IMPLEMENTING THE MINIMUM RENEWABLE FUEL CONTENT REQUIREMENTS

Washington State Biofuels Advisory Committee Report to the Director of the Washington State Department of Agriculture as required by Engrossed Substitute Senate Bill 6508 (2006)

AUGUST 2007

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August 20, 2007

Director Loveland,

On behalf of the Biofuels Advisory Committee, thank you for the opportunity to consider the important issues around the emerging biofuels industry in Washington State. The Committee took seriously its challenge to develop recommendations around successful implementation of the state's renewable fuel use standard and rapid development of a biofuels industry.

In preparing this report the Committee consulted widely and included peer review, broad stakeholder input, and public comment. I would like to thank those participants for their excellent cooperation in assisting the Biofuels Advisory Committee.

The Committee believes that Washington State should implement its two percent minimum renewable fuel content requirement for biodiesel and fuel ethanol on November 30, 2008 and December 1, 2008, respectively. In its initial report, the Committee limited recommendations to those it believes:

- Address the most immediate challenges to successful implementation of the RFS in 2008.
- Present the greatest opportunity for positive impact prior to implementation.

The Committee trusts its recommendations will help create a thriving, sustainable biofuels industry in Washington State; and its members are pleased to present to you this Biofuels Advisory Committee Report.

Sincerely,

Jeff Canaan
Bioenergy Coordinator
Washington State Department of Agriculture

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PART I

BIOFUELS ADVISORY COMMITTEE

PURPOSE

The Biofuels Advisory Committee was established by Governor Gregoire and the Legislature as part of the effort to develop a biofuels industry in Washington State. Leaders recognized the challenges of growing a new industry to complement both the existing fuel delivery system and the wide range of affected Washington industries. Consequently, they charged the Committee with offering advice to the Director of Agriculture on implementing or suspending the minimum renewable fuel use standard (RFS).

As described in statute, the Committee's recommendations consider logistical, technical, and economic issues of RFS implementation. In addition, the Committee will make recommendations to the Legislature and Governor on how the use of renewable fuel blends greater than two percent and renewable fuels other than biodiesel or ethanol could help achieve the goals of Engrossed Substitute Senate Bill (ESSB) 6508 (2006). The Biofuels Advisory Committee membership is described in Appendix A.

GUIDING PRINCIPLES

The Biofuels Advisory Committee and this report are guided by the goals of ESSB 6508 (2006), established by Governor Gregoire and the Washington State Legislature for the development of a biodiesel industry. Guiding principles include:

- Establish a market for alternative fuels in Washington.
- Reduce dependence on imports of foreign oil.
- Improve the health and quality of life for Washingtonians.
- Stimulate creation of a new industry in Washington that benefits our farmers and rural communities.

PART II

EXECUTIVE SUMMARY

STATE LEADERSHIP

Since 2000 Washington State has worked to diversify its fuel supply by exploring natural gas and hybrid vehicles, and biofuels. Washington's state agencies, fleets, industries and citizens were early adopters of biofuels and have worked to coordinate the wide range of implementation issues from air quality and agricultural production to permitting and taxation. In 2006, Governor Gregoire and the Legislature prepared the state to play a central role in supporting a biofuels industry in order to:

- Establish a market for alternative fuels.
- Reduce dependence on imports of foreign oil.
- Improve the health and quality of life for Washingtonians.
- Create a new industry in Washington that benefits our farmers and rural communities.

To achieve these goals and support a new biofuels industry in Washington, leadership established:

- A state-wide minimum renewable fuel use standard (RFS) for ethanol and biodiesel, ensuring a growing renewable fuels market in the state. Two percent of all diesel fuel sold in the Washington must be biodiesel by November 30, 2008. Two percent of all gasoline sold in the state must be must be ethanol by December 1, 2008.
- An aggressive RFS for state agencies. Effective June 1, 2009, 20 percent of all diesel purchased by state agencies must be biodiesel.
- The Energy Freedom Program. The program distributed $13 million in low interest loans in fiscal year 2007 to support vital biofuels infrastructure.
- Nationally-recognized biofuels quality and labeling standards to support consumer confidence in new fuels.
- The Biofuels Quality Assurance Program. The program helps ensure quality biofuels in the marketplace and makes biofuels quality testing a central component of the WSDA Motor Fuel Quality Program.
- The Biofuels Advisory Committee. The Committee supports broad stakeholder input to implementation of the RFS.

Taken together, these measures demonstrate the state's dedication to well-considered, successful implementation of the two percent RFS in Washington.

