



# **Biodiesel Use by Washington State Agencies**

**January through June 2012**

*Published December 2012*

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## **REPORT HIGHLIGHTS**

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

- Total biodiesel purchases by state agencies for this period under state fuel contracts were just over 420,000 gallons.
- Washington State Ferries (WSF) is the state's largest consumer of diesel fuel. WSF purchased 223,320 gallons of biodiesel, down seasonally from the 241,722 gallons purchased in the previous six-month period. Fuel containing 5 percent biodiesel (B5) continued to be the standard fuel for most vessels due to in-line blended fuel being available at two of WSF's three fueling sites.
- Biodiesel purchased by state agencies other than WSF totaled 196,933 gallons, slightly less than the 203,113 gallons purchased in the previous six-month period. Biodiesel made up 11 percent of the diesel fuel purchased by agencies other than WSF during this reporting period.
- For the Washington State Department of Transportation (WSDOT), the second largest purchaser of diesel fuel, biodiesel made up more than 16 percent of total diesel fuel purchased in western Washington and almost seven percent of total diesel fuel purchased in eastern Washington. In May, WSDOT suspended its purchases of biodiesel blends above B20 as it undertook a review of the compatibility of its underground storage tanks and fuel dispensers with higher blend biodiesel fuels.
- Testing continued to show no significant fuel quality issues related to biodiesel use by state agencies.

## **BACKGROUND**

The Department of Enterprise Services (DES) is charged with compiling agency biodiesel usage data and reporting findings and recommendations to the Governor and the Legislature on a biannual basis. To more effectively fulfill this requirement, DES collaborates with key state agency stakeholders in preparing this report.

This report covers the period of January 1 through June 30, 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 the context clearly indicates 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.

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 agencies are required to use a minimum of 20 percent biodiesel by total volume for operating diesel-powered vessels, vehicles, and construction equipment. Legislation establishing this mandate, effective June 1, 2009, was enacted in 2006 and is codified in RCW 43.19.642.

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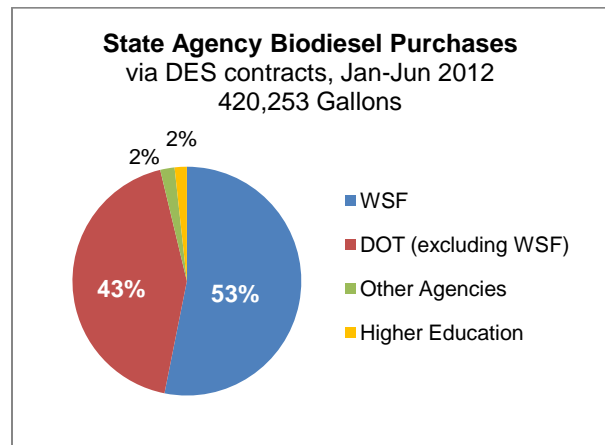
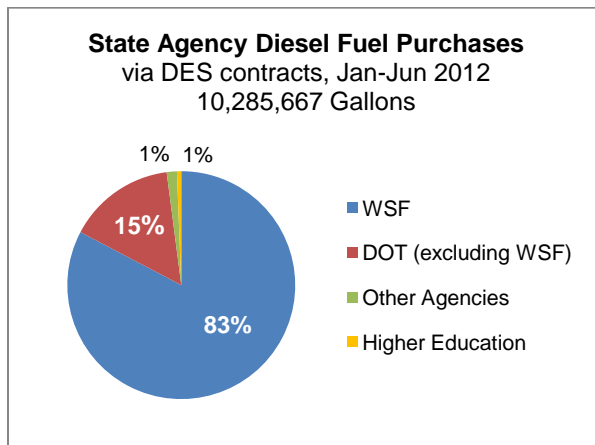
Due to serious infrastructure and budgetary constraints, the biodiesel use requirement for the state ferry system was reduced from a minimum of 20 percent to a minimum of 5 percent. For the 2009-11 biennium, all fuel purchased at the Harbor Island truck terminal in Seattle, one of WSF's three fueling sites, was to be a minimum of 5 percent biodiesel so long as the B5 price did not exceed the price of diesel by more than 5 percent. For the 2011-13 biennium, WSF is to use a minimum of 5 percent biodiesel in all vessels as long as the price of a B5 biodiesel blend does not exceed the price of diesel by 5 percent.

