



Washington State Department of
Enterprise Services

Biodiesel Use by Washington State Agencies

July through December 2012

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REPORT HIGHLIGHTS

State agencies continued to use significant amounts of biodiesel during the last six months of 2012.

- Total biodiesel purchases by state agencies under state fuel contracts were just more than 425,000 gallons for this period.
- Washington State Ferries (WSF) is the state's largest consumer of diesel fuel. WSF purchased 262,217 gallons of biodiesel, the most ever purchased for a six-month period. Fuel containing five percent biodiesel (B5) continued to be used where in-line blended fuel was available. As a fleet, WSF reached an average of three percent biodiesel for the period, with B5 purchases averaging six cents cheaper than diesel. B5 fueling for the entire fleet is expected to be available in March 2013.
- Biodiesel purchased by state agencies other than WSF totaled 165,257 gallons during this six-month period. Biodiesel made up 10 percent of the diesel fuel purchased by these agencies during this period.
- The Washington State Department of Transportation (WSDOT) is the state's second largest purchaser of diesel fuel. Biodiesel made up more than 16 percent of total diesel fuel purchased in western Washington and more than five percent of total diesel fuel purchased in eastern Washington during this reporting period. The percent of biodiesel for western Washington was down from its 2011 high of 21 percent as WSDOT halted purchases of biodiesel blends above B20 to comply with federal guidelines regarding compatibility of underground storage tanks and fuel dispensers with higher blend biodiesel fuel.
- Testing continued to show no significant fuel quality issues related to biodiesel use by state agencies.

BACKGROUND

As a part of the state's efforts to reduce its dependence on foreign oil, reduce emissions, and stimulate local production and use of biodiesel, 2009 state law mandates state agencies to use biodiesel fuels to operate diesel-powered vessels, vehicles and construction equipment. Currently, the WSF system is to use a minimum of five percent biodiesel in all vessels as long as the price of a B5 biodiesel blend does not exceed the price of diesel by five percent or more. All other state agencies are directed to use a minimum of 20 percent biodiesel by total volume to operate diesel vehicles and construction equipment.

RCW 43.19.642 requires all state agencies using biodiesel fuel to file biannual reports with the Department of Enterprise Services (DES) documenting use of the fuel and a description of how any problems encountered were resolved. DES collaborates with key state agency stakeholders to prepare this report.

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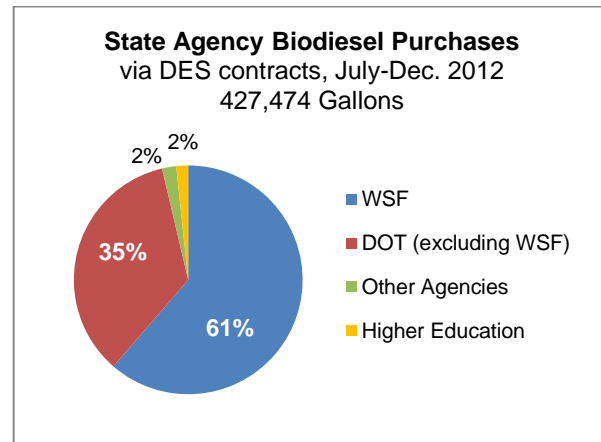
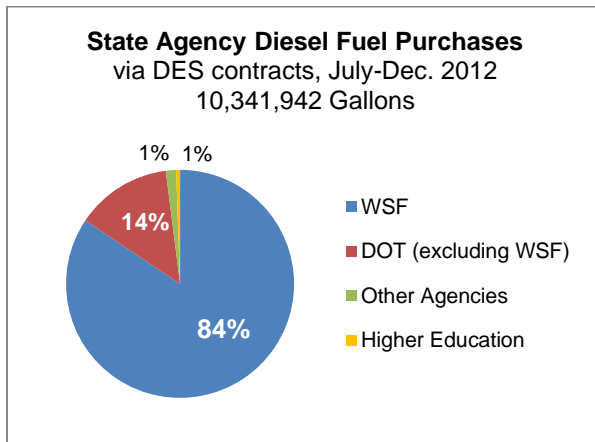
This report covers the period of July 1 through December 31, 2012, and focuses on bulk fuel purchased through state fuel delivery contracts. As used in this report, the term “biodiesel” means pure biodiesel (B100) unless clearly indicated otherwise. Biodiesel blends are specified by the capital letter “B” followed by the value representing the volume percentage of biodiesel, such as B5 and B20.

