



# Biodiesel in Missouri

## Executive Summary

Biodiesel is a renewable, biodegradable fuel manufactured from vegetable oils, animal fats, or recycled restaurant grease. More than half of the nation's biodiesel production capacity is in the Midwest, led by states such as Iowa, Missouri, and Illinois. [HB 1875](#) and [SB 805](#) authorize tax credits for Missouri producers and retailers of biodiesel fuel, starting in January 2023 and expiring in December 2028.

## Highlights

- Biodiesel burns cleaner than petroleum-based diesel fuel and enhances oil independence and the local economy.
  - A technical disadvantage of biodiesel blends is fuel freezing in cold weather.
- Missouri has the third-largest biodiesel production capacity in the nation, producing 253 million gallons annually at nine biodiesel plants.
  - There are two fueling stations for biodiesel B20 and above in Missouri.

## Limitations

- The exact impact to the environment is yet to be determined, since changes to land use patterns may increase greenhouse gas emissions, pressure on water resources, and air or water pollution.
- Because of the resource competition between growing crops for consumption versus growing crops for alternative fuel sources, food costs may increase. However, it is difficult to determine the exact impact of biofuels on food prices.

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## Research Background

### Definitions

Unlike other renewable energy sources, biomass can be converted directly into liquid fuels, called "biofuels". The two most common biofuels used today are ethanol and biodiesel.

Biodiesel is made from domestically produced renewable fats and oils such as soybean oil, grease, algae, canola, etc. and burns substantially cleaner than petroleum-based diesel fuel, since it reduces air pollution/greenhouse gas levels compared to non-renewable/fossil fuel sources of energy.<sup>1,2</sup> Increasing the availability and use of biodiesel can improve the environment, and reduce dependence on foreign oil and fossil fuel reserves while providing value-added markets for agricultural products.<sup>1-3</sup> It can be used in compression-ignition (diesel) engines with little or no modifications.<sup>4</sup> Biodiesel is simple to use, biodegradable, nontoxic, and essentially free of

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sulfur and aromatics.<sup>1,2</sup>

### Biodiesel blends

Pure biodiesel (B100) contains no petroleum, but it is rarely used in its pure form. It is typically blended with diesel and labeled based on the amount of diesel it is mixed with; for example, a B20 means a biodiesel blend contains more than 5% and no more than 20% biodiesel by volume. Biodiesel is the most "regular" diesel currently sold at gas stations in the U.S. at blends of up to 5%.

### **Energy and Environmental Considerations**

One technical advantage of biodiesel is that it is a cleaner and more renewable source of energy since it reduces exhaust emissions; minimizes black smoke, odor, greenhouse gases (GHG), air toxins and particulates; and does not contribute to sulfur dioxide emissions (acid rain).<sup>1</sup> Some of the technical disadvantages of biodiesel blends are fuel freezing in cold weather, reduced energy density, and degradation of fuel under storage for prolonged periods.<sup>5</sup>

In contrast to fossil fuels, which are exhaustible resources, biofuels are produced from renewable feedstocks. Thus, their production and use could, in theory, be sustained indefinitely.<sup>1</sup> Moreover, replacing fossil fuels with biofuels helps mitigate the undesirable aspects of fossil fuel production and use, including conventional and GHG pollutant emissions, exhaustible resource depletion, and dependence on potentially unstable foreign suppliers.<sup>5</sup>

### **Economic Considerations**

Economic studies on the production of biodiesel suggest that the main economic performance considerations have been capital cost, manufacturing cost, and biodiesel break-even price.<sup>5</sup> The economic performance of a biodiesel plant can be determined once certain factors such as plant capacity, process technology, raw material cost, and chemical costs are determined.<sup>6</sup>

Additionally, biofuels currently tend to require subsidies and other market interventions to compete economically with fossil fuels, which creates deadweight losses in the economy.<sup>7</sup> This can result in inefficient allocation of resources, since the supply and demand of fueling options would not be established based on quantities at market equilibrium. Therefore, biofuels can impact crop prices, although the range of that impact is hard to determine precisely.<sup>7</sup> Finally, although higher crop prices lead to higher food prices, the impacts on retail food in the U.S. are expected to be small.<sup>8</sup>

Legislation filed in Missouri in 2022 ([HB 1875](#) & [SB 805](#)) would authorize credits for a biodiesel retail sale tax credit in the amount of two cents/gallon for biodiesel blends of between 5-10%, and five cents/gallon for biodiesel blends higher than 10%. The bills also authorize biodiesel production tax credits for entities that began construction or started selling biodiesel fuel on or before August 28, 2022, and are at least 51% owned by agricultural producers who are residents of the state, or source at least 80% of its feedstock from within the state.

