



Annual Report on Biodiesel

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

01/15/2025

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Contents

- Introduction.....1
- Background.....1
 - Diesel basics.....1
 - What is “biodiesel”1
 - Biodiesel in Minnesota1
 - Performance of biodiesel in vehicles.....2
 - The Biodiesel Task Force2
 - Economic, health, and environmental benefits of biodiesel.....2
- Implementation of the Biodiesel Minimum Content Requirement3
 - B10 and B20 minimum content requirements.....3
- Price and Supply of Biodiesel4
 - Price4
 - Supply5
- Impacts of Biodiesel Minimum Content Requirements on Production Capacity and Feedstocks.....7
- Appendix A: Summary of Calls to Minnesota Diesel Help Line9
- Appendix B: Price and Production Data 13
- Appendix C: 2024 Waivers..... 15
- Appendix D: Estimated Minnesota Diesel Consumption and Production Trends..... 15

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

Diesel basics

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.

What is “biodiesel”

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 petroleum 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

Biodiesel in Minnesota is produced from soybeans, corn, and recycled fats, oils, and greases. Biodiesel production adds value to all these commodities. In general practice, biodiesel is blended with diesel fuel.

Minnesota has a minimum content requirement for all No. 2 diesel fuel (see item number 1, “Classes of diesel fuel” under Technical Notes at the end of this report) sold or offered for sale in the state. No. 2 diesel fuels sold in Minnesota are required to have a minimum biodiesel content of 20% (a biodiesel blend known as “B20”) during the warm-weather months of April through September.

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 (A. Pradhan et al. *Energy Life-Cycle Assessment of Soybean Biodiesel Revisited*. Transactions of the American Society of Agricultural and Biological Engineers (ASABE), Vol. 54(3), pages 1031-1039.) 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 over the fuels’ production and use lifecycle.

Performance of biodiesel in vehicles

First implemented in Minnesota in 2009, B5 has been used in winter months and 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. The B20 blending requirement 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. 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

A privately-operated service, the Minnesota Diesel Helpline (800-929-3437 or info@megcorpmin.com), is 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 the root cause, and, when possible, are traced to a specific fueling source.

A summary of calls to the Minnesota Diesel Help Line can be found in [Appendix A](#).

The Minnesota Department of Agriculture (MDA) publishes the [Minnesota B20 Handling Guide \(PDF\)](#), a booklet providing useful information for retailers getting ready for both the B20 and winter biodiesel blend seasons.

The Biodiesel Task Force

The 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.

The [Biodiesel Task Force members](#) are appointed by the commissioner of agriculture. Current membership was appointed in May 2024 and expires June 30, 2026. Task force members apply through the Minnesota Secretary of State’s Open Appointments process.

Economic, health, and environmental benefits of biodiesel

The MDA’s 2017 study, [Economic Impact of the Minnesota Biodiesel Industry \(PDF\)](#), 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 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, since it is a replacement for a fossil fuel (for more information, see the [U.S. Department of Energy Alternative Fuel Data Center](#)).

Implementation of the Biodiesel Minimum Content Requirement

Minnesota was the first state in the U.S. to require the use of biodiesel in 2002 (implemented in 2005), followed by Washington in 2006. Currently, 18 states have mandates for biodiesel blends (mandates include renewable fuel standards (RFS), clean heat standards, and state-owned vehicle requirements. 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, with implementation occurring in 2009 (B5), 2014 (B10), and 2018 (B20), respectively.

B10 and B20 minimum content requirements

The Biodiesel Use Mandate (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 MDA, the Minnesota Department of Commerce (Commerce), and the Minnesota Pollution Control Agency (MPCA) 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 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. 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” 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, 2018.

