



General Administration
STATE OF WASHINGTON

Biodiesel adoption in Washington

January through June 2009

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BACKGROUND

In an effort to reduce Washington State's dependence on foreign oil and to further stimulate the local production and use of biodiesel, the Legislature in 2006 enacted Engrossed Substitute Senate Bill 6508. This bill required state agencies to use a biodiesel blend of not less than 2 percent (B2-blend) beginning on June 1, 2006 escalating to a 20 percent (B20-blend) by June 1, 2009.

Together, state agencies and institutions of higher education purchase approximately 29 million gallons of fuel annually, 70 percent of which is diesel with 94 percent being supplied to Western Washington and 6 percent in Eastern Washington. Of that, the Department of Transportation (DOT), including WSF, account for approximately 96 percent of the entire diesel purchased by the state.

To satisfy state government's need for bulk fuel and to most effectively leverage Washington's collective buying power, the Department of General Administration (GA) invited all local governments to participate in the creation of the state's bulk-fuel delivery contracts. This action enabled GA to leverage the projected purchasing power of more than 44 million gallons of fuel annually, 97 percent of which is purchased in Western Washington. Although DOT (including WSF) is the largest single contract user, as of this writing there are now more than 120 government entities utilizing the state contract, equaling 65 million gallons of fuel annually.

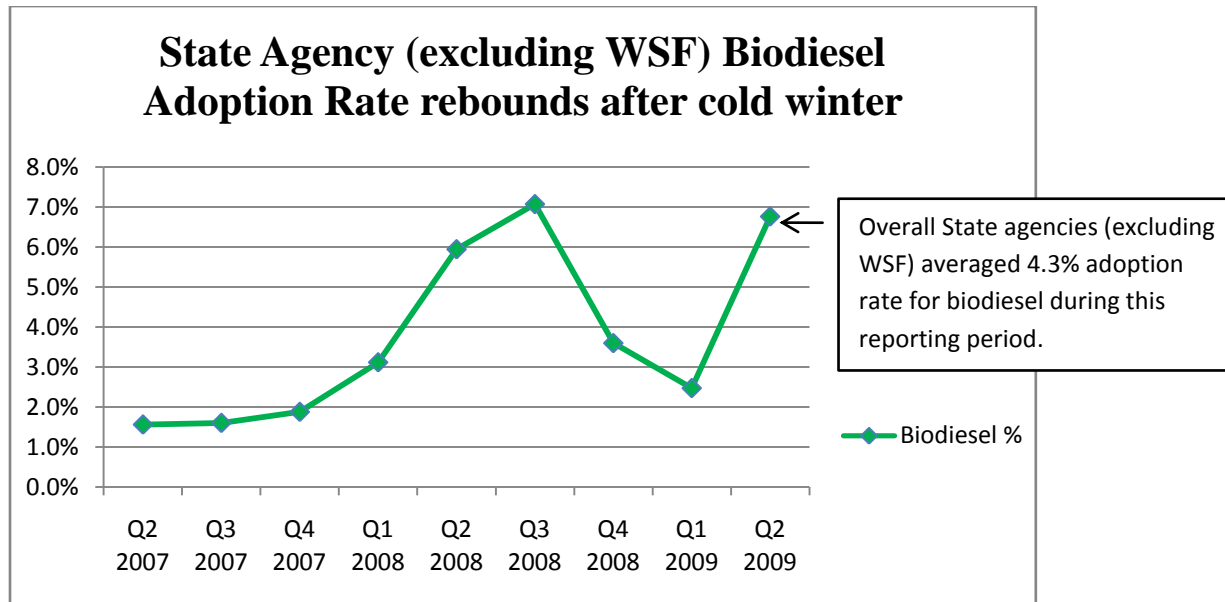
Of significance we note that the GA fuel contracts were crafted to allow contractors the opportunity to take advantage of new sources of biodiesel supply. This strategy was needed to flex with the rapidly evolving biodiesel market and to prevent new Washington biodiesel producers from being locked out of the Washington state government market. Moreover, fuel purchasers may order whatever biodiesel blend ratio they desire, and depending upon the quality assurance needs, fuel purchasers may choose from two different grades of biodiesel. However, budgetary pressures, product availability and weather conditions were key factors influencing the percentage of biodiesel purchased.