STATE BIODIESEL PURCHASES

State agencies are required to purchase bulk fuel through the state fuel contracts, which cover gasoline, heating oil, and diesel (including biodiesel). The contracts are also used by many higher education institutions, cities, counties, school districts, and transit systems.

From July 1 through December 31, 2012, state agencies and institutions of higher education purchased 10.3 million gallons of diesel fuel through state fuel contracts. This included a total of 427,474 gallons of biodiesel. Purchases by WSF made up 84 percent of all diesel fuel and 61 percent of the biodiesel purchased during the period. Total biodiesel use by WSF held steady, as a B5 biodiesel blend continued to be the standard for vessels receiving fuel from the two locations with in-line blended biodiesel fuel. Purchases made by state agencies other than WSF for use in diesel-powered vehicles and equipment made up 16 percent of total fuel purchased and 39 percent of the biodiesel purchased on state contracts.

Biodiesel purchases by institutions of higher education are included in the data. Since those educational institutions are not required to use the state fuel contract, this report does not capture all the fuel purchased by higher education institutions during the period.

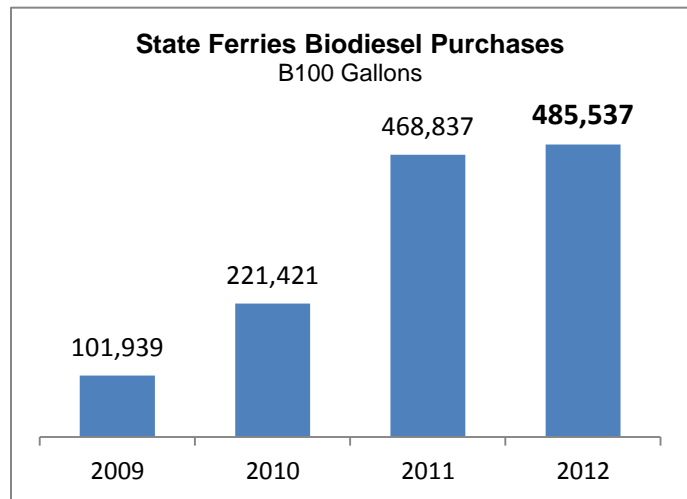


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WASHINGTON STATE FERRIES (WSF) BIODIESEL USE

- WSF purchased 262,217 gallons of biodiesel during this six-month period. This is a 17 percent increase over the 223,320 gallons purchased in the first six months of 2012 and an eight percent increase from the same period in 2011. The increase reflects the greater fuel use during the summer when the Sidney run is in operation, as well as the impact of having all three Kwa-di Tabil class vessels in operation. For the year, biodiesel purchases in 2012 totaled 485,537 gallons, which is three percent above 2011 total purchases.
- WSF continued to use in-line blended B5 for all vessels fueled by truck from the Harbor Island truck facility in Seattle. This facility accounts for about 25 percent of the total fuel used. WSF began using B5 for ferries fueling out of the Harbor Island truck terminal in August 2009.
- WSF also continued to use in-line blended B5 for all vessels fueled by truck from Anacortes. This facility accounts for about 40 percent of the total fuel used. WSF began using B5 for ferries fueling out of Anacortes in January 2011.
- The capital improvement project to build the infrastructure for blending biodiesel at the Seattle fuel pier is undergoing final testing. A 25,000-gallon biodiesel tank has been manufactured and installed along with an in-line blending system on Pier 15. If all goes as planned, ferries fueling at Pier 15 will begin using B5 on March 1, 2013. Once in operation, WSF will have access to in-line blended biodiesel at all three of its fueling locations.
- The average price paid for diesel during the period was \$3.57 per gallon; the average price paid for B5 was \$3.51 per gallon, or six cents less than diesel.
- WSF had no biodiesel-related quality or performance issues during the period.



