



Washington State Department of
Enterprise Services

Biodiesel Use by Washington State Agencies

July through December 2013

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REPORT HIGHLIGHTS

- During the last six months of 2013, total biodiesel purchases by state agencies under state fuel contracts was just above 545,000 gallons, an increase of 11 percent over the previous six months. Together with purchases in the first six months of the year, biodiesel purchases topped 1 million gallons for the first time ever for a calendar year period.
- Washington State Ferries (WSF) is the state's largest consumer of diesel fuel. WSF purchased 367,534 gallons of biodiesel during the last six months of 2013, the most ever purchased for a six-month period. Overall, WSF reached an average of 4.1 percent biodiesel for the period, as fuel containing five percent biodiesel (B5) become the standard fuel throughout the fleet.
- Biodiesel purchased by state agencies other than WSF totaled 178,360 gallons during this six-month period. 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 almost 17 percent of total diesel fuel purchased in Western Washington and 9 percent in Eastern Washington. Statewide, WSDOT averaged 13 percent biodiesel, up from 12 percent during 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.

This report covers July 1 through December 31, 2013, 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

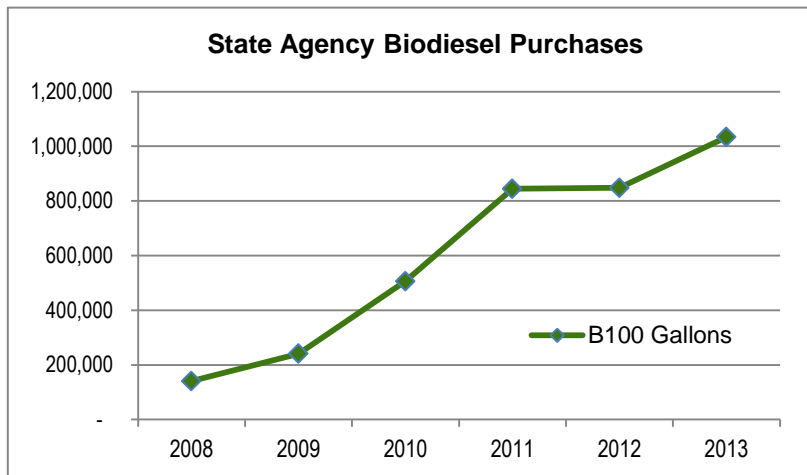
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the value representing the volume percentage of biodiesel, such as B5 and B20. Therefore B5 contains 5 percent biodiesel. In tables and charts, biodiesel is expressed in B100 gallons.

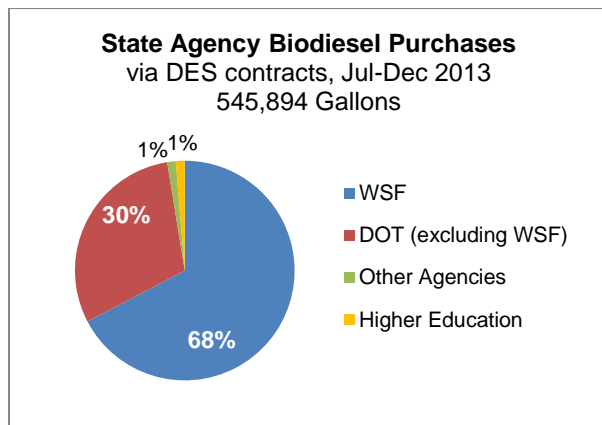
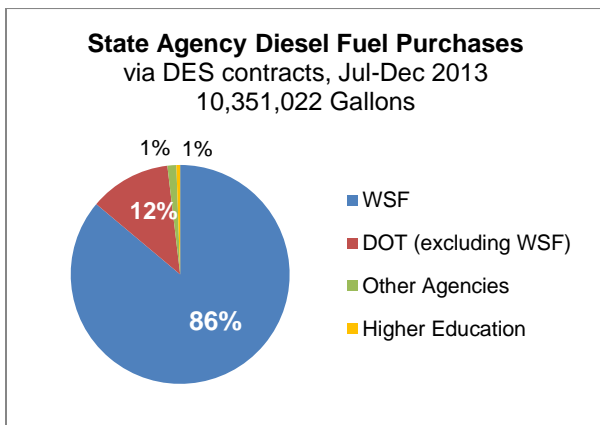
STATE BIODIESEL PURCHASES

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, 2013, state agencies and higher education institutions purchased 10.4 million gallons of diesel fuel through state fuel contracts, including about 545,000 gallons of biodiesel, a 55,000-gallon increase from the previous six-month period. Together with purchases for the first six months of the year, biodiesel purchases topped 1 million gallons for the first time ever for a calendar year period.