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

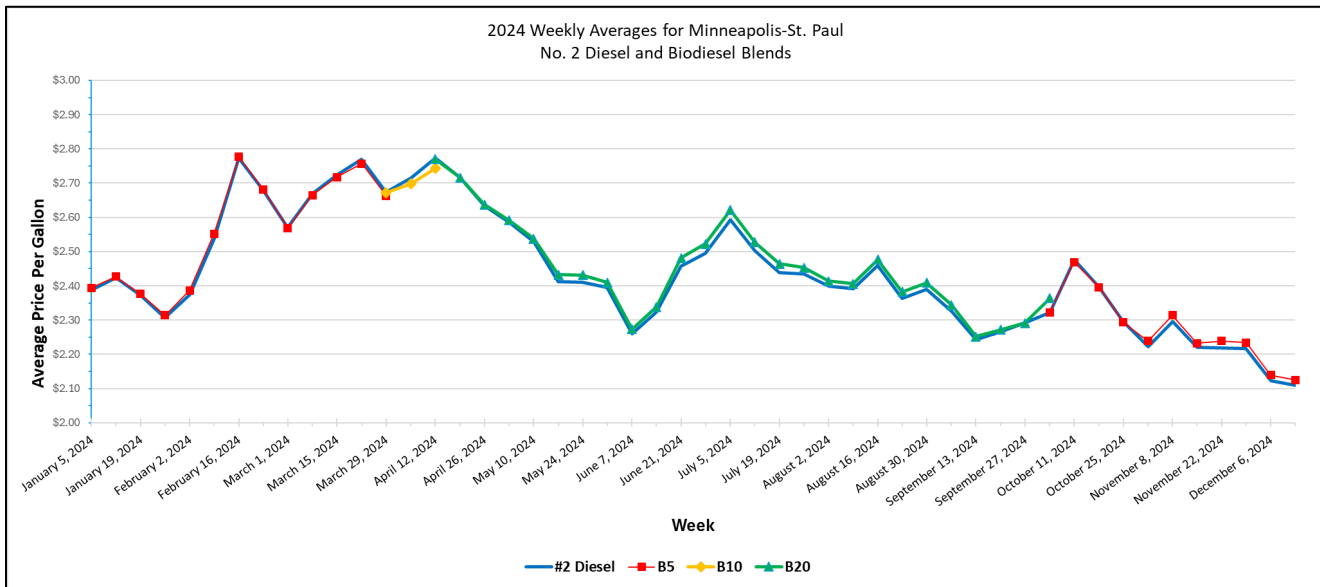
In addition to market forces, the price of diesel fuel offered for sale in Minnesota is affected by factors including the price of components (petroleum diesel and biodiesel), and state and federal policies. Most important among federal policies are the Renewable Fuel Standard and the Biodiesel Blenders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

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

Price

The MDA subscribes to weekly reports on oil prices (prepared by the Oil Price Information Service using AXXIS software). Figure 1 shows “rack prices” of unblended No. 2 diesel fuel and average prices of biodiesel blends at Minneapolis-St. Paul terminals (see [Appendix B](#) for data table). The prices of diesel fuel and biodiesel blends track closely.

Figure 1. No 2 diesel and biodiesel blend (B5, B10, and B20) weekly average rack prices for Minneapolis-St. Paul (Source: Oil Price Information Service). 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 (EIA). The EIA previously reported monthly production by Petroleum Administration for Defense District (PADD). Minnesota is included in PADD2 (Midwest). Beginning January 2021, the EIA Monthly Biodiesel Production Report contains total national biodiesel operable production capacity. Previous Biodiesel legislative reports have included PADD2 biodiesel production data, however that data is no longer available. Figure 2 shows the monthly national biodiesel production trend from 2021 to 2024 (see [Appendix B](#) for data table).

The nameplate capacity that the three Minnesota biodiesel plants were constructed to originally produce was 63 million gallons per year (mgy). Expansion and efficiency improvements in recent years have allowed the plants to increase production levels. The current capacity recognized by the [U.S. Energy Information](#) totals 85 mgy, which has not considered the recent closure of Ever Cat Fuels’ production facility. Table 1 shows the most recent information of these capacities by plant.

On October 31, 2024, Ever Cat Fuels announced ceasing its production activities, citing factors for the decision to include poor market conditions, lack of reliable feedstock supply, and inconsistent government support, specifically the U.S. Environmental Protection Agency’s decision to include petroleum produced renewable diesel in the same renewable identification number (RIN) category as biodiesel. Prior to ceasing activities, Ever Cat Fuels’ production facility had a nameplate capacity of 3 mgy and used a high temperature, high pressure catalytic transesterification process, and used alternative feedstocks, such as recycled oils.

