiesel from retailers, driven in part by the state minimum content requirements.

This section will briefly describe the federal policy drivers of biodiesel prices and supply, and then will provide information on prices and supply.

Federal policy and its influence on biodiesel price and supply

As stated above, the most important federal policies affecting price and supply are the Renewable Fuel Standard and the Biodiesel Blenders Tax Credit, which together effectively lower the net price of unblended biodiesel fuel (B100).

The Renewable Fuel Standard (RFS), Renewable Identification Numbers (RINs), and Renewable Volume Obligations (RVOs)

In 2007, the federal Energy Independence and Security Act was passed by Congress and signed by President George W. Bush, revising the Renewable Fuel Standard (RFS, now RFS2) that was already in place. This law requires refiners and/or importers of petroleum (also known as obligated parties) to blend increasing volumes of biofuels on an annual basis. Volumes (Renewable Volume Obligations or

RVOs), set by Congress and modified by the U.S. Environmental Protection Agency, are divided proportionally among all obligated parties, giving each obligated party a total amount of biofuel that they will need to show compliance for blending.

Every gallon of biofuel produced that qualifies for RFS2 carries with it a Renewable Identification Number (RIN). The RIN is used by the obligated party to show compliance with RFS2. RINs can be used (or "retired") by an obligated party in two ways:

1. Gallons of biofuel are blended with petroleum fuels. Once biofuel is blended, the RIN can be "separated" from the fuel with which it is associated and retired.
2. RINs can be purchased in the RIN market. Obligated parties that blend more fuel than their obligation requires, or fuel distributors that are not refiners and/or importers of petroleum (also referred to as "third party blenders"), can sell RINs into the market after fuel is blended.

In the second case above, the value obtained by selling the RIN represents another income stream for the obligated party who has met their obligation, or a third-party blender who has no obligation under RFS2.

Federal Biodiesel Blenders Tax Credit

The federal Biodiesel Blenders Tax Credit was first implemented in 2005. This allowed blenders of biodiesel and renewable diesel (renewable diesel being ASTM D975 specification renewable fuel) to claim $1 per gallon against their federal tax liability. The tax credit expired at the ends of 2009, 2011, 2013, and 2016. In the years 2009, 2011, 2013, and 2018, the tax credit was reinstated late in the next year (or very early in the following year) and made retroactive, such that all years from 2005 through 2017 were covered by the credit. On December 17, 2019, Congress approved the tax credit with the President signing the bill on December 23, making the credit retroactive for 2018 and 2019, and extending through 2022.

Price

The MDA subscribes to weekly reports on oil prices (prepared by the Oil Price Information Service by HIS Markit using AXXIS software). Figure 1 shows "rack prices" of unblended No. 2 diesel fuel and average prices of biodiesel blends and Minneapolis-St. Paul terminals (see Appendix B: Table 2 for price data). The prices of diesel fuel and biodiesel blends track closely. Both were clearly affected by the downturn in transportation fuel sales in the spring of 2020 caused by responses to the COVID-19 pandemic.

Figure 1. No 2 diesel and biodiesel blend (B5, B10, and B20) end-of-week average rack prices for Minneapolis-St. Paul (Source: Oil Price Information Service by HIS Markit). Prices shown only for weeks in which the respective content requirements are in effect.

Supply

Monthly biodiesel production numbers are available from the U.S. Energy Information Agency by Petroleum Administration for Defense District (PADD). Minnesota is included in PADD2 (Midwest), which also includes Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin. Figure 2 shows the production trend for 2020 for PADD2 (see Appendix B: Table 3 for production data).