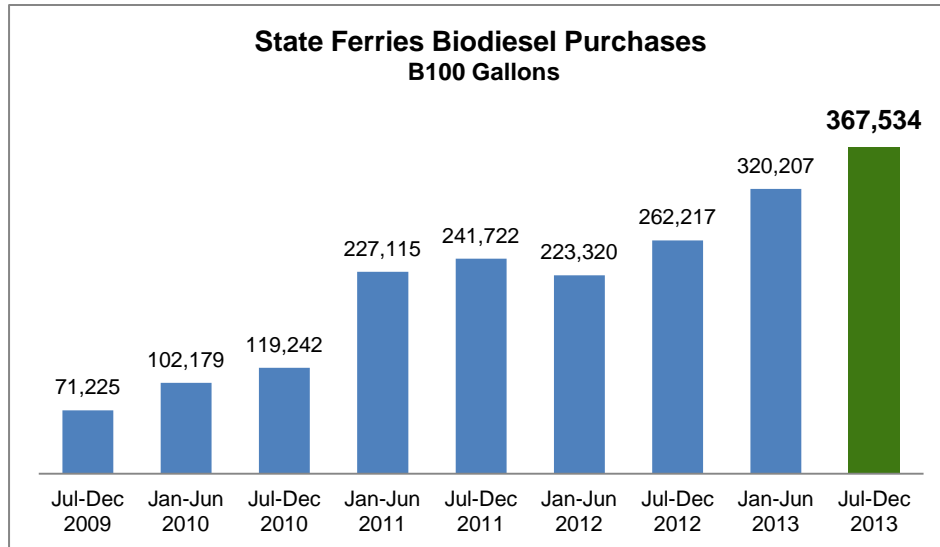
During this period, WSF purchases made up 86 percent of all diesel fuel and 68 percent of the biodiesel purchased. Total biodiesel use by state ferries increased as B5 became the standard fuel for all vessels. Purchases made by state agencies other than WSF for diesel-powered vehicles and equipment made up 14 percent of total fuel purchased and 32 percent of the biodiesel purchased on state contracts.



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WASHINGTON STATE FERRIES (WSF) BIODIESEL USE

- WSF purchased 367,534 gallons of biodiesel during this six-month period. This is a 15 percent increase over the 320,207 gallons purchased during the first six months of 2013 and a 40 percent increase from the same period in 2012. The increase is due to the completion of the in-line blending infrastructure at the Harbor Island dock facility in Seattle, which in March 2013 allowed fuel containing 5 percent biodiesel (B5) to become the standard fuel for the entire fleet.



- WSF's progress using biodiesel has occurred in stages, corresponding with the availability of in-line blended B5 fuel.
 - WSF began using in-line blended B5 for all vessels fueled by truck from the Harbor Island truck facility in Seattle in August 2009. This facility accounts for about 25 percent of the total fuel used by the state ferry system.
 - WSF has used in-line blended B5 for all vessels fueled by truck from Anacortes since January 2011. This facility accounts for about 40 percent of the total fuel used.
 - The capital improvement project to build the infrastructure for in-line blending of biodiesel at the Seattle Harbor Island dock facility was completed in late February 2013. Ferries fueling at the dock facility began using B5 on March 1, 2013. This facility accounts for about 35 percent of the total fuel used.
- Overall, WSF reached an average of 4.1 percent biodiesel for the period, up from 3.8 percent for the previous period.
- The average price paid for diesel fuel during the period was \$3.13 per gallon; the average price paid for B5 was \$3.15 per gallon, a differential of less than 1 percent.
- 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 2013

Time Period	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
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%

LAND SECTOR USE

State agency purchases of biodiesel for use in vehicles and equipment totaled 178,360 gallons in the last six months of 2013, slightly more than the 172,045 gallons in the first six months of 2013. Overall state agency biodiesel purchases held steady at 12.4 percent of total diesel fuel purchased under the state fuel contract.

