Bioenergy Update - 2/2/26

Diesel Fuels

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February 2, 2026

Introduction[1]

Ethanol is not the only source of an alternative petroleum fuel with a biological origin. Both biodiesel and Renewable diesel have biological origins and help supplement or replace petroleum diesel fuel. However, biodiesel and renewable diesel are distinct products and produced differently. Understanding the differences between these two diesel fuels is important for farmers and policy makers to make informed decisions about tractor selection, energy consumption, and the potential reduction in diesel fuel made from crude oil. This article provides an overview of the current state of bioenergy diesel fuel.

How are biodiesel and renewable diesel used

Although both biodiesel and renewable diesel have biological origins, the fuels differ greatly in how they are used and their compatibility with existing diesel engines. Biodiesel, the older technology, is commonly blended with petroleum diesel and seldom used alone. This use is similar to how ethanol is combined with gasoline. Biodiesel is often blended with petroleum diesel at rates up to 20% biodiesel and 80% petroleum diesel and sold as B20 diesel. B20 diesel can often be used in diesel engines without any engine modifications. However, biodiesel is a less advanced product as it is just chemically modified vegetable oil.

Renewable diesel is a refinery-grade fuel that is almost identical to petroleum diesel. Renewable diesel does not have to be blended with conventional diesel fuel. From the engine's perspective, renewable diesel "looks like" petroleum diesel. However, because it is a refinery-grade fuel, producing renewable diesel is more complicated than renewable diesel. Based on the following figures, the future of bioenergy diesel is with renewable diesel.

Discussion

Figure 1 presents a visual representation of physical production levels (in million barrels per day). The red line represents biodiesel while the blue line represents renewable diesel. This figure is from 2000 to 2029, accompanied by a two-year EIA forecast extending to the right end of the graph.

Biodiesel emerges as the first product, making its appearance in the early 2000s. Its production steadily increases throughout the late 2000s and early 2010s, but then experiences fluctuations around a relatively stable range, failing to show a consistent upward trend. In contrast, renewable diesel remains virtually nonexistent until the 2010s, when it begins to experience rapid growth. Over the past few years, renewable diesel has witnessed a significant surge in production, while biodiesel's output has continued to decline.

In the most recent historical period and the forecasted timeframe, renewable diesel emerges as the primary driver of growth. While the overall production of both biodiesel and renewable diesel increases, there is a noticeable shift in their composition. Renewable diesel's share of the total advanced bio-diesel-type production rises and eventually surpasses biodiesel's share, ultimately dominating the growth trajectory within the forecasted window.

Figure 2 mirrors Figure 1 but for consumption, not production, again in million barrels per day over 2000 – 2029. The pattern is similar: biodiesel consumption grows first and stabilizes at a moderate level; renewable diesel consumption remains negligible until the 2010s and then accelerates, especially in the 2020s. Since the early 2020's, renewable diesel consumption has exceeded biodiesel consumption and accounts for an increasing share of total bio - diesel use.

Because this chart is consumption, not production, you also see some recent flattening and short - run dips that line up with the period where imports/credit changes have affected usage, followed by a modest recovery in the EIA forecast.The big picture is that renewable diesel is expected to keep expanding its role in the diesel market, both in absolute volumes and relative to biodiesel.

Figure 3 shows the importance of the combination of renewable diesel and biodiesel to the overall diesel market. Currently these biologic diesels account for 10% of the total diesel market. Oil prices will likely dictate how quickly renewable diesel grows.

A future article will discuss oil production and refinery capacity in the U.S. However, refining capacity continues to decline in the U.S. for petroleum which implies alternative petroleum products will continue to increase.