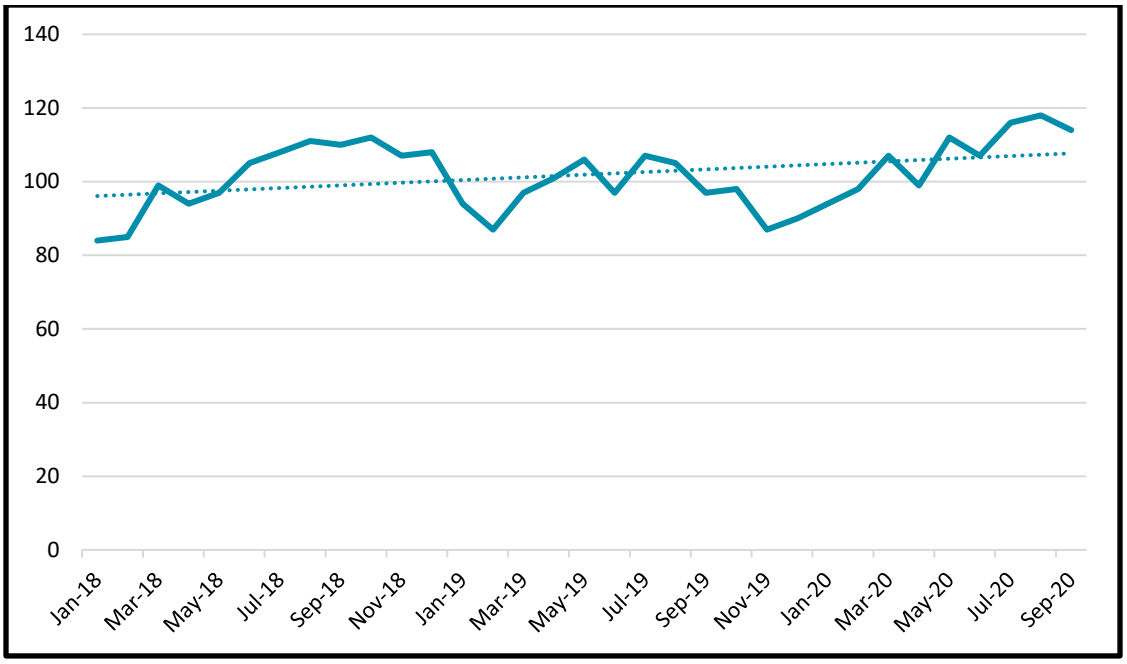

Figure 2: Midwest biodiesel (B100) production, January 2018 through September 2020 (in millions of gallons) (Source: U.S. Energy Information Agency). Trendline shows upward trend in production.

The nameplate capacity (the capacity that the three Minnesota biodiesel plants were constructed to originally produce) is 63 mgy. Recent expansion and efficiency improvements have allowed the plants to increase production levels. The current capacity recognized by the Minnesota Pollution Control Agency totals 87.8 mgy. Table 1 shows a breakdown of these capacities by plant.

Table 1. Current Minnesota biodiesel plant production capacities.

Plant – Location	Production Capacity (mgy)
Ever Cat Fuels – Isanti	3.3
Minnesota Soybean Processors – Brewster	40.5
Renewable Energy Group (REG) – Albert Lea	44.0
Total	87.8

The Biodiesel Content Mandate specifies:

> "At least five percent of the amount of biodiesel necessary for that minimum content level will be produced from a biological resource other than an agricultural resource traditionally grown or raised in the state, including, but not limited to, algae cultivated for biofuels production, waste oils, and tallow."

Where the majority of biodiesel was produced from soybeans in the early days of Minnesota's minimum biodiesel blending requirement, production now uses a variety of feedstocks. Minnesota Soybean Producers is a full-crush soybean processing facility and uses soybean oil exclusively for its biodiesel production. Ever Cat Fuels' 3 mgy plant uses a high temperature, high pressure catalytic transesterification process, and uses alternative feedstocks such as recycled oils. REG Company upgraded its plant to process a wide variety of oil feedstocks. In recent years REG has used distiller's

corn oil with a minority amount of used cooking oil and other alternative feedstocks. The overall trend for Minnesota facilities has been increased diversification of feedstocks, such that non-traditional agricultural oil feedstock is currently higher than 5% for the total biodiesel produced.

Occasionally, there are disruptions in biodiesel supply, typically related to equipment or tank maintenance. Low biodiesel supplies at terminals can cause outages for individual distributers, which can cause distributors to purchase biodiesel at another terminal, or outside the terminal distribution system through a third-party blender or by going directly to the biodiesel plants. The statute provides for fuel suppliers to obtain a waiver from the Minnesota Department of Commerce (Commerce) should there be a period of biodiesel fuel shortage or a problem with biodiesel quality.