Figure 2. National biodiesel (B100) production, January 2021 through September 2024 (in millions of gallons) (Source: U.S. Energy Information Agency). Trendline shows downward trend in production.

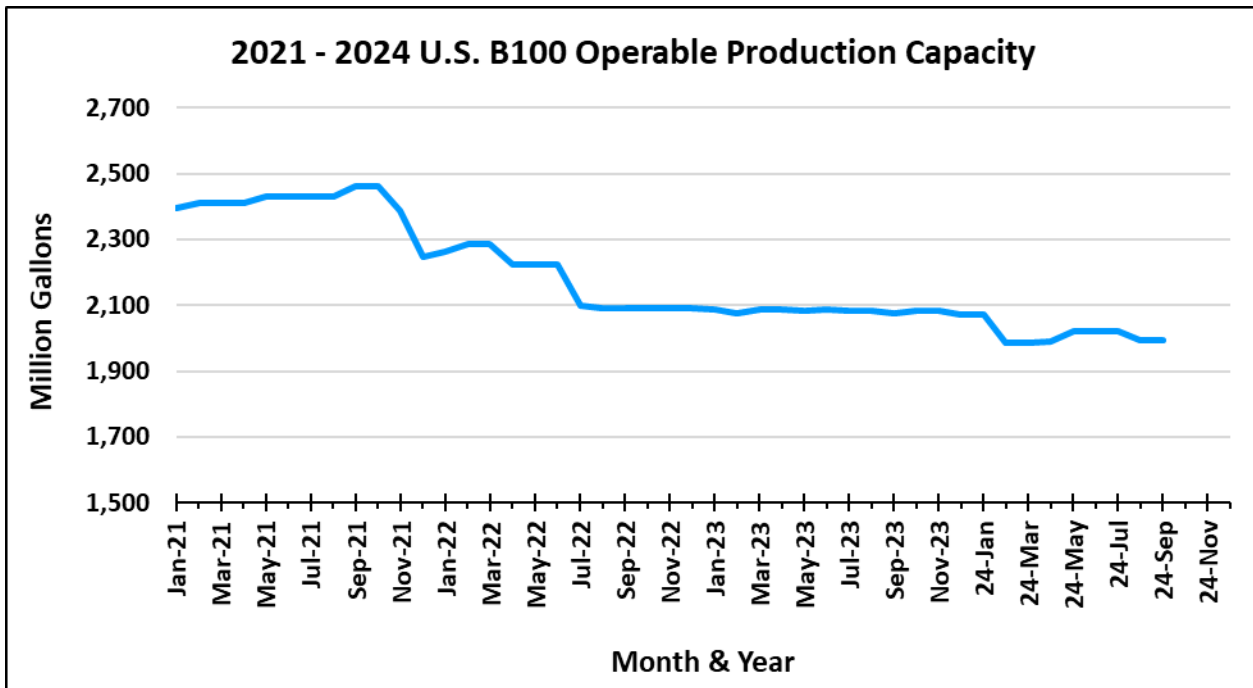


Table 1. Current Minnesota biodiesel plant production capacities.

Plant — Location	Production Capacity (mgy)
Minnesota Soybean Processors — Brewster	36
Chevron Renewable Energy Group — Albert Lea	46
Total	82

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 Processors is a full-crush soybean processing facility and uses soybean oil exclusively for its biodiesel production. Chevron Renewable Energy Group upgraded its plant to process a wide variety of oil feedstocks and in recent years, 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 distributors, 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 Commerce department should there be a period of biodiesel fuel shortage or a problem with biodiesel quality.

Under this waiver authority (MINN. STAT. 239.77, subdivision 2b), Commerce's Weights & Measures Division granted a total of four waivers during 2024. A list of all biodiesel waivers in 2024 is included in [Appendix C](#). The number of waivers reported between 2023 and 2024 were equal, in which both years reported only four waivers.