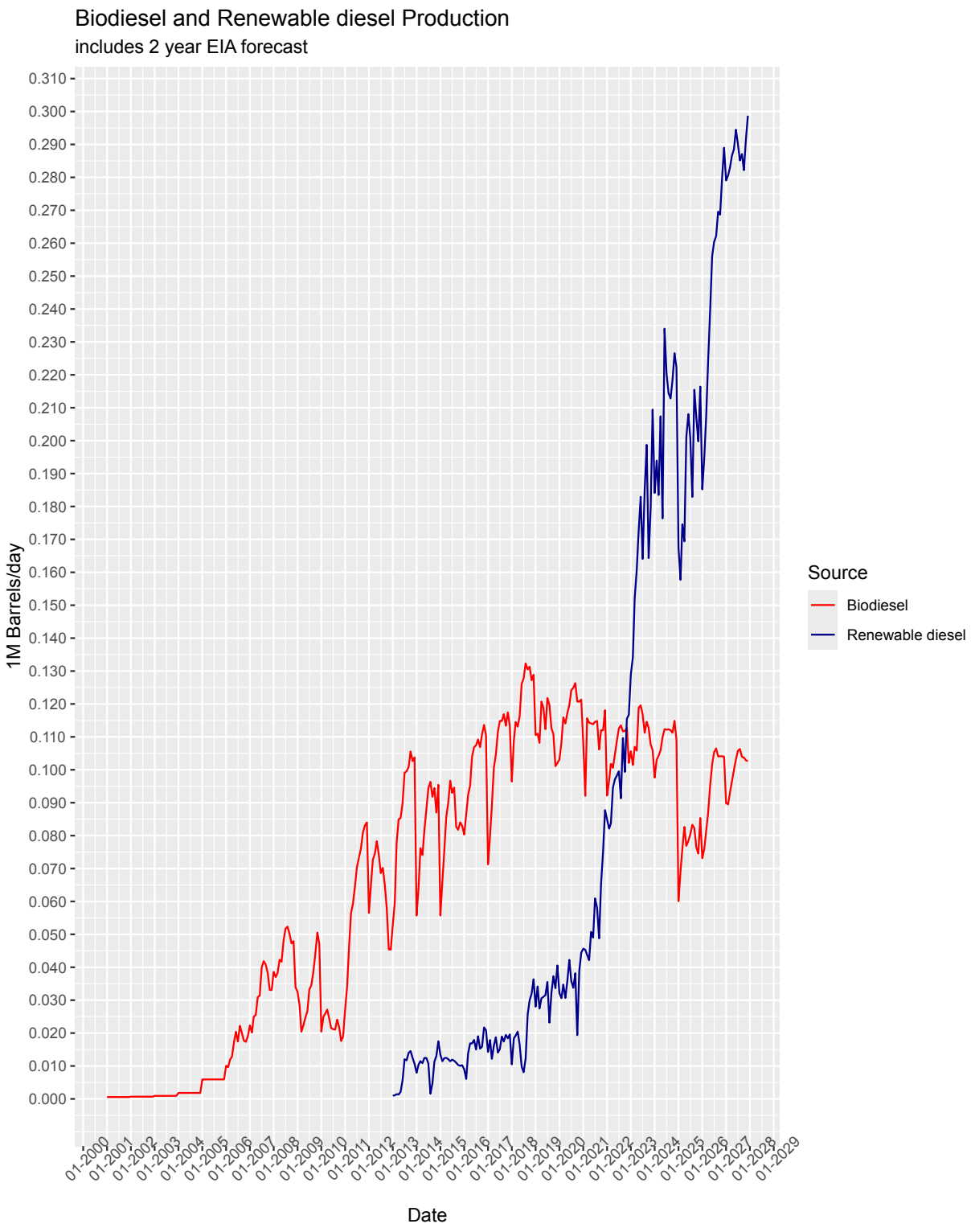

Figure 1. Biodiesel and Renewable Diesel Production

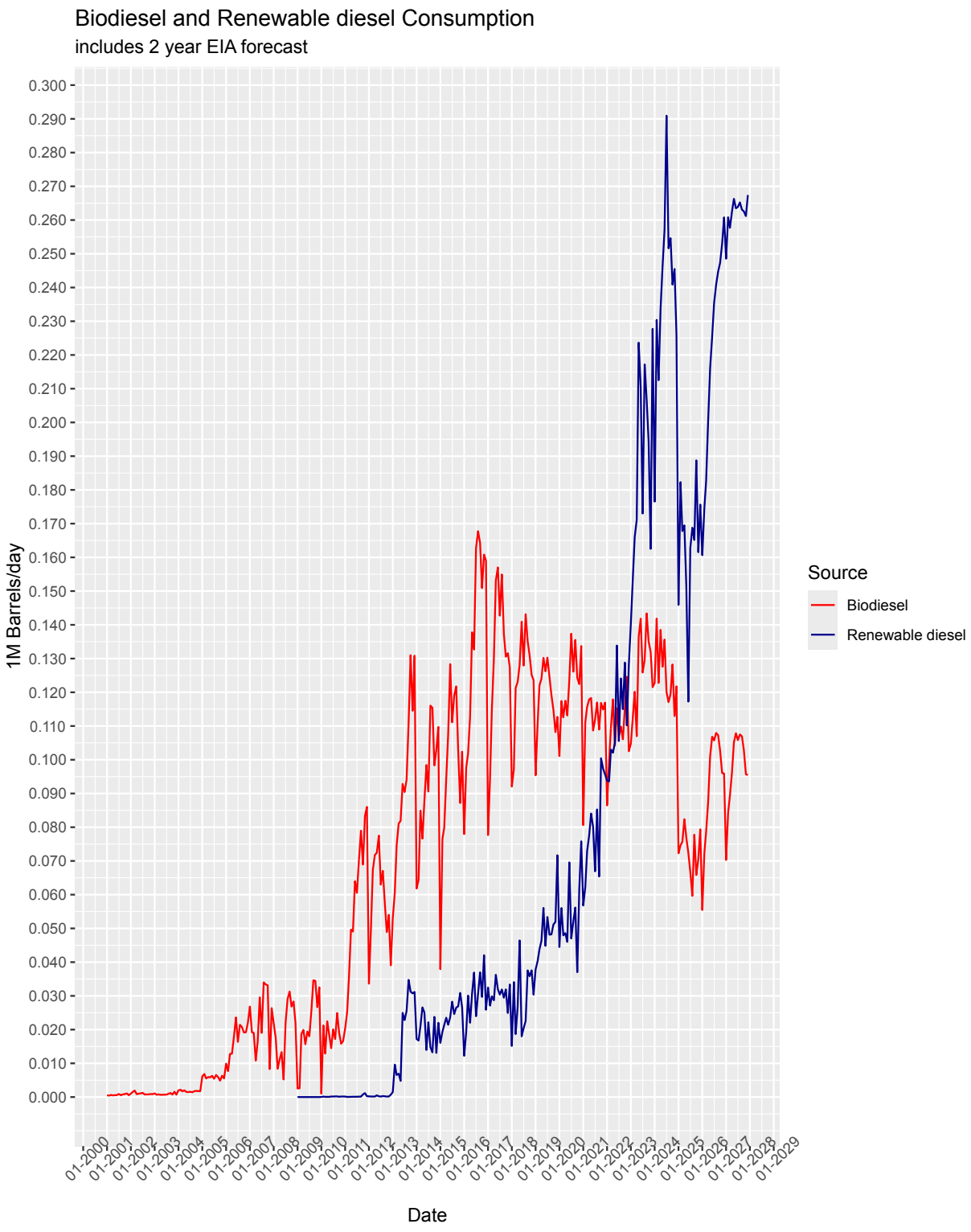