## 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 January 1 through June 30, 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 420,253 gallons of biodiesel. Purchases by the state ferry system made up 83 percent of all diesel fuel and 53 percent of the biodiesel purchased during the period. Total biodiesel use by state ferries 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 43 percent of the biodiesel purchased, which represents 16 percent of total fuel purchased.

Institutions of higher education are not required to use the state fuel contract. However, if purchases by higher education are made using the state fuel contract, they are included in this report.

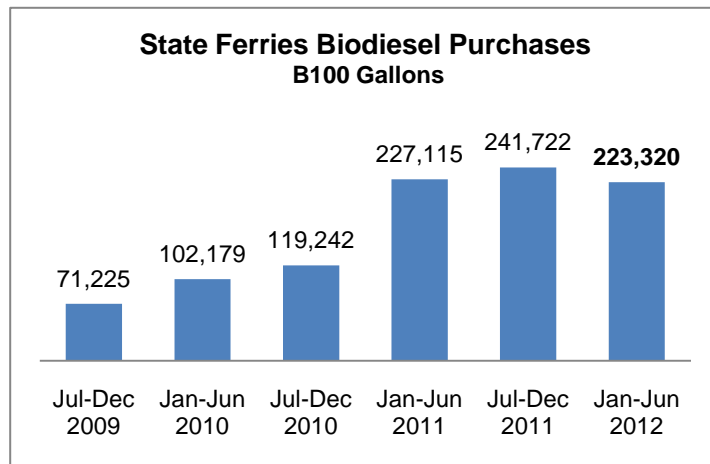


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### WASHINGTON STATE FERRIES (WSF) BIODIESEL USE

- WSF purchased 223,320 gallons of biodiesel during this six-month period. This is an eight percent decrease over the 241,722 gallons purchased in the last six months of 2011. This decrease reflects the reduced winter schedule for state ferries when the Sidney run is not in operation, and more vessels are taken out of service for maintenance to prepare for the busy summer season.
- WSF continued to use in-line blended B5 for all vessels fueling 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 fueling by truck at 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 make in-line blended biodiesel available at the Seattle fuel pier is underway. A 25,000-gallon biodiesel tank has been manufactured and is scheduled to be on site October 1, 2012. The blender, pump, and support electronics are on site and product line work and blender dock site prep work is underway. The project is expected to be finished November 1, 2012 and, once completed, 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 \$3.65 per gallon; the average price paid for B5 was \$3.72 per gallon, for a price differential of less than 2 percent.
- WSF had no biodiesel-related quality or performance issues during the period.



### Washington State Ferries Biodiesel Use: July 2009 to June 2012

Time Period	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
Jan-Jun 2012	8,283,480	223,320	8,506,800	2.6%
Jul-Dec 2011	8,672,324	241,722	8,914,046	2.7%
Jan-Jun 2011	8,435,352	227,115	8,662,467	2.6%
Jul-Dec 2010	8,455,444	119,242	8,574,686	1.4%
Jan-Jun 2010	8,459,772	102,179	8,561,951	1.2%
Jul-Dec 2009	8,463,791	71,225	8,535,016	0.8%