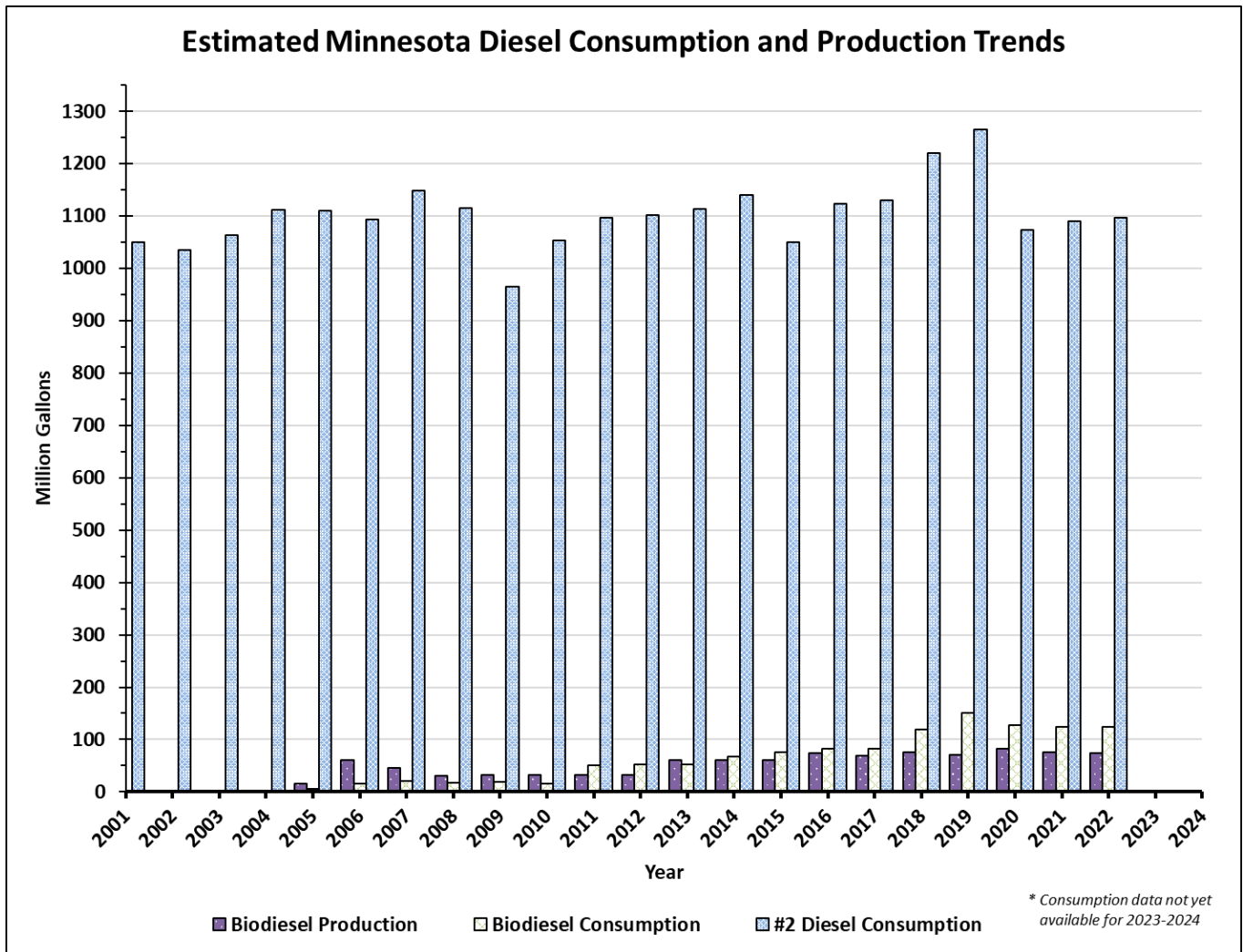
Impacts of Biodiesel Minimum Content Requirements on Production Capacity and Feedstocks

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.