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Washington State Ferries Biodiesel Use: January 2009 to December 2012

Time Period	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
July - Dec. 2012	8,466,258	262,217	8,728,475	3.0%
Jan. - June 2012	8,283,480	223,320	8,506,800	2.6%
July - Dec. 2011	8,672,324	241,722	8,914,046	2.7%
Jan. - June 2011	8,435,352	227,115	8,662,467	2.6%
July - Dec. 2010	8,455,444	119,242	8,574,686	1.4%
Jan. - June 2010	8,459,772	102,179	8,561,951	1.2%
July - Dec. 2009	8,463,791	71,225	8,535,016	0.8%
Jan. - June 2009	8,269,302	30,714	8,300,016	0.4%

LAND SECTOR USE

State agency purchases of biodiesel for use in vehicles and equipment decreased significantly from 196,933 gallons in the first six months of 2012 to 165,257 gallons in the last six months of 2012. This decrease was due in large part to a 10 percent decrease in total fuel purchased during the period. Also a factor was WSDOT's suspension of purchases of biodiesel blends above B20 in response to federal regulations. On a percentage basis, overall state agency biodiesel purchases declined from 11.1 percent to 10.2 percent of total diesel fuel purchased under the state fuel contract.

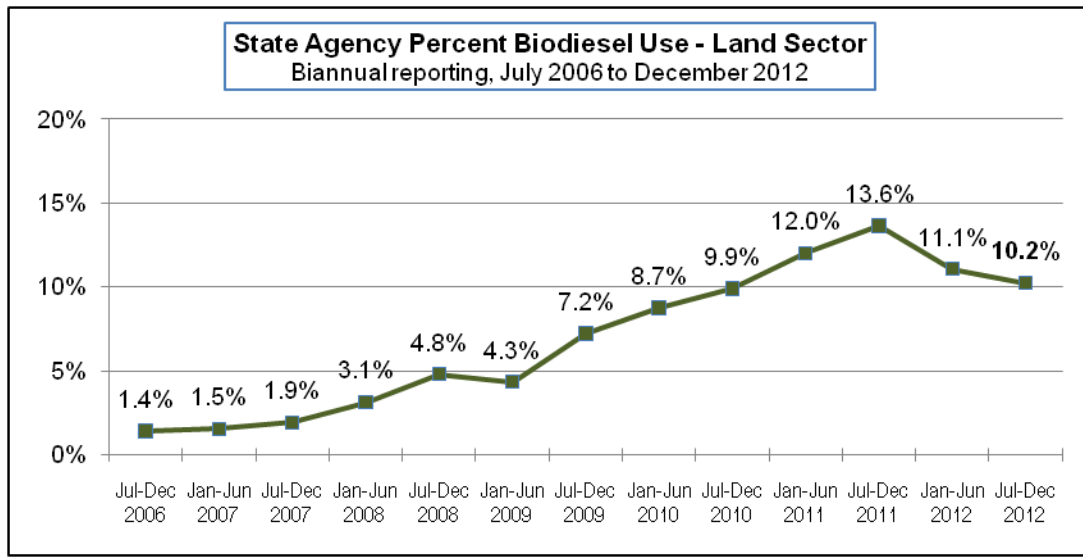
WSDOT is the largest single purchaser of diesel fuel in the land sector. During this reporting period, WSDOT purchased 1.4 million gallons of diesel fuel, accounting for 87 percent of all diesel fuel and 90 percent of all biodiesel purchased by state agencies under the state fuel contract. WSDOT maintains a comprehensive, statewide network of fueling stations that serves the majority of the state's diesel-powered equipment and vehicles. Of the 10 other agencies purchasing diesel fuel under the state contract, only three purchased more than 10,000 gallons of bulk diesel fuel during the period. These included the departments of Corrections, Natural Resources, and Fish & Wildlife. Among the 11 higher education institutions purchasing diesel fuel off the state contract, only the University of Washington purchased more than 10,000 gallons of bulk diesel fuel during the period.

