



# **Biodiesel Use by Washington State Agencies**

July through December 2014

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### **REPORT HIGHLIGHTS**

- During the last six months of 2014, biodiesel purchased by state agencies under state fuel contracts totaled just over 510,000 gallons. On a calendar-year basis, state agencies topped 1 million gallons in biodiesel purchases for the second year in a row.
- Washington State Ferries (WSF) is the largest state agency consumer of diesel fuel. WSF purchased 342,350 gallons of biodiesel during the last six months of 2014, which is about 30,000 gallons less than the 373,303 purchased in the previous six-month period. Overall, WSF averaged 3.9 percent biodiesel for the period, with fuel containing five percent biodiesel (B5) the standard fuel throughout the fleet.
- Biodiesel purchased by state agencies other than WSF totaled 171,614 gallons during the last six months of 2014. Biodiesel made up 12 percent of the diesel fuel purchased, on par with the previous six-month period.
- The Washington State Department of Transportation (WSDOT) is the state's second largest purchaser of diesel fuel. Biodiesel made up 16 percent of total diesel fuel purchased in Western Washington and 10 percent in Eastern Washington. Statewide, WSDOT averaged 13 percent biodiesel, on par with the previous period.
- 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, state law has mandated state agencies to use biodiesel fuels to operate diesel-powered vessels, vehicles, and construction equipment since 2009. Under current law, WSF is to use a minimum of 5 percent biodiesel in all vessels as long as the price of B5 does not exceed the price of diesel by 5 percent or more. All other state agencies are to use a minimum of 20 percent biodiesel by total volume to operate diesel vessels, vehicles, and construction equipment.

State law (RCW 43.19.646) requires the Department of Enterprise Services (DES) to compile and analyze the use of biodiesel fuel by state agencies and report its findings and recommendations to the Governor and Legislature in an electronic format every six months. DES collaborates with key state agency stakeholders to prepare the report.

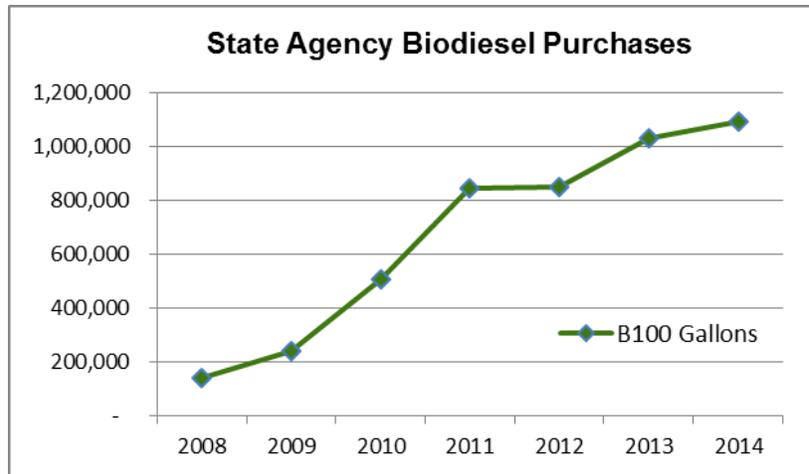
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This report covers July 1 through December 31, 2014, and focuses on bulk fuel purchased through state fuel delivery contracts. The term “biodiesel” means pure biodiesel (B100) unless clearly indicated otherwise. Biodiesel blends are specified by the capital letter “B” followed by a value representing the volume percentage of biodiesel, such as B5 and B20. Therefore, B5 contains 5 percent biodiesel and 95 percent diesel. In tables and charts, biodiesel is expressed in B100 gallons.

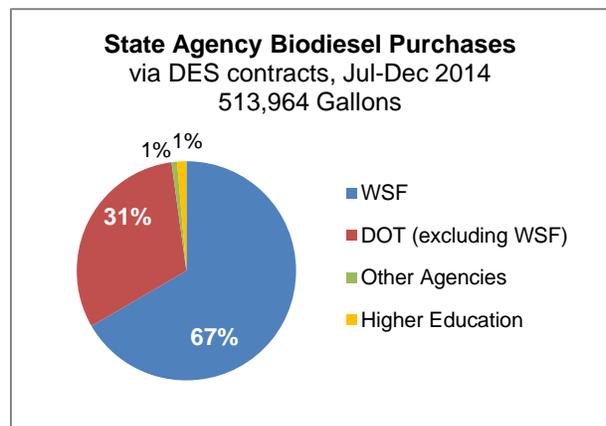
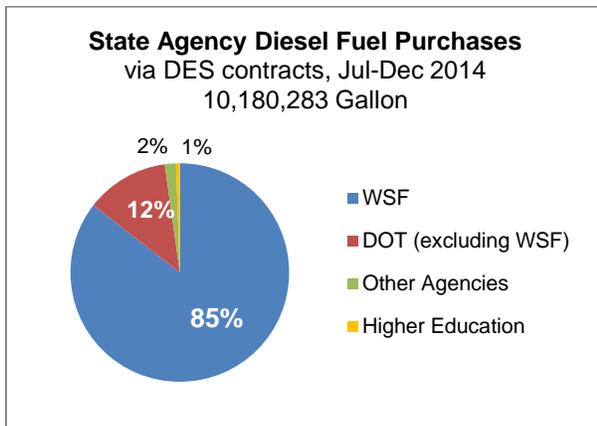
### STATE BIODIESEL PURCHASES