In the wake of unprecedented revenue shortfalls, the 2009 legislature enacted Engrossed Substitute Senate Bill 5352 (Transportation Budget) which reduced the biodiesel requirement for the Washington State Ferries (WSF) to 5 percent (B5-blend) for the 2009-2011 fiscal biennium provided the price does not exceed the price of diesel by more than 5 percent.

EXECUTIVE SUMMARY

Even with unprecedented budgetary challenges, state agencies ended the first half of 2009 with only slightly diminished biodiesel usage than the previous six-month period. Although a drop in biodiesel purchases continues during the cold winter months, state fuel contract purchasing data for this reporting period shows that biodiesel adoption by state agencies and higher education (excluding ferries) exceeded the 2 percent requirement, yet fell from 4.8 percent to 4.3 percent during the first half of 2009. However, over the last 30 days of this reporting period (June 1st through June 30th) in which the 20 percent blend requirement became effective, three of the four

largest land based consumers of biodiesel have made great strides toward meeting the requirement. Specifically, DOT, the Department of Natural Resources (DNR) and the University of Washington (UW) biodiesel usage climbed to 9.1 percent, 18.2 percent and 19.8 percent respectively.



Diesel and Biodiesel Purchases using state contracts (Q1 & Q2 2009)

MARINE USE

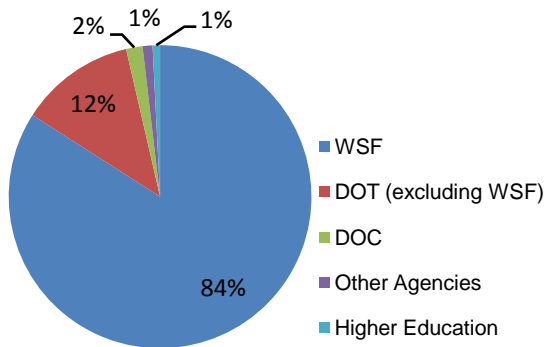
Agency Name	Diesel	Biodiesel	Total Gallons	Biodiesel %
WSF	8,269,302	30,714	8,300,016	0.4%

LAND USE

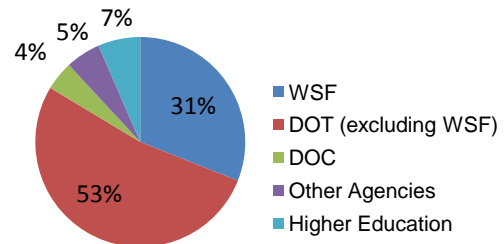
Agency Name	Diesel	Biodiesel	Total Gallons	Biodiesel %
DOT (excluding WSF)	1,166,730	52,105	1,218,835	4.3%
DOC	168,737	4,440	173,177	2.6%
Other Agencies	99,168	5,345	104,513	5.1%
Higher Education	71,835	6,447	78,282	8.2%
Totals (w/o WSF)	1,506,470	68,337	1,574,808	4.3%
Totals (including WSF)	9,775,772	99,051	9,874,824	1.0%

(The WSF Biodiesel Pilot ended during Q1 2009. WSF used no biodiesel during Q2 2009.)

State Ferries and DOT are largest consumers of diesel fuel (9,874,824 total gallons purchased between 01/09-06/09)



Biodiesel Volumes
99,051 total gallons of biodiesel purchased between 01/09 - 06/09. (*WSF Biodiesel Pilot ended in 02/09)



KEY UPDATES IN THIS REPORT (details follow)

- To further stimulate the purchase of biodiesel, GA hosted a biodiesel forum in which 80 stakeholders attended representing state government, biodiesel producers, fuel contract distributors, fuel wholesalers and other relevant contributors.
- WSF has scaled back biodiesel usage following the conclusion of its biodiesel pilot project.
- DOT, who is the largest consumer of diesel for land based operations, has boosted its use of biodiesel to 9.1 percent during the first month in which the 20 percent requirement became effective.
- Both DNR and UW are making great strides in attaining the 20 percent usage requirement.

WASHINGTON STATE FERRIES UPDATE

WSF concluded its pilot project in February 2009, and the [Biodiesel Research and Demonstration Project Report](#) was issued on April 30, 2009. The amount of biodiesel purchased during January and February was only 30,714 gallons, which resulted in an adoption rate for WSF of 0.37% for the first half of 2009. The project was an operational success, and key excerpts included in their report include:

“a)ASTM biodiesel fuel standards provided adequate safeguards to ensure high product quality.”