Figure 2. Biodiesel and Renewable Diesel Consumption

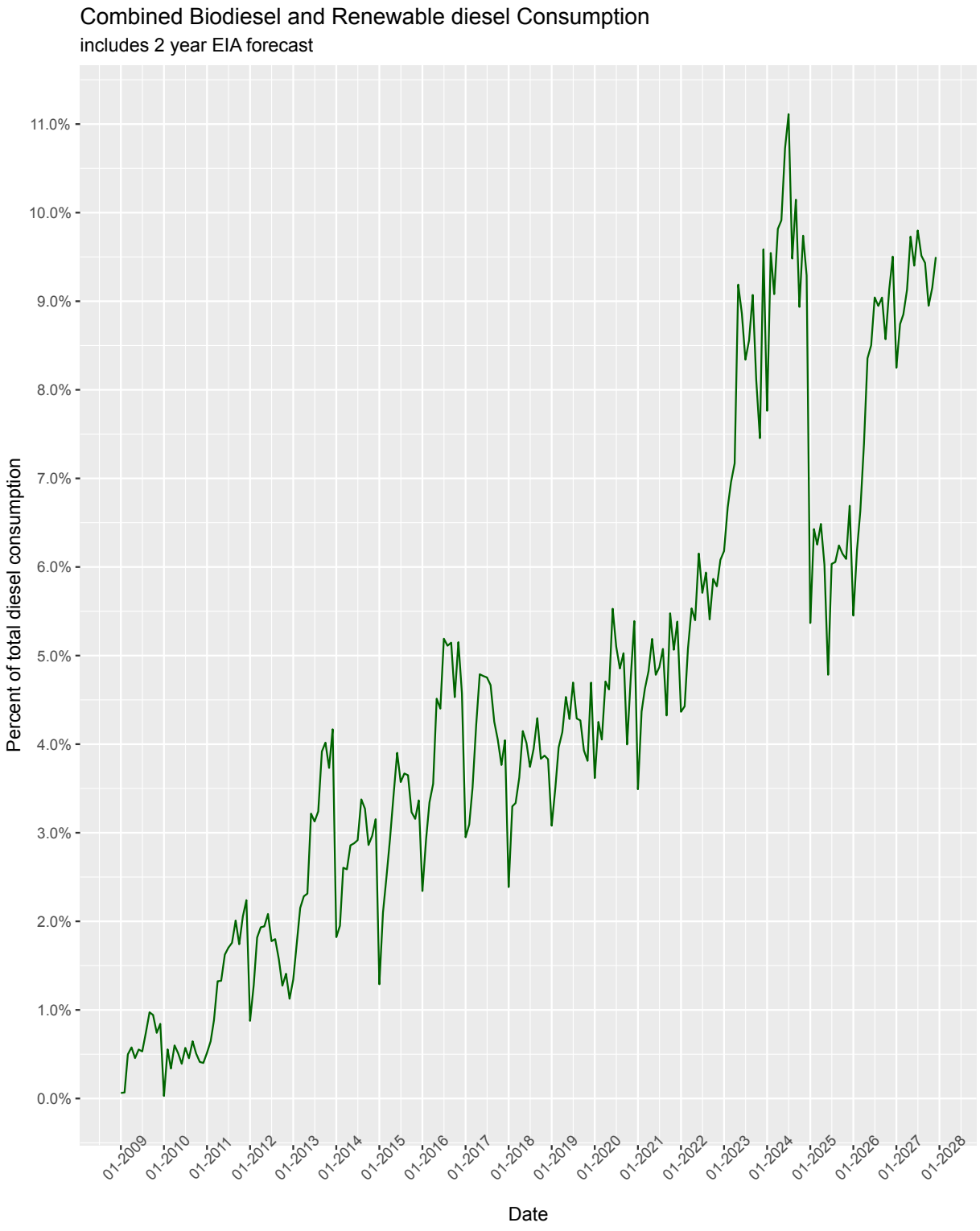

Figure 3. Combined Biodiesel and Renewable Diesel Consumption as a Percent of Total Diesel Use

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