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 87 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 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:

- Department of Corrections,
- Department of Fish and Wildlife, and
- Department of Natural Resources.

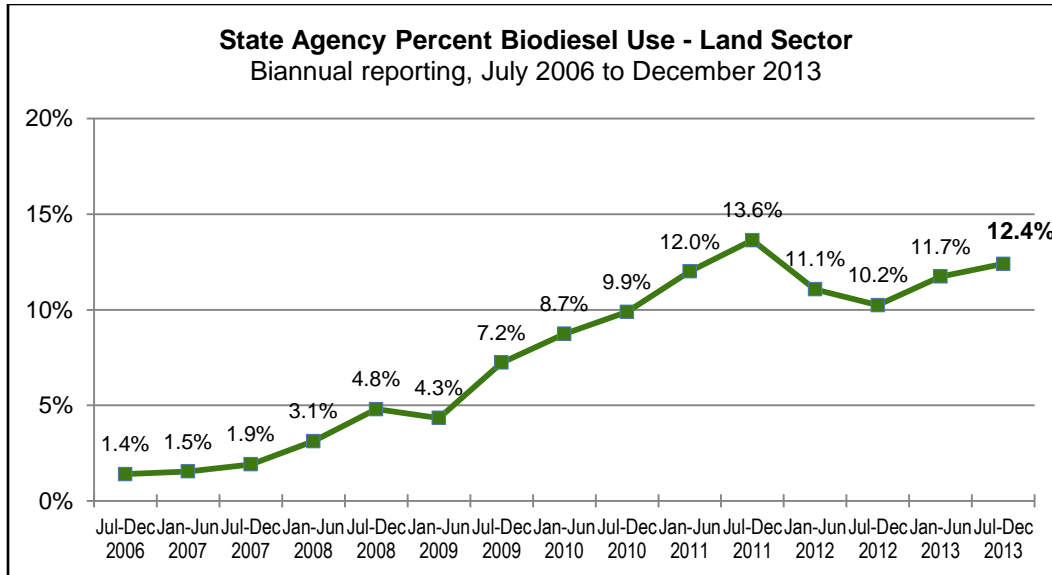
Among the 12 higher education institutions purchasing diesel fuel off the state contract, the University of Washington was the largest purchaser, accounting for 63 percent of the fuel purchased for vehicles and equipment and including all of the biodiesel.

State Agency Biodiesel Purchases (Land Sector): July to December 2013

Agency	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
WSDOT	1,080,564	164,360	1,244,925	13.2%
Other Agencies	129,133	6,840	135,973	5.0%
Higher Education	50,369	7,160	57,529	12.4%
Total	1,260,066	178,360	1,438,427	12.4%

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On a percentage basis, biodiesel purchases by state agencies for use in vehicles and equipment has significantly increased since 2006 and averaged above 10 percent for the last six reporting periods. The lack of available biodiesel in Eastern Washington limited efforts to use biodiesel fuels prior to 2011.



DETAILS ON WSDOT PURCHASES AND USE

- Overall, WSDOT’s total biodiesel purchased was up 1 percent from the previous six months while the total gallons of fuel purchased decreased slightly. As a result, biodiesel compared to the total diesel volume increased from 12.3 to 12.6 percent.
 - WSDOT had 45 fuel sites with biodiesel fuel available in Western Washington. During this reporting period, 89 percent of fuel deliveries were B20, 1 percent were B15, 8 percent were B10, and, with one exception, the remaining were B5. Deliveries were reduced to B5 at two sites due to cold weather. Biodiesel made up more than 16 percent of total diesel fuel purchased in Western Washington, up from 15 percent the previous period.
 - WSDOT had 53 fuel sites with biodiesel fuel available in Eastern Washington. From July through September, 83 percent of deliveries were B20, 12 percent were B10 and five percent were B5 or less. From October through December, delivery percentages were reduced to account for cold weather. During this time, 2 percent of deliveries were B20, 11 percent were between B10 and B15, 30 percent were B10, 35 percent were between B5 and B10, and 22 percent were B5 or less. Overall, biodiesel made up almost 9 percent of total diesel fuel purchased in Eastern Washington during the period, comparable to the previous six months.