“b) Fuel quality was not affected by biodiesel feedstock (i.e. soy, canola, high cloud point fuel).”

“c)The percentage of biodiesel (B5 – B20) used in the fuel did not impact vessel operations.”

“d) Use of biocides is recommended in all future testing with biodiesel. Although comparisons of sludge formation between conventional diesel fuel and biodiesel were primarily anecdotal, vessel operations using biodiesel may require increased maintenance of fuel filtration systems.”

“e)The high humidity of marine environments appears to promote microbial growth.”

As noted earlier, due to budgetary pressures, the 2009 legislature enacted Engrossed Substitute Senate Bill 5352 which reduced WSF’s biodiesel requirement to a 5 percent blend of biodiesel for the 2009-2011 fiscal biennium, provided the price of the biodiesel fuel did not exceed the price of diesel by more than 5 percent. Beginning in August 2009, WSF began purchasing a B5

biodiesel blend for approximately one-third of WSF's vessels. The state is working with the fuel contractor to overcome operational and logistical challenges so as to expand the B5 biodiesel blend to the rest of the fleet. Delivery to additional vessels is expected to begin at the end of 2009, once in-line blending becomes available from the contractor's primary fuel supply terminals, and provided the price is within the required 5% price cap. One fundamental issue that needs to be addressed, before WSF fleet and state contractors will be in a position to make the transition to a B20 blend, is the need for the biodiesel supply infrastructure to be upgraded to support in-line blending.

STATE AGENCY AND HIGHER EDUCATION LAND USE PROGRESS

DOT land operations was unable to sustain its efforts to increase the overall use of biodiesel during the first half of 2009, decreasing its overall adoption rate from 5.4 percent to 4.3 percent.

Difficulties with fuel gelling and equipment operation during cold weather resulted in DOT continuing to reduce its use of biodiesel during the first quarter of 2009 by ordering a B10 blend of biodiesel. A series of snow storms and extended periods of cold temperatures at some Western Washington and high mountain passes forced DOT to temporarily lower its use of biodiesel, achieving an adoption rate of only 2.4% for the first quarter of 2009.

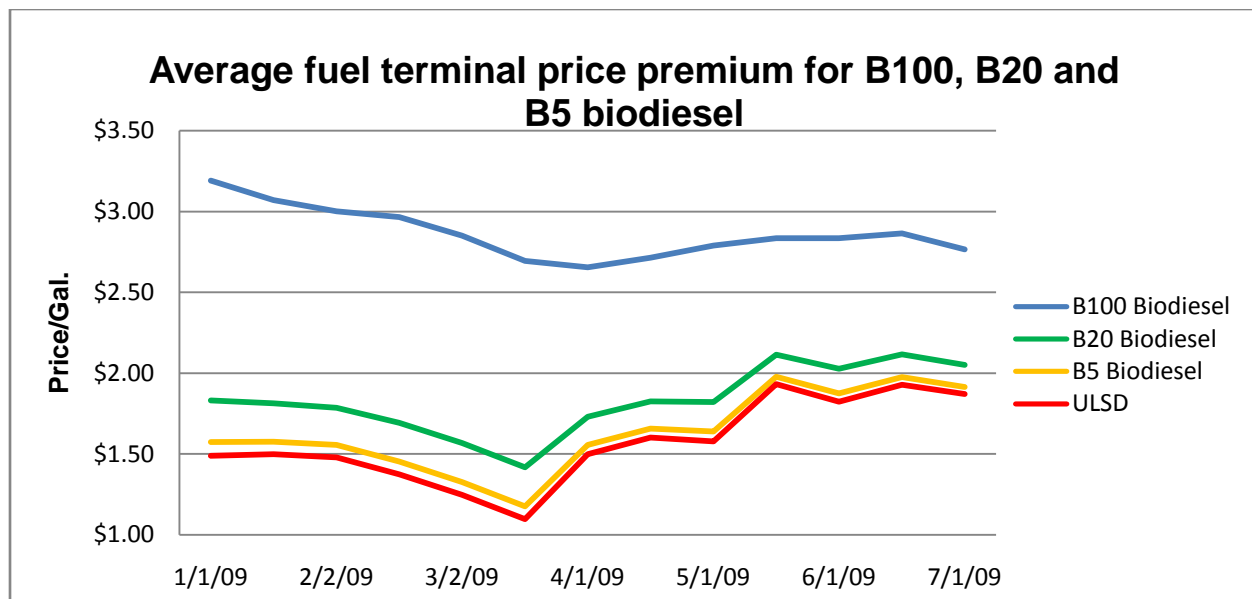
As temperatures warmed during the second quarter of 2009, DOT resumed the use of a B20 blend of biodiesel whenever and wherever it was available from contract fuel suppliers. This resulted in an adoption rate of 7 percent for this quarter and an overall adoption rate of 4.3% for the first half of 2009. Additionally, the biodiesel supply chain in Eastern Washington is still maturing and affecting DOT's efforts to increase its usage in this region.