State agencies are required to purchase bulk fuel through the state fuel contracts which cover gasoline, heating oil, and diesel fuel (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, 2014, state agencies and higher education institutions purchased 10.2 million gallons of diesel fuel through state fuel contracts, including about 514,000 gallons of biodiesel. Since the biodiesel use mandate was enacted, state agency purchases have increased significantly and topped 1 million gallons for the second year in a row in 2014.



As the largest consumer of diesel fuel among state agencies, WSF purchased 85 percent of the diesel fuel and 67 percent of the biodiesel purchased during this six-month period. Purchases made by state agencies other than WSF for diesel-powered vehicles and equipment made up 15 percent of total diesel fuel purchased and 33 percent of the biodiesel purchased on state contracts.



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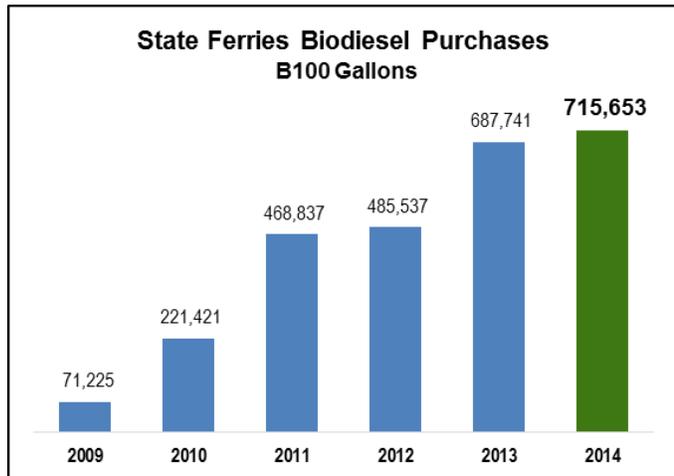
**WASHINGTON STATE FERRIES (WSF) BIODIESEL USE**

- WSF purchased 342,350 gallons of biodiesel during this six-month period. This is an 8 percent decrease from the 373,303 gallons purchased during the first six months of 2014. Total fuel purchased during the period increased 3 percent. Overall, WSF purchases averaged 3.9 percent biodiesel for the period, down from 4.4 percent for the previous period.

**Washington State Ferries Biodiesel Use: January 2009 to December 2014**

Time Period	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
<b>July – Dec. 2014</b>	<b>8,365,368</b>	<b>342,350</b>	<b>8,707,718</b>	<b>3.9%</b>
Jan. - June 2014	8,114,966	373,303	8,488,269	4.4%
July - Dec. 2013	8,545,061	367,534	8,912,595	4.1%
Jan. - June 2013	8,156,700	320,207	8,476,907	3.8%
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%

- Annual biodiesel use by WSF topped 715,000 gallons in 2014. WSF’s progress using biodiesel has occurred in stages, corresponding with the availability of in-line blended B5 fuel. WSF began using B5 for vessels fueled by truck from the Harbor Island truck facility in Seattle in August 2009. Vessels fueled by truck from Anacortes began using B5 in January 2011. Installation of infrastructure for in-line blending of biodiesel at the Seattle Harbor Island dock facility was completed in early 2013. Ferries fueling at this facility began receiving B5 on March 1, 2013.



- During this six-month period, most delivery locations received B5 fuel, with 7 of the 11 locations averaging 4.6 to 5.0 percent biodiesel. Notably, fuel deliveries from Anacortes averaged 2.2 percent biodiesel, as more than half of the deliveries were diesel rather than B5.
- On average, the price of B5 for WSF exceeded the price of diesel by less than 2 percent.
- WSF did not report any biodiesel-related quality or performance issues during the period.