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### LAND SECTOR USE

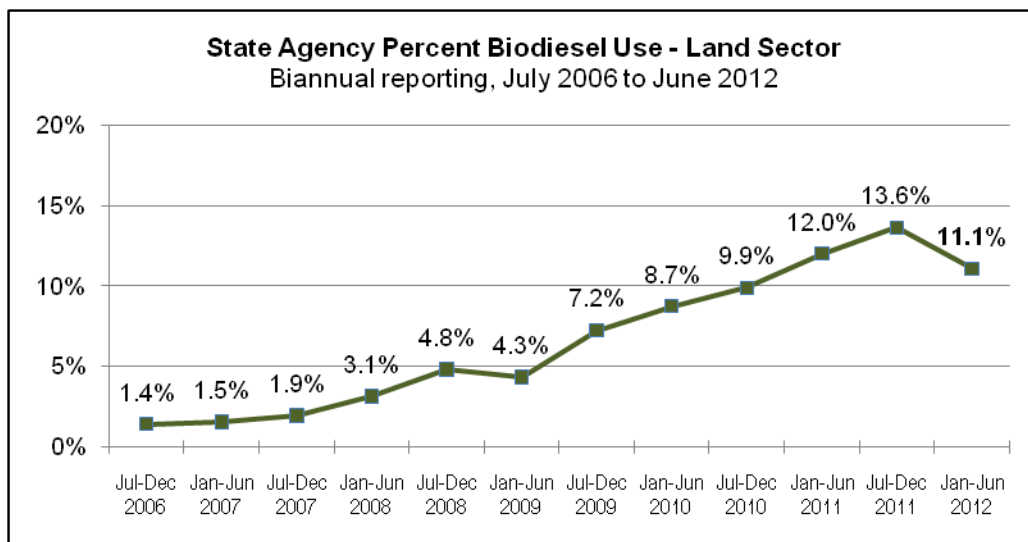
State agency purchases of biodiesel for use in vehicles and equipment decreased slightly from 203,113 gallons in the last six months of 2011 to 196,933 gallons in the first six months of 2012. Overall state agency biodiesel purchases declined from 13.6 percent to 11.1 percent of total diesel fuel purchased under the state fuel contract.

WSDOT is the largest single purchaser of diesel fuel in the land sector. During this reporting period, WSDOT purchased close to 1.6 million gallons of diesel fuel, accounting for 88 percent of all diesel fuel and 92 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 nine other agencies purchasing diesel fuel under the state contract, only four purchased more than 10,000 gallons of bulk diesel fuel during the period. These included the departments of Corrections, Natural Resources, Fish & Wildlife, and Social & Health Services. Among the 14 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): January to June 2012**

Agency	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
WSDOT	1,386,346	181,183	1,567,529	11.6%
Other Agencies	139,893	8,510	148,403	5.7%
Higher Education	55,705	7,240	62,945	11.5%
<b>Total</b>	<b>1,581,944</b>	<b>196,933</b>	<b>1,778,877</b>	<b>11.1%</b>

On a percentage basis, overall state agency biodiesel purchases have generally increased over the last three years.



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## DETAILS ON WSDOT PURCHASES AND USE

- Overall, WSDOT's total gallons of biodiesel purchased was slightly lower than the previous six months and the percent biodiesel compared to total diesel volume declined from 15 percent to 12 percent. This drop in percentage was due to (1) higher total purchases of fuel due to winter weather events, notably January's snow and ice storm and (2) a decision in May to suspend purchases of biodiesel blends higher than B20.
- Based on federal regulations, WSDOT suspended the use of biodiesel blends above B20. The suspension will be in effect until underground storage tanks (USTs) can be certified for higher blends.
  - In July 2011, EPA published final guidance for 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 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.
  - WSDOT is working with industry experts on fuel tank maintenance regarding fuel tank assessment and certification for compatibility with biodiesel blends greater than B20.
- WSDOT 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 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 53 diesel fueling sites, with seven of these identified as sites where biodiesel use is not advised. Of the 46 sites where biodiesel blends continued to be provided, B20 was the standard fuel delivered to 80 percent of the sites. The other sites received deliveries of B10 in January through March and resumed B20 deliveries in April. Selected sites received deliveries of B30 and B40 prior to the mid-May suspension of higher blend purchases. For the period, biodiesel averaged 16 percent in western Washington as compared to total diesel volume purchased; this is down from the 21 percent the region averaged for all of 2011.
- In eastern Washington, WSDOT has 56 diesel fueling sites, with four of these identified as sites where biodiesel use is not advised. During this period, biodiesel was provided at 50 of the 52 fueling sites. January through mid-March, B5 was the standard fuel delivered, except

