



Key Points: Macro Level:

- Renewable diesel (RD) is a premium “drop-in” replacement for conventional diesel (ULSD); it provides end user fleets with very significant GHG reductions (~65%), without the need to make costly changes to diesel-powered vehicles/equipment or fueling infrastructure.
- The California LCFS program has fundamentally transformed supply and demand dynamics for RD as a growing replacement for ULSD in California’s large (16 billion gpy) diesel market.
- This is because the LCFS program provides lucrative monetization for the GHG-reduction benefits of RD relative to baseline ULSD, as measured by its carbon intensity.
- Using this average CI value for RD and \$190 per LCFS credit, the credit value of RD sold in California would be \$1.58 per gallon; this makes it significantly cheaper than ULSD. However – because RD is more expensive to produce than ULSD – taking away the LCFS credit would make RD about 17% more expensive than ULSD.
- In the prior twelve months, over 560 million gallons of RD were dispensed and consumed in California.
- The two top feedstocks are Used Cooking Oil and Tallow, waste products of other processes that are incentivized in the Clean Fuel Standard by their lower carbon intensities; more than 75 percent of the RD consumed in California today is produced from these two sources.
- With this combination of rapidly increasing RD volumes at a fairly low CI, in mid-2018 RD surpassed ethanol as the top credit generator in the LCFS.
- CARB data indicate more than 500 million RD gallons per year are now being consumed in California. Oregon also attracts RD imports, via adoption of its own LCFS-type program (Oregon Clean Fuels Program). The Oregon DEQ estimates that currently, 10 to 49 million gallons of RD are “available” for use in the state.
- It’s estimated that U.S. RD consumption outside California and Oregon is roughly 2 million gallons per year. Relatively small volumes are being used to support small-scale demonstrations, such as was conducted recently by the New York City Department of Citywide Administrative Services.
- It is much harder to purchase RD in areas outside of California or Oregon. The vast majority of available RD goes to markets like the above two (as well as parts of Canada), that monetize RD’s GHG-reduction qualities. The Port of Seattle is using RD in Port vehicles but is paying a significant premium price over conventional diesel to obtain the lower carbon fuel.
- World Energy, a producer of RD in California, is now expanding capacity by six-fold, largely due to strong LCFS market pull for RD (and sustainable jet fuel, which is co-produced at the plant). Because California strongly favors in-state RD production, the State has provided significant financial support for World Energy’s RD production facility, as well as other existing or planned biofuel production facilities.
- It costs more to produce RD than conventional diesel. Despite the incremental production cost, producers are able to sell RD into California (and Oregon) markets at prices that are at (or below) ULSD. This is due, in part, to LCFS credits, as described above. Large wholesale purchasers such as UPS (described below) are able to get the best prices from local distributors. However, Propel is an example of a retail seller in California that is able to offer RD for a price at parity with ULSD.
- Conversely, outside California and Oregon markets, the price to purchase RD is roughly 50 to 70 percent higher than ULSD. New York City purchased about 900,000 gallons of RD (from REG) for a sanitation truck trial demonstration. The City paid approximately \$1.60 more per gallon for RD, compared to its normal ULSD fuel (blended with up to 20% biodiesel). The Port of Seattle currently pays more than double for RD compared to diesel (\$2.50/gallon compared to \$5.18/gallon).



CASE STUDY: RENEWABLE DIESEL (RD) (cont'd)

Example RD User in California

A broad range of end users from commercial trucking, municipal fleets and transit agencies rely on RD to achieve immediate GHG reductions in their California operations. Examples include:

- United Parcel Systems (UPS) appears to be the largest private fleet using RD in America today. In July 2015, UPS announced that it will buy as much as 46 million gallons of RD over the next three years. UPS has set a goal to displace 12 percent of its petroleum-based fuels with RD in its HDV fleet by 2017. The company has cited three vendors – each currently focused on a different feedstock – from which it intends to purchase this large volume of RD: 1) Neste (tallow), 2) Renewable Energy Group (other oils / fats), and 3) Solazyme (algae-derived oil). UPS has noted that monetizing RD through LCFS and RIN values enables UPS to purchase RD at a price that is “close to parity with conventional petroleum.”
- Since 2015, all City of San Francisco fleet HDVs have used RD, including its 600+ vehicle transit fleet. In April 2018, San Francisco announced that Bay Area ferries, excursion providers and other agencies using water transportation (e.g., San Francisco Fire Department) are also transitioning to RD. Other municipalities in California using RD in their city owned fleets include Oakland, Sacramento and San Diego.
- Ecology – a transportation and logistics company operating in bulk waste, recyclables, heavy-haul and oversize loads and drayage of containers to and from the port of Los Angeles and Long Beach – has switched hundreds of trucks to operate on RD.



“The bad news (about RD) is on the supply side. We can’t get enough of it,” said Carlton Rose, President of Global Fleet Maintenance and Engineering at UPS.

¹California Air Resources Board,
https://ww3.arb.ca.gov/fuels/lcfs/dashboard/quarterlysummary/quarterlysummary_013120.xlsx

²Oregon Department of Environmental Quality, “2019 Fuel Supply Forecast,”
<https://www.oregon.gov/das/OEA/Documents/Clean%20Fuels%20Forecast%202019.pdf>.

³See New York City Department of Citywide Administrative Services,
“DCAS to Expand Use of 99% Petroleum-Free Renewable Diesel in City Vehicles,” <http://www.nyc.gov/html/dcas/downloads/pdf/fleet/Press-Release-DCAS-to-Expand-Use-of-Renewable-Diesel-in-City-Fleet-Vehicles.pdf>.

⁴UPS comments to EPA on draft 2017 RFS rulemaking,
<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100PV0A.pdf>.