Current production capacity and feedstock trends:

- Biodiesel production has increased from the amount represented by the initial B2 minimum content requirement in 2005 from 16 million gallons per year (mgy) to 74.6 mgy in 2022.
- Biodiesel produced in 2022 within Minnesota was made from diverse feedstocks: soybeans accounted for 45% of biodiesel feedstock, while other oils, fats, and greases comprised the remaining 55% of the feedstock.
- Over the 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. Biodiesel production in Minnesota during 2022 was 74.6 mgy (nearly 5% of the nation's total biodiesel output), representing 59.8% of Minnesota's biodiesel consumption and demand (Figure 3 – see [Appendix D](#) for data table).
- Biodiesel consumption in Minnesota during 2022 was 124 mgy, representing 11.4% of the nearly 1.1 billion gallons per year of the total diesel consumption within Minnesota. According to the U.S. Energy Information Agency, Minnesota is among the top 5 biodiesel consuming states with around 300 public-access fueling stations, ranking third highest after Illinois and Iowa.
- As of December 2024, nameplate production capacity within Minnesota is estimated to be 82 mgy with two biodiesel producers in the state, making Minnesota the eighth largest producer in the nation.

Figure 3. No 2 diesel and biodiesel consumption and production trends 2001-2024 within Minnesota (in millions of gallons) (Source: U.S. Energy Information Agency).



Appendix A: Summary of Calls to Minnesota Diesel Help Line

Date: December 16, 2024
To: Paul Beamer, Minnesota Department of Agriculture
From: Lisa Pedderson, MEG Corp
Re: Minnesota Diesel Helpline 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 diesel or biodiesel question or issue.

Questions received by the Helpline typically include questions regarding specific requirements of the mandate (blend requirements, clarifications on exemptions), vehicle compatibility and warranties, guidance for blending transitions in spring and fall, fuel specifications, availability, and storage and handling tips.

Following is a summary of the issues handled by the Minnesota Diesel Helpline for the period of January 1 – December 16, 2024 as determined by testing and analysis of fuel and filter samples:

No problem with fuel	54%
High water	30%
Oxidation	11%
Fuel not blended for winter	3%
Other	3%
Sediment	0%
Could not be determined with sample provided	0%
Biodiesel contaminants	0%
Microbial (without the presence of water)	0%

Of the many issues the Helpline did troubleshoot, 54% 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. In some of these cases, “filter plugging” was noted when the fuel sample was submitted, but the filter was not provided for testing. We recommend providing filters for testing when filter plugging occurs.

“Other” consisted of a variety of issues including contamination with Diesel Exhaust Fluid (DEF), presence of Drag Reducing Agents (DRA), and use of cellulose media filter/small micron size filter.

Most of the issues submitted 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@megcorpnmn.com.

MEG Corp
13800 24th Ave N, Suite 300 Plymouth, MN 55441 (952) 473-0044

Appendix B: Price and Production Data

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

Week Ending	#2 Diesel (\$USD)	B5 (\$USD)	B10 (\$USD)	B20 (\$USD)
1/5/2024	2.387	2.394	--	--
1/12/2024	2.423	2.427	--	--
1/19/2024	2.372	2.376	--	--
1/26/2024	2.308	2.314	--	--
2/2/2024	2.374	2.386	--	--
2/9/2024	2.537	2.552	--	--
2/16/2024	2.773	2.777	--	--
2/23/2024	2.680	2.680	--	--
3/1/2024	2.569	2.569	--	--
3/8/2024	2.669	2.665	--	--
3/15/2024	2.725	2.718	--	--
3/22/2024	2.770	2.756	--	--
3/29/2024	2.673	2.663	2.672	--
4/5/2024	2.714	--	2.698	--
4/12/2024	2.773	--	2.743	2.770
4/19/2024	2.718	--	--	2.717
4/26/2024	2.634	--	--	2.638
5/3/2024	2.586	--	--	2.591
5/10/2024	2.529	--	--	2.538
5/17/2024	2.412	--	--	2.432
5/24/2024	2.411	--	--	2.432
5/31/2024	2.395	--	--	2.410
6/7/2024	2.260	--	--	2.273
6/14/2024	2.323	--	--	2.338
6/21/2024	2.457	--	--	2.482
6/28/2024	2.495	--	--	2.523
7/5/2024	2.593	--	--	2.622
7/12/2024	2.503	--	--	2.528
7/19/2024	2.439	--	--	2.465
7/26/2024	2.434	--	--	2.453
8/2/2024	2.400	--	--	2.414
8/9/2024	2.391	--	--	2.406
8/16/2024	2.459	--	--	2.477
8/23/2024	2.363	--	--	2.383
8/30/2024	2.390	--	--	2.409
9/6/2024	2.326	--	--	2.344
9/13/2024	2.243	--	--	2.252
9/20/2024	2.266	--	--	2.271
9/27/2024	2.292	--	--	2.291
10/4/2024	2.323	2.322	--	2.363