Under this waiver authority, Commerce issued seven waivers in 2020. Two were issued during the B5 content requirement period; one of which was due to unplanned maintenance and the other due to planned outage. One waiver occurred during the B10 "ramp-up" period and was due to a planned outage. There were four outages during the B20 content requirement period, all due to supply constraints. All the waivers were a half day or less in duration. A list of all biodiesel waivers in 2020 is included in Appendix C.

Additionally, there was a waiver issued by Commerce due to the peacetime authority related to COVID-19 and under authority of House File 4531 (which authorized the commissioner of commerce to delay, stay, or waive certain deadlines). The waiver, under Regulatory Guidance 20-05, effectively delayed beginning of the B10 "ramp-up" period until April 15, and delayed enforcement of the B20 content period until May 1.

Impacts of Biodiesel Minimum Content Requirements on Production Capacity and Feedstocks

It is not possible to demonstrate a cause-and-effect relationship between the minimum content requirements and production capacity or feedstock use. It is, however, reasonable to assume that the minimum content requirements have had a significant effect on both production and feedstock use.

Production capacity and feedstock use in 2016 were summarized in the Minnesota Department of Agriculture's May 2017 report, *Economic Impact of the Minnesota Biodiesel Industry*. According to the report:

- Production had increased from the amount represented by the initial B2 minimum content requirement (16 mgy) to 74 mgy in 2016.
- Production was from diverse feedstocks: soybeans were the feedstock of 45% of biodiesel in the state, while other oils, fats, and greases comprised the remaining 55% of the feedstock.
- Biodiesel consumption in Minnesota in 2016 was 77 mg, representing nearly 8% of the 1 billion gallons per year of diesel consumption in Minnesota. The amount of biodiesel produced in Minnesota was 74 mg, representing 96% of consumption.

Over the time period since the B20 minimum content requirement has been in effect, the amount of biodiesel produced in Minnesota has exceeded 50% of biodiesel consumption in the state.

Appendix A: Summary of calls to Diesel Help Line

Date: January 5, 2021

To: Bob Patton, Minnesota Department of Agriculture

From: Lisa Pedderson, MEG Corp

Re: Minnesota Diesel Helpline 2020 Summary

The Minnesota Diesel Helpline serves as a resource to assist individuals and organizations with diesel fuel questions, provide guidance regarding fuel storage and handling best practices and investigate the cause of fuel-related issues through testing and analysis. Diesel fuel suppliers, retailers and end-users are encouraged to contact the Helpline regarding any cold weather or other diesel fuel question or issue.

Questions received by the Helpline in 2020 often involved guidance for blending transitions in spring and fall, best practices for application of additives and clarifications regarding the state biodiesel requirements.

Following is a summary of the issues handled by the Minnesota Diesel Helpline in 2020 as determined by testing and analysis of fuel and filter samples:

Issue	Percentage
No problem with fuel	42%
High water	36%
Oxidation	9%
Microbial contamination (without the presence of water)	5%
Sediment	3%
Other	2%
Fuel not blended for winter	2%
Could not be determined with sample provided	2%
Biodiesel contaminants	0%
Total (not equal to 100% due to rounding)	*101%*

For the cases submitted to the Helpline in 2020 in which testing confirmed an issue was present in the fuel itself, water contamination was indicated in more than 60 percent of the cases, including those submitted by end-users (fleets, farmers, individuals) and from fuel distributor or retail locations. Water in diesel fuel can lead to a variety of fuel issues and filter plugging problems, including icing, microbial growth, fuel degradation, corrosion, and stripping of glycerin from biodiesel. Microbial contamination was present in several additional samples submitted; however, the original cause of the contamination was the presence of water. Checking tank bottoms annually is an important practice to prevent water contamination and the corresponding issues that result from it.

Of the many issues the Helpline did troubleshoot in 2020, 42 percent did not indicate a problem with the fuel sample submitted, suggesting the problem may be mechanical, present in another fuel source not submitted, or due to another factor not attributed to the fuel characteristics, such as fueling infrastructure set up, filter type, etc.

Most of the issues listed above can be prevented by following recommended best practices. The Minnesota Diesel Helpline continues to provide best practices education and training for fuel suppliers and end users and encourages interested parties to contact the Helpline at (800) 929-3437 or info@megcorpmn.com.