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WSDOT Biodiesel Purchases by Region: July 1 to December 31, 2013

Region	Diesel Gallons	Biodiesel Gallons	Total Gallons	Biodiesel %
Westside	534,036	108,812	642,848	16.9%
Eastside	546,529	55,548	602,077	9.2%
Statewide Total	1,080,564	164,360	1,244,925	13.2%

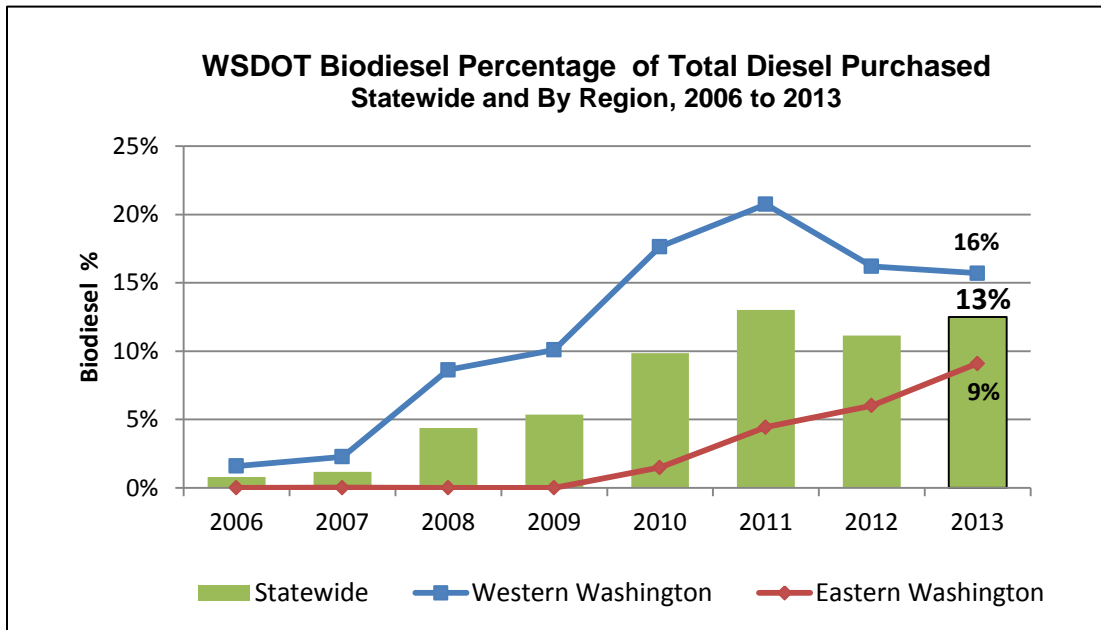
- WSDOT continued its suspension of purchases of biodiesel blends higher than B20. The suspension began in May 2012 after a review of EPA regulations (40 CFR 280.32), recently published guidance, and biodiesel handling guidelines on materials compatibility. WSDOT worked with industry experts to assess its fuel tanks. 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.
- 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.
- WSDOT experienced gelling issues in tank dispensers and vehicle filters in Western Washington during cold weather in November. WSDA tested fuel samples from 18 tanks at 14 sites. There was no evidence showing biodiesel was related to the problem. The conclusion is that the vendor did not add the necessary cold weather fuel additives.

On a percentage basis, WSDOT biodiesel purchases have significantly increased since 2006. Biodiesel use declined in Western Washington due to the suspension of using biodiesel blends higher than B20. Prior to the suspension, 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.

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In 2013, the increase in biodiesel gallons and in biodiesel percentage from 2012 was due to increased biodiesel purchases in Eastern Washington.



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 115 diesel and biodiesel fuel samples to a 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 collected 7 diesel and 16 biodiesel fuel samples for laboratory testing at WSDOT fueling sites. Five samples showed the presence of particles or water, which may be a fuel handling issue; one sample failed an oxidation stability test. Most of these samples were taken in response to WSDOT concerns about filter plugging in several vehicles and dispensers in its Northwest and Olympic regions. Tests did not reveal deficiencies in the biodiesel. The agencies will continue to investigate the problems.