State Agency Biodiesel Purchases (Land Sector): July to December 2012

Agency	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
WSDOT	1,256,632	149,502	1,406,135	10.6%
Other Agencies	141,095	8,555	149,650	5.7%
Higher Education	50,904	7,200	58,104	12.4%
Total	1,448,631	165,257	1,613,888	10.2%

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DETAILS ON WSDOT PURCHASES AND USE

- Overall, WSDOT's total gallons of biodiesel purchased was lower than the previous six months. Biodiesel compared to total diesel volume declined from 12 percent to 11 percent. This decline in percentage was due to the continued suspension of purchases of biodiesel blends higher than B20.
 - In July 2011, EPA published final guidance for underground storage tank (UST) systems storing diesel containing greater than 20 percent biodiesel. Federal regulations (40 CFR 280.32) and biodiesel handling guidelines call for fuel tanks and systems to be made of, or lined with, materials that are compatible with the stored substance.
 - According to the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) Biodiesel Handling and Use Guide, B100 will degrade, soften, or seep through some hoses, gaskets, seals, elastomers, glues, and plastics with prolonged exposure. The guide concludes that biodiesel blends of B20 or less have less of an effect on materials and very low blends of biodiesel have no noticeable effect on materials compatibility.
 - Based on these regulations and guidance, WSDOT suspended the use of biodiesel blends above B20 in May 2012. It has since worked with industry experts to assess its fuel tanks and determined that WSDOT diesel fuel tanks must be replaced to meet certification requirements to store biodiesel blends above B20. Replacement of the tanks, and in turn the resumption of purchases of higher biodiesel blends, is dependent on funding.
- WSDOT's experience with biodiesel fuels and testing of biodiesel blends up to B90 has demonstrated the importance of (1) managing biodiesel concentration based on climate and conditions, (2) greater frequency of tank cleaning and filter replacement, and (3) limiting biodiesel at sites with low fuel turn-over. WSDOT continues to

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evaluate its diesel sites for feasibility of biodiesel use in areas that experience cold winter temperatures and at sites with lower turn-over (no fuel use for periods of four to six months or longer). In addition, WSDOT is working with fuel additive manufacturers to address fuel storage longevity and cold weather operability issues.

- In western Washington, WSDOT has 52 diesel fueling sites, with seven of these identified as sites where biodiesel fuel use is not advised. Of the 45 sites where biodiesel blends were provided, B20 was the standard fuel delivered to 87 percent of the sites. The other sites received deliveries of B20 until November when they switched to B5 or B10 for the cold weather months. For this reporting period, biodiesel averaged 16 percent in western Washington as compared to total diesel volume purchased. This is unchanged from the previous period, but down from the 21 percent the region averaged for all of 2011 when some sites were providing biodiesel blends of up to B40.
- In eastern Washington, WSDOT has 57 diesel fueling sites, with four of these identified as sites where biodiesel fuel use is not advised. During this period, biodiesel was provided at 53 fueling sites. From July through September 2012, 24 sites (45 percent) received B20 and 14 sites (26 percent) received B10, while the remaining 15 diesel sites did not receive deliveries. From October through December 2012, all sites received B5 or less for the cold weather months. Biodiesel averaged 5.4 percent in eastern Washington, down from the 6.6 percent the region averaged the previous six months.