Appendix B: Price and Production Data

Table 2. No 2 diesel and biodiesel blend (B5, B10, and B20) end-of-week average rack prices for Minneapolis-St. Paul (Source: Oil Price Information Service by HIS Markit). Prices shown only for weeks in which the respective content requirements are in effect.

Week ending	#2 diesel	B5	B10	B20
1/3/2020	$2.02	$2.02		
1/10/2020	$1.93	$1.95		
1/17/2020	$1.84	$1.85		
1/24/2020	$1.80	$1.81		
1/31/2020	$1.65	$1.66		
2/7/2020	$1.70	$1.71		
2/14/2020	$1.77	$1.78		
2/21/2020	$1.79	$1.81		
2/28/2020	$1.62	$1.64		
3/6/2020	$1.62	$1.63		
3/13/2020	$1.32	$1.34		
3/20/2020	$1.16	$1.16		
3/27/2020	$1.17	$1.17		
4/3/2020	$1.11	$1.10	$1.13	
4/10/2020	$1.10		$1.10	
4/17/2020	$1.06		$1.10	$1.10
4/24/2020	$0.84			$0.90
5/1/2020	$0.88			$0.94
5/8/2020	$0.90			$0.96
5/15/2020	$0.94			$0.94
5/22/2020	$0.97			$1.05
5/29/2020	$0.91			$1.04
6/5/2020	$1.08			$1.13
6/12/2020	$1.16			$1.22
6/19/2020	$1.28			$1.28
6/26/2020	$1.20			$1.23
7/3/2020	$1.28			$1.25
7/10/2020	$1.26			$1.29
7/17/2020	$1.25			$1.28
7/24/2020	$1.28			$1.24
7/31/2020	$1.25			$1.28
8/7/2020	$1.27			$1.23
8/14/2020	$1.28			$1.24
8/21/2020	$1.29			$1.26
8/28/2020	$1.27			$1.24
9/4/2020	$1.26			$1.26
9/11/2020	$1.19			$1.22
9/18/2020	$1.30			$1.22
9/25/2020	$1.25			$1.23

Week ending	#2 diesel	B5	B10	B20
10/2/2020	$1.25	$1.31		$1.23
10/9/2020	$1.31	$1.31		
10/16/2020	$1.31	$1.28		
10/23/2020	$1.27	$1.30		
10/30/2020	$1.19	$1.26		
11/6/2020	$1.32	$1.24		
11/13/2020	$1.40	$1.27		
11/20/2020	$1.45	$1.40		
11/27/2020	$1.51	$1.40		
12/4/2020	$1.54	$1.44		
12/11/2020	$1.61	$1.49		
12/18/2020	$1.67	$1.55		
12/25/2020	$1.66	$1.64		

Table 3: Midwest biodiesel (B100) production, January 2018 through September 2020 (in millions of gallons) (Source: U.S. Energy Information Agency)

Month/Year	Biodiesel (B100) production (million gallons)
Jan-2018	84
Feb-2018	85
Mar-2018	99
Apr-2018	94
May-2018	97
Jun-2018	105
Jul-2018	108
Aug-2018	111
Sep-2018	110
Oct-2018	112
Nov-2018	107
Dec-2018	108
Jan-2019	94
Feb-2019	87
Mar-2019	97
Apr-2019	101
May-2019	106
Jun-2019	97
Jul-2019	107
Aug-2019	105
Sep-2019	97
Oct-2019	98
Nov-2019	87
Dec-2019	90
Feb-2020	98
Mar-2020	107
Apr-2020	99
May-2020	112
Jun-2020	107
Jul-2020	116
Aug-2020	118
Sep-2020	114

Appendix C: 2020 Waivers Issued by the Minnesota Department of Commerce

Reason	Minimum Content Requirements Level	Begin	Duration (hrs.)	Duration (days)
Unplanned Maintenance	B5	2/10/20 4:00	5:45:00	0.25
Planned Outage	B5	3/29/20 18:00	12:15:00	0.5
Planned Outage	B5	4/9/20 8:00	5:45:00	0.5
Supply Constraint	B20	6/29/20 12:00	3:45:00	0.2
Supply Constraint	B20	7/13/20 9:00	8:00:00	0.3
Supply Constraint	B20	8/23/20 10:00	4:00:00	0.2
Supply Constraint	B20	8/24/20 10:00	6:00:00	0.3