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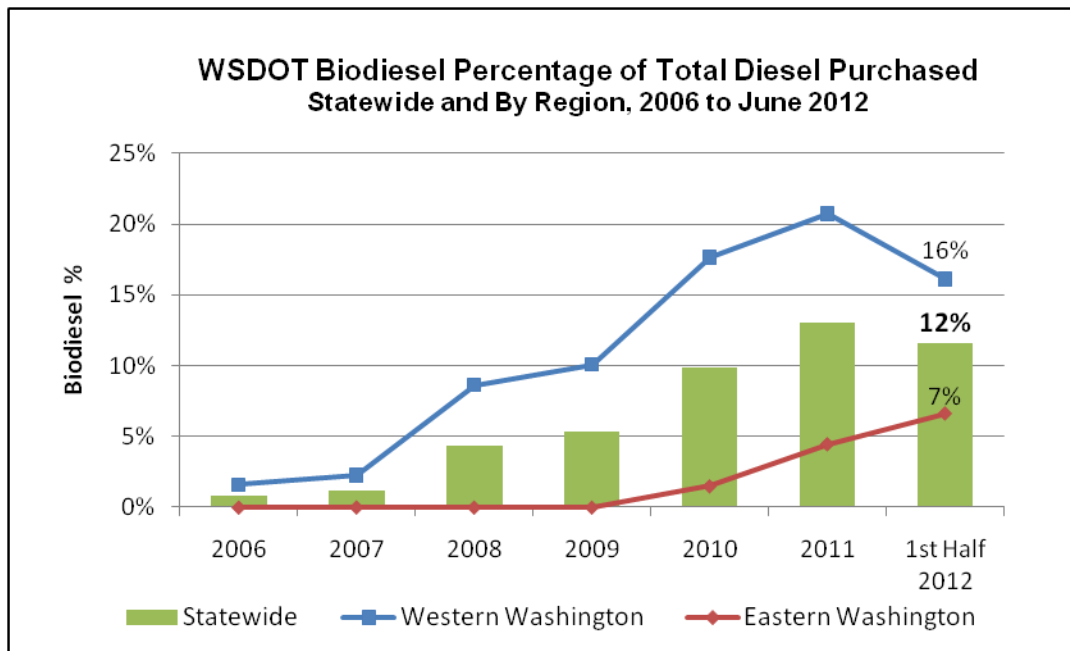
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for seven sites that received B10. Higher blends were purchased as warmer weather returned. For the period, biodiesel averaged 6.6 percent in eastern Washington, up from the 4.4 percent the region averaged for all of 2011. Of the 50 sites, 38 sites averaged 10 percent biodiesel or less and 12 sites averaged 11 percent to 15 percent biodiesel as compared to total diesel volume purchased during the period.

### WSDOT Biodiesel Purchases by Region: January 1 to June 30, 2012

Region	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
Westside	685,675	131,644	817,319	16.1%
Eastside	700,671	49,539	617,185	6.6%
<b>Statewide Total</b>	<b>1,386,346</b>	<b>181,183</b>	<b>1,567,529</b>	<b>11.6%</b>

- WSDOT continued to employ best practices for biodiesel use during the period. However, the following issues remain: (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 failure, which may or may not be attributable to biodiesel use.
- 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 submitted a total of 115 diesel and biodiesel fuel samples to the contract laboratory for testing for compliance with American Society for Testing and Materials (ASTM) quality standards. Samples were obtained from fuel distributors, biodiesel producers, retail outlets and WSDOT sites.

Of the 45 samples collected at WSDOT fueling locations, 38 samples were taken to assist WSDOT in recovering from the inadvertent delivery of high-sulfur kerosene by a contract fuel supplier to 19 of its eastern Washington locations. Of the other seven samples, three (all B20) did not meet the ASTM quality specification on one quality factor (flash point).

Of the 70 samples collected at locations other than WSDOT sites, 25 samples did not meet the ASTM specification on one or more quality factors (flash point, lubricity and/or free water and particle contamination). These samples included 14 diesel, ten B5 and one B20 fuel samples.

Overall, WSDA did not identify any significant fuel quality issues during the period. No performance-related issues were reported to WSDA by state agencies.

## **STATE FUEL CONTRACTING**

- The state bulk fuel contract (Contract #00311), which took effect May 21, 2011, is now in its second year. To date, there are no significant problems to report. 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.
- Contractors were initially allowed six months to meet the in-state sourced biodiesel requirement of 51 percent. Contractor reporting for the last quarter of 2011 revealed some challenges in reporting on this requirement. A process was developed with the assistance of one of the contractors that is now being applied to all contractors. The process includes review of invoices and bills of lading that document the date, quantity, and source of biodiesel purchases.
- As of the end of June, DES was in the process of working with PetroCard, one of the bulk fuel contractors, to add a specific B5 product to its contract. B5 has become a standard product available from fuel suppliers in Washington. The B5 product is expected to provide cost savings to state contract customers. DES anticipates this new product to be available as

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of August 1 and plans to work with the other four contractors to make this product available statewide<sup>1</sup>.