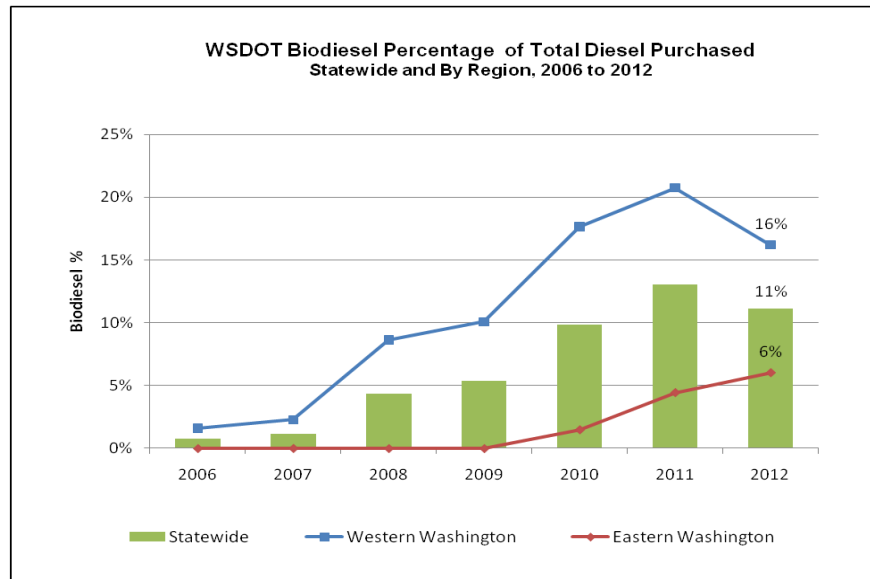
WSDOT Biodiesel Purchases by Region: July 1 to December 30, 2012

Region	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
Westside	562,321	109,704	672,025	16.3%
Eastside	694,311	39,798	734,110	5.4%
Statewide Total	1,256,632	149,502	1,406,135	10.6%

- WSDOT continued to employ best practices for using biodiesel. Operational issues included: (1) replacing fuel dispenser filters at twice the previous rate and (2) using a more porous filter to minimize filter failure. WSDOT continues to experience higher rates of fuel injector and filter failure which may be attributable to biodiesel use.

On a percentage basis, WSDOT biodiesel purchases have significantly increased since 2007, especially in western Washington where biodiesel purchases averaged 21 percent in 2011. The lack of biodiesel availability from contractors serving eastern Washington limited WSDOT's efforts to use biodiesel fuels in that region prior to 2011.

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FUEL QUALITY

Washington State Department of Agriculture (WSDA) continues to monitor the quality of diesel and biodiesel used by state agencies as part of the state's Motor Fuel Quality Program. During this reporting period, WSDA tested 188 diesel and biodiesel fuel samples and submitted 102 to the contract laboratory to test compliance with American Society for Testing and Materials (ASTM) quality standards. Samples were obtained from fuel distributors, biodiesel producers, retail outlets and WSDOT sites.

The program tested 30 samples and collected 25 for laboratory testing at WSDOT fueling locations. Three of the samples did not meet the ASTM Flash Point specification; all three samples were biodiesel blends of B7 or less.

The program evaluated 158 samples from locations other than WSDOT sites and 77 were submitted to the contract laboratory for analysis. Of the laboratory samples, 15 of the 45 diesel samples and 6 of the 32 biodiesel blend fuel samples did not meet one or more ASTM quality specifications, including specifications for Flash Point, Appearance, and Lubricity. Five of the biodiesel blend fuel samples not meeting one or more specifications were B5 fuels; one was a B50. WSDA issued Notices of Correction to all of the locations with fuels that did not meet specifications. In addition, fuel at three locations was removed from sale for excessive water in the storage tanks. WSDA is preparing notices of intent to issue a civil penalty for repeat violators.

While these fuel quality failures do not cause immediate engine problems, WSDA is watchful for any trends and will continue to work with the violators on corrective actions. Overall, WSDA did not identify any significant fuel quality issues during the period. No performance-related issues were reported to WSDA by state agencies.