State fuel contractors supply DOT with biodiesel, which is then made available to other state agencies through DOT's network of refueling stations. In so doing, DOT makes biodiesel more readily available to state government. Over this 6-month reporting period, at least four state agencies (the departments of Transportation (4.3%), Corrections (DOC) (2.6%), Social and Health Services (DSHS) (4.4%) and DNR (12.9%)) exceeded the 2 percent utilization by purchasing biodiesel for their diesel storage tanks.

With the notable exception of the UW, state universities, colleges and community colleges continued to lag behind state agencies in the adoption of biodiesel fuel. During the month of June 2009, the adoption rate for UW was 19.8 percent. However, biodiesel usage for other educational institutions that historically purchase relatively low volumes was low due to the fuel delivery logistics associated with ordering small quantities of biodiesel delivered into small storage tanks. What we found is that the educational institutions that historically purchase relatively low volumes are doing so for the purpose of heating oil, which is exempt from the B20 requirement.

BIODIESEL PRICE PREMIUM

During this reporting period the average fuel terminal price for B100 biodiesel was \$1.29 per gallon higher than the average price for diesel fuel. In Western Washington the average price for B100 was \$2.86 per gallon while the average price for diesel was \$1.59 per gallon. On average, a B20 blend cost an additional 26 cents per gallon or a 16% higher price. On average, a B5 blend cost an additional 6 cents per gallon or a 4% higher price, as illustrated in the graph below. Market research suggests that the price premium associated to biodiesel is likely to continue.



IN-STATE PRODUCTION AND SUPPLY

As noted earlier, state fuel contractors are free to acquire biodiesel from any supplier. When the fuel contracts were bid in 2005, there was only one “major” Washington-based commercial biodiesel producer. Today there are four in-state biodiesel producers that have expressed interest in state contract business. A number of fuel contractors have reported that they have been relying on mostly out-of-state biodiesel producers/suppliers because the comparatively low volume does not justify the risk associated in utilizing an untested supplier. The *good news* is that through GA’s outreach efforts, we are now starting to see state contractors cultivate business alliances with local biodiesel producers as quality and price become more competitive.

By utilizing both locally produced and out-of-state biodiesel, state fuel contractors have successfully implemented a biodiesel program on the west side of the state. Except for remote delivery locations and very small delivery quantities (less than 300 gallons of total fuel), these contractors have been able to deliver whatever blend of biodiesel is requested by state agencies. However, many fuel contractors have yet to implement a biodiesel program to capture the 6% biodiesel market potential of Eastern Washington. A new Eastern Washington biodiesel production facility recently opened, offering hope that existing supply chain concerns may be short-lived. Moreover, industry advancements suggest that many of the challenges related to

cold-weather use of biodiesel may also be resolved by adopting a more updated biodiesel specification specially formulated for winter months. Additionally, biocides can be added to biodiesel to combat the microbes that can cause filter clogging.

MARKET RESEARCH AND OUTREACH

During June of 2009, the GA contract administrator toured Inland Empire Oilseeds (in Odessa) and Gen-X Energy Group. Both companies produce biodiesel (i.e. B100) from feedstock acquired in Washington. These firms market their products to Washington customers, and our site visits have helped GA better understand the challenges and opportunities for penetrating the Washington state biodiesel market.