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**LAND SECTOR USE**

State agency purchases of biodiesel for use in vehicles and equipment totaled 171,614 gallons in the last six months of 2014, a decrease of 35,000 gallons over the previous six-month period. Overall state agency biodiesel purchases averaged 11.7 percent of total diesel fuel purchased under the state fuel contract as overall fuel purchased decreased by 198,000 gallons.

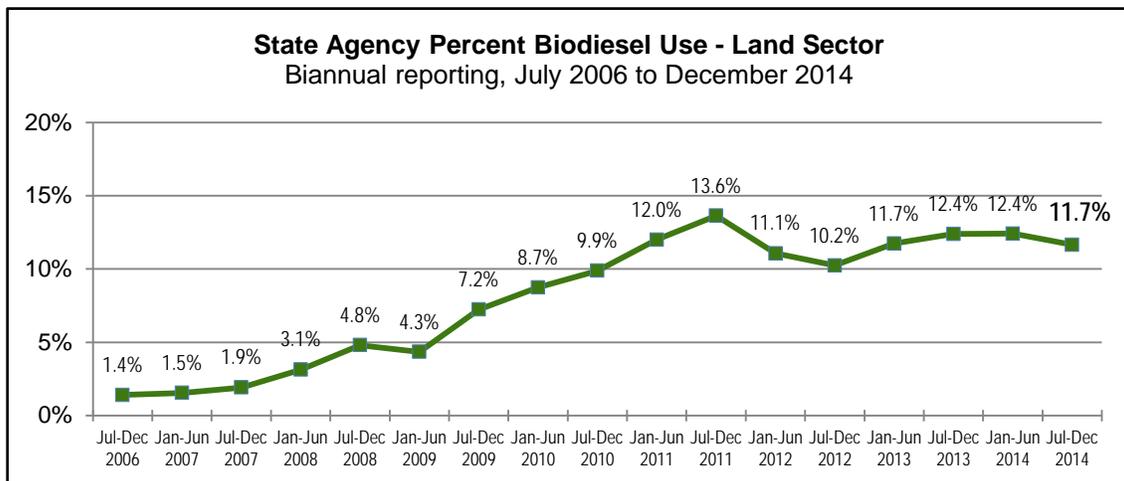
In the land sector, WSDOT is the largest single purchaser of diesel fuel. During this reporting period, WSDOT purchased 1.25 million gallons of diesel fuel, accounting for 85 percent of all diesel fuel and 94 percent of all biodiesel purchased by state agencies under the state fuel contract. WSDOT maintains a comprehensive statewide network of fueling stations that serves the majority of the state’s diesel-powered equipment and vehicles. Of the ten other agencies purchasing diesel fuel under the state contract, only three purchased more than 15,000 gallons of bulk diesel fuel during the period. These were the departments of Corrections, Natural Resources, and Fish and Wildlife.

Among the 14 higher education institutions purchasing diesel fuel off the state contract, the University of Washington was the largest purchaser, accounting for 60 percent of the fuel purchased for vehicles and equipment and all of the biodiesel.

**State Agency Biodiesel Purchases (Land Sector): July to December 2014**

Agency	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
WSDOT	1,087,868	160,400	1,248,268	12.8%
Other Agencies	162,445	4,274	166,719	2.6%
Higher Education	50,638	6,940	57,578	12.1%
<b>Total</b>	<b>1,300,951</b>	<b>171,614</b>	<b>1,472,565</b>	<b>11.7%</b>

On a percentage basis, the biodiesel content of diesel fuel purchased by state agencies for use in vehicles and equipment has averaged above 10 percent for the last eight reporting periods. A lack of availability in Eastern Washington limited efforts to use biodiesel fuels prior to 2011.



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**DETAILS ON WSDOT PURCHASES AND USE**

- Overall, WSDOT’s total biodiesel purchased was down 17 percent and total fuel purchased was down 15 percent from the previous six months. As a result, biodiesel compared to the total diesel volume was down slightly, decreasing from 13.3 percent to 12.8 percent.
  - WSDOT had 45 fuel sites with biodiesel fuel available in Western Washington. From July through September, all deliveries were B20. From October through December, 3 percent of deliveries were B25, 84 percent were B20, 8 percent were B10 and 5 percent were B5. Biodiesel made up 16 percent of total diesel fuel purchased in Western Washington, on par with the previous period.
  - WSDOT had 53 fuel sites with biodiesel fuel available in Eastern Washington. From July through September, all deliveries were B20. From October through December, the percentage of biodiesel in the tanks was reduced for colder weather. During these three months, 2 percent of deliveries were B20, 22 percent were B10, 56 percent were B5, and 20 percent were less than B5. Overall, biodiesel made up 10 percent of total diesel fuel purchased in Eastern Washington during the period, down from 11 percent from the previous six months.