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STATE CONTRACTING

- The state bulk fuel contract (Contract #00311), which took effect May 21, 2011, continued in its second year with no significant problems to report. The contract covers all regions of the state and encompasses sixteen contracts with five contractors. Provisions of the state bulk fuel contract related to biodiesel include:
 - Biodiesel can be made from any feedstock so long as it meets ASTM specifications.
 - Contractors must provide biodiesel fuel in any percentage from B1 to B100.
 - Contractors must provide state agencies with biodiesel made from at least 51 percent in-state feedstock and/or biodiesel produced in-state.
- To determine compliance with the contract provision to primarily provide in-state sourced biodiesel, DES developed a process that includes a review of invoices or bills of lading that document the date, quantity, and source of biodiesel purchases. DES is working directly with each contractor as it refines this process. So far, data review demonstrates a compliance level above the required 51 percent.
- On August 1, 2012, a new biodiesel fuel product (B5 Rack) was added to the contract with PetroCard, one of the five bulk fuel contractors. B5 has become a standard product available from fuel suppliers in Washington with its own pricing. This change provides a competitively priced product to contract customers. DES plans to work with the other four contractors to make this product available statewide but was delayed for this reporting period.
- In anticipation of the completion of the in-line blending infrastructure at Pier 15, DES and WSF worked during this period to prepare an amendment to the Seattle Harbor fuel dock contract (Contract #01108) to add biodiesel to the contract's core fuel types. The amendment is expected to include fuel quality standards and specifications and the 51 percent in-state sourced biodiesel requirement consistent with the bulk fuel contract (Contract #00311). As of the end of December 2012, negotiations were nearing completion. Fueling with B5 under this contract will increase biodiesel purchases by an estimated 400,000 gallons annually for WSF. There was no activity to report regarding the Marine Refueling Services contract (Contract #02207) this period.
- The state vehicle contracts for 2012/2013 and 2013/2014 models require trucks and vans with diesel engines to be certified to use biodiesel blends of up to B20. No issues related to this contract provision were reported to DES this period.

OTHER ACTIVITIES RELATED TO BIODIESEL USE BY STATE AGENCIES

- **Extent Practicable Rulemaking:** The Washington State Department of Commerce (Commerce) continued preliminary work in the rulemaking process to establish standards and guidelines for agency use of biofuels and vehicle electrification "to the extent practicable." The rule is to define practicability and clarify how state agencies

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will be evaluated in determining whether they have met mandated goals, which include 40 percent biofuel/electricity use by June 1, 2013 and 100 percent biofuel/electricity use by June 1, 2015.

An interagency work group – which includes the Washington State University Extension Energy program and the state departments of Transportation, Agriculture, Ecology and Enterprise Services – is providing guidance to Commerce as it works to draft the rule. A public workshop to gather stakeholder suggestions and a public hearing on the proposed rule was held in April 2013.

OTHER FACTORS AFFECTING BIODIESEL USE

On the national level, biodiesel production continues at a pace to meet the minimum volumes required under the federal renewable fuels program (known as RFS2). For 2012, the minimum volume for biomass-based diesel was 1 billion gallons. Regionally, biodiesel production and use has increased. The U.S. Energy Information Administration reports four active biodiesel plants in Washington and one in Oregon. Much of the regional biodiesel produced is being sold in Oregon, where state law requires all diesel fuel sold in the state for vehicles to contain a minimum of 5 percent biodiesel by volume.

The lack of a fully functional state renewable fuel standard in Washington affects biodiesel availability in the state, but has less of an impact on availability for state agencies due to the state fuel contracts.

RECOMMENDATIONS/ACTION ITEMS

- Monitor completion of the biodiesel blending infrastructure upgrade at the Seattle fuel pier and implementation of the fuel contract amendment that will allow WSF to use biodiesel fuels throughout its fleet.
- Add new B5 Rack product to the rest of the fuel contracts to provide a competitively priced product to contract customers. Promote and monitor purchase of the new B5 product as it becomes available.
- Work with agencies, biodiesel producers, fuel contractors and fuel additive manufacturers on managing biodiesel at higher blends, especially in cold weather.
- Monitor and work to ensure state fuel contracts keep current with changes in the biodiesel and fuel markets and agency needs.
- Ensure lessons learned from state agency experience with biodiesel use are considered in the Extent Practicable rulemaking process. Consider how to integrate efforts to increase the percentage of biodiesel used by state agencies with the larger effort related to agency use of alternative fuels and vehicles.
- Continue fuel quality monitoring to ensure standards are met.

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