The program collected 92 samples for laboratory testing from retail and distribution sites: 34 were biodiesel blends and 58 were ultra low sulfur diesel. Thirty-five samples showed the presence of particles or water, 21 did not meet flash point specifications, and 3 did not meet lubricity requirements. In total, 52 of the 98 samples failed to meet one or more ASTM specification. Of these, only two were samples of biodiesel blends above B5.

While these types of fuel quality deficiencies do not cause immediate engine problems, WSDA is working with the industry to determine causes and corrective actions. The presence of

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particles and water and flash point deficiencies are usually fuel handling issues. Flash point deficiencies are often caused by contamination with small amounts of gasoline usually attributed to the tank management of transport trucks.

In addition to taking fuel samples for laboratory testing, WSDA inspectors regularly checked for water in fuel storage tanks, conducted a visual test for clarity and contamination, and, on occasion, checked biodiesel blend levels.

WSDA issued 19 Notices of Correction to businesses for fuel that did not meet specifications. During this period, the program stopped sale at four locations for water in storage tanks and issued four civil penalties for repeat quality violations.

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

STATE CONTRACTING

- The state'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 third 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.
- In July 2013, Coleman Oil and Powell Christiansen added a new biodiesel fuel product (B5 Rack) to their bulk fuel contracts which cover Eastern Washington. B5 has become a standard product available from fuel suppliers in Washington. This change provides a competitively-priced product to contract customers and cost savings to state contract customers. A B5 Rack product has been available from PetroCard since August 2012. DES plans to work with the two remaining contractors to make this product available statewide in 2014.
- There was considerable work during this period on state marine fuel delivery contracts which serve Washington State Ferries (WSF):
 - #01108 (Seattle Dock Facility): Work began during this period to renegotiate this sole source contract which expires in March 2014. The new contract is expected to continue to include a B5 fuel and may also include fuels that contain up to 20 percent biodiesel.
 - #02207 (Marine Refueling Services - Truck Delivery): Work began this period to amend the contract to provide for pricing and delivery of B10 for a pilot project planned to start in spring 2014.

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- #07613 (Keller Ferry): DES expects to award a new contract to provide fuel for the Keller Ferry in January 2014. The contract will provide for both diesel and biodiesel fuel.
- The bulk fuel and marine dock delivery contracts 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. The data shows compliance well above the 51 percent threshold for this reporting period.
- Progress on several fuel contract action items was delayed this period due to higher priority issues related to statewide Procurement Reform.

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) had quarterly meetings in August and November 2013 to continue its work to guide implementation of the Extent Practicable rule, adopted in May 2013 by the Department of Commerce (WAC 194-28). The rule defines practicability and clarifies how state agencies are evaluated to determine 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. The rule states that, unless otherwise limited by law, it is considered practicable for state agencies to use a minimum of 20 percent biodiesel on an annualized basis when purchasing fuel through the state procurement system. Agencies are encouraged to make good faith efforts to identify sources and buy a minimum of B20 when purchasing fuel from retail outlets.

RECOMMENDATIONS/ACTION ITEMS

- Determine necessary actions to increase the percentage of biodiesel used by WSF at one or more fueling locations within the cost limitation set by the Legislature. Continue preparatory work and planning for pilot test with two vessels in 2014.
- Explore adding the 51 percent in-state sourced biodiesel requirement to the Marine Refueling Services contract.
- Support work to prioritize replacement of fuel storage tanks in western Washington to allow WSDOT to resume purchasing higher biodiesel blends at major fuel sites.
- Work with agencies, biodiesel producers, fuel contractors, and fuel additive manufacturers regarding managing biodiesel at higher blends, especially in cold weather.
- 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 use of alternative fuels and vehicles.

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- Continue to add new B5 Rack product to fuel contracts to provide a competitively-priced product to contract customers. Promote and monitor purchase of the new B5 product as it becomes available.
- Monitor and work to ensure state fuel contracts keep current with changes in the biodiesel and fuel markets and agency needs.
- Continue fuel quality monitoring to ensure standards are met.
- Reduce the frequency of this report to once a year.

CONTRIBUTORS

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