Week Ending	#2 Diesel (\$USD)	B5 (\$USD)	B10 (\$USD)	B20 (\$USD)
10/11/2024	2.477	2.469	--	--
10/18/2024	2.398	2.396	--	--
10/25/2024	2.295	2.293	--	--
11/1/2024	2.222	2.239	--	--
11/8/2024	2.296	2.314	--	--
11/15/2024	2.221	2.232	--	--
11/22/2024	2.219	2.238	--	--
11/29/2024	2.216	2.234	--	--
12/6/2024	2.123	2.139	--	--
12/13/2024	1.109	2.125	--	--

Table 3. National biodiesel (B100) production, January 2022 through September 2024 (in millions of gallons) (Source: U.S. Energy Information Agency).

Month-Year	B100 Production (million gallons)
January-22	2,263
February-22	2,285
March-22	2,284
April-22	2,225
May-22	2,223
June-22	2,223
July-22	2,097
August-22	2,092
September-22	2,092
October-22	2,092
November-22	2,092
December-22	2,090
January-23	2,086
February-23	2,074
March-23	2,087
April-23	2,087
May-23	2,082
June-23	2,086
July-23	2,084
August-23	2,084
September-23	2,074
October-23	2,083
November-23	2,083
December-23	2,073
January-24	2,073
February-24	1,984
March-24	1,984
April-24	1,991
May-24	2,022
June-24	2,022
July-24	2,022
August-24	1995
September-24	1995

Appendix C: 2024 Waivers

Table 4. Waivers of the biodiesel requirement as reported by the Minnesota Department of Commerce, Weights & Measures Division.

Reason	Mandate Level	Begin Outage	Duration (hours)	Duration (days)
Unplanned Maintenance	B5	1/14/2024 10:30	49:30:00	2.06
Unplanned Maintenance	B5	1/15/2024 8:00	169:00:00	7.04
Supply Constraint	B20	6/6/2024 12:00	6:30:00	0.27
Unplanned Maintenance	B20	6/28/2024 1:00	11:30:00	0.48

Appendix D: Estimated Minnesota Diesel Consumption and Production Trends

Table 5. No 2 diesel and biodiesel consumption and production trends 2001-2024 within Minnesota (in millions of gallons) (Source: U.S. Energy Information Agency).

Year	Biodiesel Production in Million Gallons	Biodiesel Consumption in Million Gallons	#2 Diesel Consumption in Million Gallons
2001	0	0.588	1,050
2002	0	0.966	1,035
2003	0	0.798	1,064
2004	0.294	1.554	1,111
2005	16.002	5.25	1,110
2006	60.018	15.078	1,093
2007	44.982	20.454	1,148
2008	29.988	17.556	1,116
2009	33.012	18.606	965
2010	33.012	15.036	1,054
2011	33.012	51.198	1,097
2012	33.012	52.038	1,102
2013	60.018	52.416	1,114
2014	60.018	67.074	1,140
2015	60.018	74.928	1,050
2016	74.004	81.816	1,124
2017	69.468	82.278	1,130
2018	75.558	119.112	1,220
2019	71.064	150.78	1,265
2020	82.866	128.142	1,073
2021	76.314	124.698	1,089
2022	74.592	124.698	1,096
2023	not yet available	not yet available	not yet available
2024	not yet available	not yet available	not yet available