- DES extended the state bulk fuel contract (Contract #00311) through May 20, 2014. DES also extended the two fuel contracts used by Washington State Ferries; the marine refueling services contract (Contract #02207) and the Seattle Harbor fuel dock contract (Contract #01108) now operate through April 25, 2014 and June 30, 2014, respectively.
- Last fall, the state vehicle contracts for 2012/2013 models were amended to require trucks and vans with diesel engines to be certified to use biodiesel blends of up to B20. The new suite of vehicle contracts for the 2013/2014 models will continue to require diesel engines to be B20 certified.

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

- **Biodiesel Cold Weather Management:** Washington State Department of Agriculture (WSDA) hosted a workshop on March 22, 2012 in Olympia for state contractors and major state agency diesel fuel users that focused on managing biodiesel at higher blends, especially in cold weather. More than 60 participants attended, including petroleum refiners, fuel distributors, state government customers, and fuel testing laboratory staff. The workshop topics included a broad look at the basics of petroleum and biodiesel, cold weather performance, handling and storage, and fleet operations. Subject matter experts from the National Biodiesel Board (NBB), oil refiners, biodiesel producers, and additive manufacturers were featured speakers at the event. The departments of Transportation, Agriculture, Enterprise Services, Commerce and NBB held follow-up discussions which focused, in part, on compatibility of tanks, dispensers, and associated infrastructure with higher biodiesel blends. The NBB experts recommended the Washington State Department of Transportation work with a third-party vendor to assess and certify sites for compatibility with biodiesel blends greater than B20.
- **Extent Practicable Rulemaking:** The Department of Commerce filed a Pre-Proposal Statement of Inquiry (CR-101) in January that initiated a 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 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. Legislation passed in 2012 (ESHB 2545) authorizes use of compressed natural gas (CNG), liquid natural gas (LNG) and propane from fossil fuel sources to meet these requirements if Commerce determines that biofuels and electrification are not reasonably available.

Commerce established an interagency work group – which includes the Washington State University Extension Energy program and state departments of Transportation, Agriculture, Ecology and Enterprise Services – to guide rule drafting. A public

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<sup>1</sup> After the reporting period covered by this report, the negotiation was successful and B5 is now available on contract.

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workshop to gather stakeholder suggestions is to be held in the fall of 2012. A public hearing on the proposed rule will be held before it is finalized.

- **Alternative Fuel Use Reporting:** In an effort to streamline state agency reporting of use of biodiesel and other alternative fuels, Commerce and Washington State Department of Agriculture worked with the Department of Ecology during this reporting period to help revise the “Fleet Energy Use” section of the calculator used by state agencies to report greenhouse gas emissions.

### **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 is 1 billion gallons. Regionally, biodiesel production and use is increasing. The U.S. Energy Information Administration reports four active biodiesel plants in Washington and one in Oregon. Much of this regional biodiesel production 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 generally but has less of an impact on availability for state agencies due to the state fuel contracts.

### **RECOMMENDATIONS/ACTION ITEMS**

- Continue efforts to increase biodiesel use by state agencies.
  - Monitor timely completion of the biodiesel blending infrastructure upgrade at the Seattle fuel pier that will allow Washington State Ferries to use biodiesel fuels throughout its fleet.
  - Promote and monitor purchase of the new B5 product as it becomes available on state fuel contracts.
  - Work with agencies, biodiesel producers and fuel contractors on managing biodiesel at higher blends, especially in cold weather.
- Monitor and work to ensure state fuel contracts allow state agencies to benefit from the sourcing of lower-cost in-state biodiesel.
- Ensure lessons learned from state agency experience with biodiesel use are considered in the Extent Practicable rulemaking process.
- Continue to encourage vehicle manufacturers to approve use of higher blends of biodiesel.
- Continue fuel quality monitoring to ensure standards are met.

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