**WSDOT Biodiesel Purchases by Region: July 1 to December 31, 2014**

<b>Region</b>	<b>Diesel Gallons</b>	<b>Biodiesel Gallons</b>	<b>Total Gallons</b>	<b>Biodiesel %</b>
Westside	501,215	98,437	599,651	16.4%
Eastside	586,653	61,963	648,617	9.6%
<b>Statewide Total</b>	<b>1,087,868</b>	<b>160,400</b>	<b>1,248,268</b>	<b>12.8%</b>

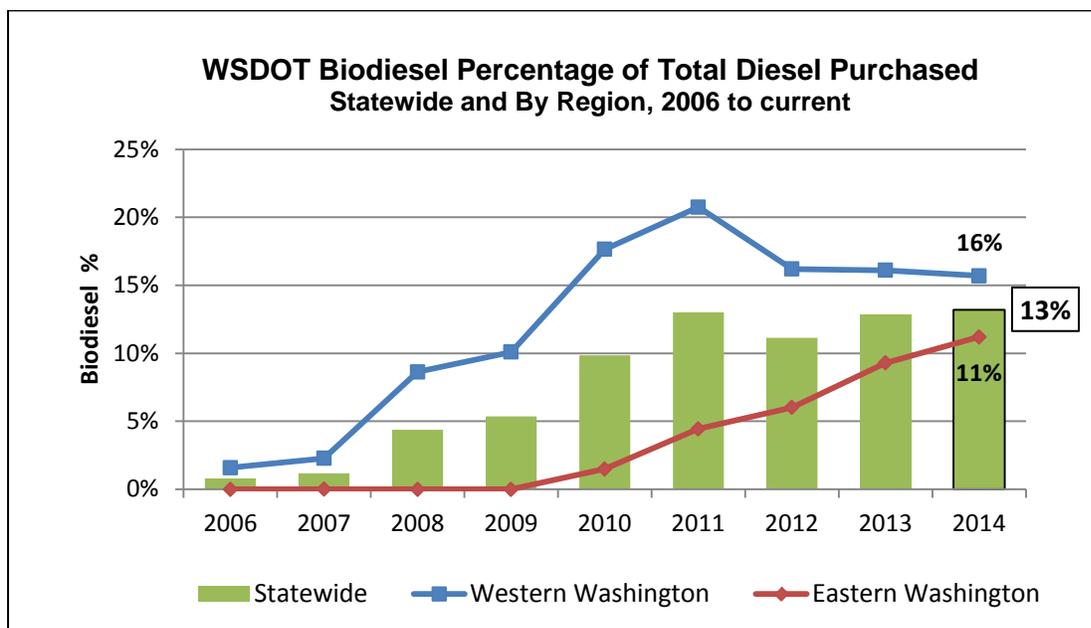
- Four sites in southwest Washington received deliveries without biodiesel in December when the vendor had a major failure at its loading rack which affected tank truck loading for approximately 2 weeks.
- During this period, three Western Washington fuel sites – Bellevue, Everett, and Bellingham – experienced gelling issues when temperatures dropped below 20 degrees F in December.
- WSDOT continued its suspension of purchases of biodiesel blends higher than B20. The suspension began in May 2012 after a review of EPA regulations, newly published guidance, and biodiesel handling guidelines on materials compatibility. The department determined that its diesel fuel tanks must be replaced to meet certification requirements to store biodiesel blends above B20. Replacing tanks is dependent on funding.
- WSDOT’s experience with biodiesel fuels and testing biodiesel blends up to B90 has demonstrated the importance of: (1) managing biodiesel concentration based on climate and conditions; and (2) limiting biodiesel at sites with low fuel turn-over. Currently, WSDOT has 11 sites that are not feasible for biodiesel use because they are in areas that experience cold winter temperatures and have low fuel turn-over (no fuel use for periods of four to six months or longer). WSDOT is working with fuel additive manufacturers to address fuel storage longevity and cold weather operability issues.

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- WSDOT continued to employ best practices for using biodiesel. Operational issues included: (1) Replacing fuel dispenser filters at twice the previous rate; (2) Using a more porous filter to minimize filter failure; and (3) Cleaning tanks at a higher frequency. WSDOT continues to experience higher rates of fuel injector and filter failure which may be attributable to biodiesel use.