## Biodiesel in Missouri

Missouri has the third-largest biodiesel production capacity in the nation, with nine biodiesel plants that produce 253 million gallons annually using both soybean oil and animal fats as feedstock (Figure 1).<sup>8</sup>

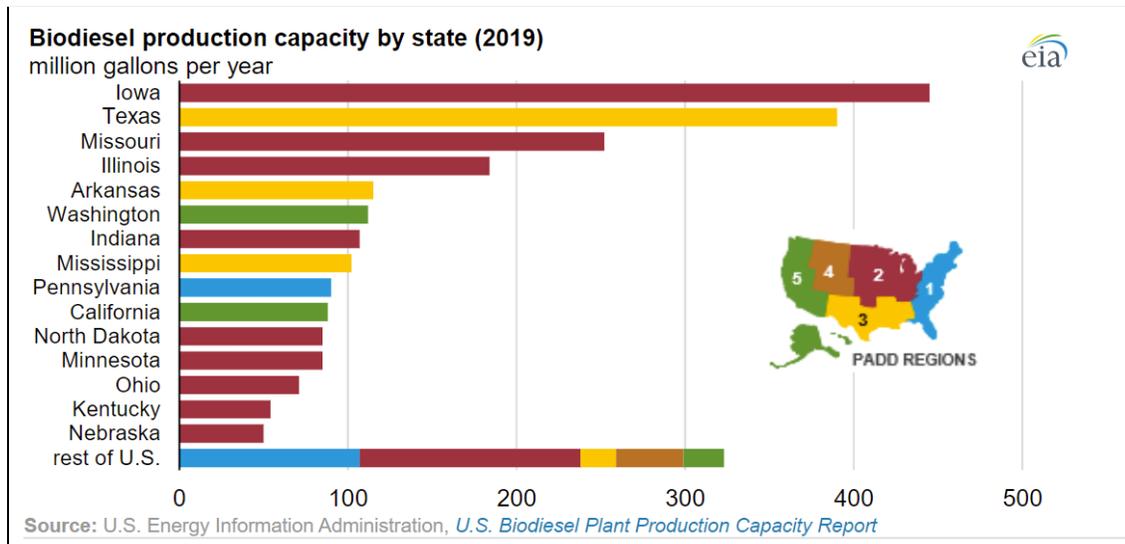


Figure 1. U.S. Biodiesel Plant Production Capacity by state and region.<sup>8</sup>

There are 102 operating biodiesel plants in the nation, with 2.6 billion gal/year in biodiesel production capacity.<sup>8</sup> More than half of the nation's biodiesel production capacity is in the Midwest (PADD 2) region, led by states such as Iowa, Missouri, and Illinois (figure 1).<sup>8</sup> Of the top 15 biodiesel-producing states, nine are located in the Midwest.<sup>8</sup>

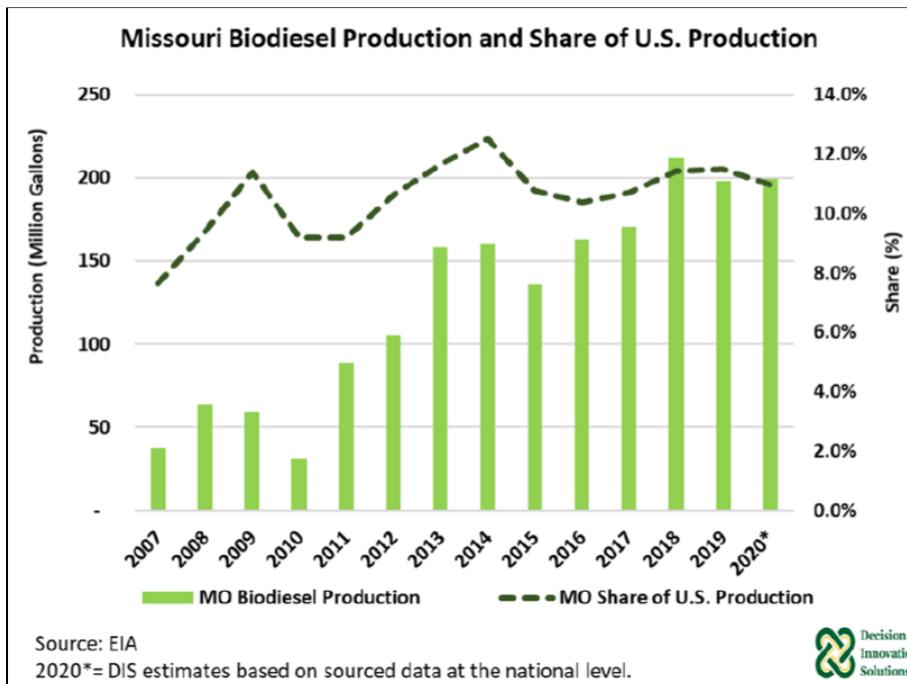


Figure 2. Missouri Biodiesel Production and Share of U.S. Production.<sup>9</sup> This chart shows that overall biodiesel production has increased in Missouri since 2007, but Missouri's share of total U.S. production has remained steady since around 2012.

In 2019 Missouri produced 198 million gallons of biodiesel, representing about 11.5% of total U.S. biodiesel production (1.725 billion gallons). Missouri biodiesel production in 2019 was 5.3 times higher than in 2007 (37 million gallons).<sup>9</sup> The share of Missouri biodiesel production has increased from 7.6% in 2007 to 11.5% in 2019. Biodiesel production in the state has fluctuated throughout this period but overall has followed an increasing trend (see Figure 2).<sup>9</sup>

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