



Renewable Diesel Fuel

Attractive Alternatives to Petroleum Distillate Fuels

Renewable diesel is a hydrocarbon that is chemically equivalent to petroleum diesel. It is a completely interchangeable substitute for conventional petroleum-derived hydrocarbons (gasoline, diesel, and jet fuel), so **renewable diesel can be used as a drop-in biofuel without having to modify the engine's fuel system.**

Renewable diesel is made from biomass, such as soybean oil, using a hydrogenation process that meets the American Society for Testing and Materials (ASTM) specification D975 for petroleum diesel.



Soybean field ready for harvest
(Image: [istockphoto-157193621-170667a](https://www.iStock.com/157193621-170667a))

Is Renewable Diesel the Same as Biodiesel?

No. Biodiesel is produced using a transesterification process, where the feedstock (mainly soybean oil) reacts with an alcohol in the presence of a catalyst like lye.

Biodiesel meets ASTM specification D6751 and is approved for blending with petroleum diesel/distillate. Most U.S. biodiesel is consumed as blends with petroleum diesel in ratios of 2% (B2), 5% (B5), and 20% (B20).

Most petroleum diesel fuel sold in the U.S. contains up to 1% biodiesel because it provides lubrication qualities that can prolong the life of some engine components.

Renewable Diesel Blends

Renewable diesel can be blended with petroleum diesel and/or biodiesel in various ratios. The federal Renewable Fuel Standard requires that non-petroleum-derived diesel fuels, including renewable diesel, must be blended with at least 1% petroleum fuel. Renewable identification numbers (RINs) show compliance with the standard.

Renewable diesel blended with petroleum fuel is labeled with an R followed by the percentage of the renewable diesel content. For example, a blend of:

- 20% renewable diesel and 80% petroleum diesel is called R20.
- 20% biodiesel and 80% renewable diesel is called B20R80 to make a 100% biofuel.
- 20% biodiesel, 20% renewable diesel, and 60% petroleum diesel is called B20R20.

What is R99?

A blend of 99% renewable diesel and 1% petroleum diesel is called R99. R99 diesel can cut CO₂ emissions by 50% or more ([NREL](https://www.nrel.gov/)).

Other advantages noted by R99 users include:

- Lower mechanical costs of operation.
- Less wear of the diesel particulate filter system on modern diesel trucks and fewer regenerations of the system.
- Improved fuel storage stability.

Renewable diesel production

From January 2022 to January 2023, the U.S. capacity for producing renewable diesel and other biofuels increased by 1.25 billion gallons per year—a 71% increase.

This growth in U.S. renewable diesel capacity is driven by rising targets for state and federal renewable fuel programs and biomass-based diesel tax credits.

In January 2023:

- 11 states reported sites with renewable diesel and other biofuels production capacity, up from six states in 2022.
- U.S. production capacity of renewable diesel and other biofuels reached 3 billion gallons per year, surpassing U.S. biodiesel production capacity for the first time.

New & Expanded Renewable Diesel Projects

Renewable diesel projects are coming online in the Pacific Northwest and around the U.S. Because renewable diesel can be co-processed with petroleum diesel, existing petroleum refineries can be converted for renewable diesel production with only modest retrofits

In this local example, the BP Cherry Point refinery near Bellingham, WA, now produces 110 million gallons per year of renewable diesel by co-processing petroleum oil with bio feedstocks to produce renewable diesel.



Cherry Point Refinery (Image: [bp America](#))

Renewable Diesel Delivery and Pricing

Renewable diesel is widely available in the Pacific Northwest via 10,000-gallon bulk deliveries. It can be transported in petroleum pipelines and sold at retail stations with or without blending with petroleum diesel.

Rack prices for all fuel types are available from the [Oil Price Information Service energy prices webpage](#).



Renewable diesel pipeline (Image: [Liquid Energy Pipeline](#))

Renewable Diesel Procurement

Washington has a fuel supply contract (#08721) through the state Dept. of Enterprise Services (DES). Per the [DES Contract Summary](#), suppliers provide fuel to seven geographic regions across the state.

To save on contracting costs, city and county agencies may use interlocal agreements to piggyback onto contracts with the state or other agencies. Currently 1,787 agencies have agreements that allow for the use of this and other state contracts (see [Organizations with current contract usage agreements](#)).

For more information about the state's fuel contract, contact:

DESProcurementConsulting@des.wa.gov.

Resources

- [Biodiesel and Renewable Diesel](#) – U.S. Dept. of Energy (DOE)
- [Biodiesel Fuel Basics](#) – DOE
- [FAQ Renewable Diesel](#) – Star Oilco
- [Today in energy](#) – EIA
- [U.S. Renewable Diesel Fuel and Other Biofuels Plant Production Capacity](#) – EIA



WASHINGTON STATE UNIVERSITY
Energy Program

Updated May 2025. Content developed by [Randy Thorn](#), principal, and [Melinda T. Spencer](#), technical education.

Green Transportation Program
Washington State University
Energy Program
905 Plum Street SE
P.O. Box 43165
Olympia, WA 98504-3165

Copyright © 2024
WSU Energy Program
WSUEEP24-003 • April 2024

Our Mission Statement: *Creating Energy Solutions*

It is the policy of WSU that no person shall be discriminated against in employment or any program or activity on the basis of race; sex/ gender; sexual orientation; gender identity/expression; religion; age; color; creed; national or ethnic origin; physical; mental or sensory disability, including disability requiring the use of a trained service animal; marital status; genetic information and/or status as an honorably discharged veteran or member of the military.