On an annual percentage basis, WSDOT biodiesel purchases have averaged above 15 percent for more than four years in Western Washington and topped 10 percent for the first time in Eastern Washington. Prior to May 2012, some sites in Western Washington provided biodiesel blends of up to B40. The lack of biodiesel availability from contractors serving Eastern Washington limited WSDOT's efforts to use biodiesel fuels in that region before 2011.



## FUEL QUALITY

The Washington State Department of Agriculture (WSDA) monitors 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 submitted 125 diesel and biodiesel blend fuel samples to a contract laboratory to test compliance with American Society for Testing and Materials (ASTM) quality standards. Samples were obtained from biodiesel producers, retail outlets and WSDOT fueling sites.

Test results continued to show problems with meeting flash point specifications. Of the 47 samples that did not meet ASTM specifications, 38 samples (81%) failed to meet flash point specifications. Flash point is a safety and handling specification and failures do not immediately affect engine performance. Flash point deficiencies are often caused by contamination with small amounts of gasoline usually attributed to the tank management of transport trucks or design flaws with underground storage tank systems.

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WSDA issued 16 notices of correction and issued two civil penalties to businesses for selling diesel fuels that did not meet specifications. During this period, the program stopped sale at three locations for water in storage tanks.

Overall, WSDA did not identify any significant quality issues with biodiesel fuels during this reporting period.

### **STATE CONTRACTING**

- DES's four fuel contracts serve a wide array of functions and customers. The state's Bulk Fuel contract (#00311), which started in May 2011, is now in its fourth year. The contract covers all regions of the state and encompasses 16 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.
- DES's work with two #00311 contractors to add a B5 Rack product and thereby provide statewide continuity for the supply of biodiesel remained on hold this period.
- DES began researching the feasibility of rebidding large contracts such as the Bulk Fuel contract using a multi-vendor award approach.
- There was considerable work during this period on state marine fuel delivery contracts that serve Washington State Ferries (WSF):
  - Seattle Dock Facility (#01108/#00414): Contract #01108 expired in September and was replaced with a new sole source contract with Maxum Petroleum Company. The sole source contracting requirements were completed September 4 and fueling under the new contract began September 5. The contract provides B5 and diesel fuel, and describes how B6 to B20 blends might be added. The contract has an initial one-year term.
  - Marine Refueling Services-Truck Delivery (#02207): Preparatory work continued to amend this contract to provide for pricing and delivery of B10 for a pilot project planned to start in the summer of 2015.
  - Keller Ferry (#07613): This new contract was awarded January 20, 2014 to Connell Oil Inc. for a one-year term. The contract provides both diesel and biodiesel fuel.
- Two contracts, the Bulk Fuel and the Seattle Dock Facility, require contractors to provide biodiesel that is at least 51 percent in-state sourced. To determine compliance with this contract provision, DES reviews invoices or bills of lading provided by fuel contractors to document the date, quantity, and source of biodiesel purchases. For this report, DES determined that the biodiesel provided under the Seattle Dock Facility contract for calendar year 2014 was 98 percent in-state sourced. No compliance determination was conducted on the Bulk Fuel contract this period.

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**OTHER ACTIVITIES RELATED TO BIODIESEL USE BY STATE AGENCIES**

- **Extent Practicable Rule:** The interagency Alternative Fuels and Vehicles Technical Advisory Group (comprised of the 12 agencies and four educational institutions that collectively represent more than 98 percent of state fuel use) met in August and December 2014 to continue its work to guide implementation of the Extent Practicable Rule, adopted in May 2013 by the Department of Commerce (WAC 194-28). Generally, the rule calls for state agencies to use a minimum of 20 percent biodiesel on an annualized basis. In August, Commerce initiated rulemaking for local government use of alternative fuels and vehicles. An advisory committee was formed and began meeting in September. Draft rules are expected in the spring of 2015.

**RECOMMENDATIONS/ACTION ITEMS**

- Increase the percentage of biodiesel used by WSF at one or more fueling locations within the cost limitation set by the Legislature, beginning with a pilot test with two vessels in 2015.
- Add the 51 percent in-state sourced biodiesel requirement to the Marine Refueling Services contract. Better understand and resolve issues regarding the delivery of B5 from Anacortes under this contract.
- Use the Alternative Fuels and Vehicles Technical Advisory Group to integrate efforts to increase the percentage of biodiesel used by state agencies with the larger effort related to agency and local government use of alternative fuels and vehicles.
- Monitor changes in the biodiesel and fuel markets and work to provide competitively-priced biodiesel fuel products, such as B5 Rack, that keep current with agency needs and the marketplace.
- Continue fuel quality monitoring to ensure standards are met.
- Reduce the frequency of this report to once a year.

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