BIODIESEL FORUM

On September 10, 2009 GA hosted a biodiesel forum that brought together stakeholders representing fuel purchasers, biodiesel producers, fuel distributors, fuel terminal wholesalers, governmental policy makers, and other relevant contributors. Attendees were able to discuss impediments to increasing the use of biodiesel by governmental purchasers and identify strategies to overcome those impediments. A frank yet fruitful discussion ensued, and concluded on a note of cautious optimism regarding the future of Washington's biodiesel industry. Key findings include:

Fuel Purchasers:

- Budgetary pressure is a predominant factor influencing biodiesel purchasing decisions.
- The still evolving supply chain infrastructure is also impeding biodiesel adoption rates.
- Biodiesel gelling concerns prompt lower biodiesel blending ratios in cold climates.
- Expect an increase in filter clogging and maintenance at the onset of biodiesel.
- Olympia's Intercity Transit, a long-term user of biodiesel (B5 to B40), reported that they have not experienced engine manufacturer warranty issues related to the use of biodiesel, which has been a concern of many.

Industry claims:

- A B20 mandate that lacks enforcement and clarity is keeping fuel wholesale terminals from making the much needed infrastructure investments and improvements.
- Until a B20 blend is reliably available at fuel wholesaler terminals, biodiesel will not have a viable market in Washington.
- In-state biodiesel producers are manufacturing product that meets or exceeds ASTM specifications.
- Adoption and adherence to a more current and enhanced biodiesel specification would likely:
 - Remedy consistency of quality concerns that beleaguered some early adopters.
 - Resolve cold weather issues when enhanced with a specification formulated for winter.
 - Open the door for the use and mixture of different feed stocks.

- Be more confidently integrated into the wholesaler terminal infrastructure from multiple supply sources.
- Minimize industry concerns surrounding the co-mingling of different biodiesel varieties.
- There may be more accurate biodiesel price indexes today than what the state adopted in 2005.

Fuel distributors indicate that they must overcome an array of additional challenges in order to supply biodiesel to include:

- Some fuel terminal wholesalers are requiring fuel distributors to sign a waiver transferring liability risks to the fuel distributor for biodiesel blends that exceed 5%.
- Because of the solvent characteristic of biodiesel, engine malfunctions may incur absent proper preparation of equipment and storage when first implemented.
- Injection blending is a recognized best practice but is best applied at wholesale fuel terminals, as it is not cost effective for fuel distributors to implement.
- Since biodiesel blend ratios above 5% are not yet readily available at wholesale fuel terminals, for fuel distributor to supply a B20 blend means they must store B100 and then implement the less desirable splash blending technique.
- Unlike diesel, biodiesel has an estimated six month shelf life which can be problematic for those who house large capacity storage reserves.
- Requiring biodiesel to be sourced via BQ9000 certified producers may ensure adherence to predefined processes, but it does not necessarily ensure reliable quality and may stifle producer innovation and economies.
- Volume commitment is the currency industry needs to affect widespread change, but it is not lawful for GA to make volume commitments on behalf of the breadth of clients they serve.
- Typically, wholesale fuel terminals inject and control the red dye that denotes the tax exempt fuel the state regularly purchases, which becomes problematic when fuel distributors must assume the role of a blender in order to supply the state with B20.
- Because biodiesel is more susceptible to climate conditions, biocides and other chemical additives are needed and storage tanks may need to be insulated to protect against the adverse effect of cold weather.

Department of Agriculture reports:

- Testing throughout the state reveals that the biodiesel conforms to the required ASTM specification.
- Based on testing biodiesel testing experience, injection blending is preferred.

BIODIESEL FORUM RECOMMENDATIONS:

At the conclusion of each discussion point, participants were prompted to offer recommendations which included:

- The state should consider revising B20 biodiesel legislation that includes enforcement and promotes meaningful volume commitments such that:
 - WSF volume is not exempt from the B20 requirement.
 - Fuel wholesales have the motivation to upgrade their terminals to support a B20 blend.
 - The use of a more current and uniform biodiesel specification will facilitate the purchase and integration of locally produced biodiesel into fuel wholesale terminals.
 - Fuel distributors will no longer need to assume the role of a biodiesel blender.
 - Fuel wholesalers and purchasers at large can be assured that commercially available biodiesel conforms to the uniformly adopted biodiesel specification.
- Prior to rebidding the existing fuel contracts, GA should consider:
 - Making available on contract a more current and enhanced biodiesel specification that allows for multiple variations of feedstocks.
 - Utilizing an alternate biodiesel contract price calculation index that more closely tracks to true market pricing.
 - Reviewing contractor biodiesel pricing, and renegotiate price improvements where appropriate and possible.

Next steps: GA is meeting with key stakeholders in mid-October '09 to investigate the viability of these recommendations. The outcome of these meetings and next steps to improve GA's contract will be updated in the next biodiesel report.