BIOFUELS ADVISORY COMMITTEE RECOMMENDATIONS

The Biofuels Advisory Committee and this report are tangible expressions of the state's commitment to biofuels in Washington. The report reflects the expertise of Committee members communicated through numerous discussions, as well as peer review, broad stakeholder input, and public comment. In its preparation of this report, the Committee deliberated on a broad range of issues, including environment, fuel quality, in-state feedstock, industry infrastructure, markets, and public policy. For its initial report to the Director of the Washington State Department of Agriculture (WSDA), the Committee limited its recommendations to the most immediate challenges to successful implementation of Washington's two percent RFS in late 2008. The Committee is expected to address other issues, including potential alternatives to biodiesel and ethanol, in upcoming reports. The Committee recognizes that any changes to RFS legislation prior to the 2008 implementation date may call for reassessment of the recommendations in this report.

RECOMMENDATION ON IMPLEMENTING OR SUSPENDING WASHINGTON'S RFS

Under current state law Washington's biodiesel RFS is to be implemented on November 30, 2008 and Washington's fuel ethanol RFS on December 1, 2008.[1] The Committee acknowledges the two implementation dates but, for convenience, uses only the December 1, 2008 date in this report.

The Biofuels Advisory Committee supports the efforts of Governor Gregoire and the Legislature to establish a biofuels industry in Washington. The Committee also believes that, because of those efforts, the state is well-positioned for successful implementation of a two percent RFS. Therefore, the Committee recommends implementation of the two percent RFS for fuel ethanol and biodiesel on December 1, 2008.

RECOMMENDATIONS FOR SUCCESSFUL IMPLEMENTATION OF WASHINGTON'S RFS

The following recommendations address the most pressing challenges to successful implementation of the state's two percent RFS by December 1, 2008. A narrative description of these issues is offered in Part IV of this report.

1 RCW 19.112.110 and RCW 19.112.120.

RECOMMENDATION #1: FUEL QUALITY

The Biofuels Advisory Committee considers the manufacture and sale of high quality biofuels to be essential to successful implementation of the RFS and recommends:

- Ongoing support of the WSDA Motor Fuel Quality Program monitoring and education/ outreach efforts on the wide range of fuel quality issues, including winter operability.
- Meaningful monitoring and enforcement to ensure quality biofuels in the marketplace.
- Annual reporting of motor fuel quality in the state by the WSDA Motor Fuel Quality Program.

RECOMMENDATION #2: FEEDSTOCK AGRONOMICS

The Biofuels Advisory Committee believes that solutions to feedstock agronomic challenges are necessary to achieve the goals of ESSB 6508 (2006) and recommends:

- Protection of existing financial support for short-term, applied feedstock crop research by agronomic zone and consideration of broader programs.
- Support for expanded cooperative efforts between WSDA and WSU to effectively communicate research results and recommendations to Washington State producers.

RECOMMENDATION #3: FEEDSTOCK ECONOMICS

The Biofuels Advisory Committee believes that solutions to feedstock economic challenges are necessary to achieve the goals of ESSB 6508 (2006) and recommends:

- Consideration of federal and/or state support and incentive programs to aid profitable biofuels feedstock crop production systems. Programs might include crop price incentives or insurance premium assistance.
- Support for expanded, cooperative outreach and education efforts by WSDA and WSU to communicate crop economic information to producers, including WSU efforts to establish quality economic data for oilseed crop production.
- Establishment of oilseed feedstock adaptability data to support crop insurance availability in all appropriate counties. WSU has the expertise to establish the required data.

PART III

THE CASE FOR IMPLEMENTATION: WASHINGTON STATE BIOFUELS STATUS REPORT

GOVERNMENT PROGRESS: USE, ASSISTANCE AND OVERSIGHT

State agencies already use ethanol in the form of blended gasoline and they are laying groundwork for increased biodiesel use. In 2006, the Department of General Administration (GA) began planning for increased biodiesel procurement and tracking within state agencies. GA plans for increased biodiesel procurement continue despite recent challenges.[2] In 2004, Washington State Ferries (WSF) began a pilot test of biodiesel, but due to filter clogging problems WSF suspended the project in June 2005. In 2007, WSF and Puget Sound Clean Air Agency convened a team of fuel and marine experts to address filter clogging problems and reimplement B20 biodiesel use in the ferry system. As the largest ferry system in the United States, WSF could use as much as 4 million gallons of B100 biodiesel annually. Together, state agencies must use 20 percent biodiesel annually by June 2009 (approximately 5 million gallons of B100 biodiesel). Continuing work by these agencies will make the mandate a reality.

The state's Energy Freedom Program assists renewable and clean energy projects in Washington. In the 2007 fiscal year, WSDA completed agreements to disburse $13 million in low interest loans for biofuels/bioenergy infrastructure projects. A total of nine loans were awarded to five projects: three integrated oilseed crushing/biodiesel production projects, one oilseed crushing project, and one anaerobic digester bioenergy project. WSDA will administer these loans, monitor project progress, and ensure loan repayment. The Department of Community, Trade and Economic Development (CTED) will administer all future program efforts.

WSDA's Motor Fuel Quality Program tests motor vehicle fuels, ensures appropriate consumer labeling, and provides fuel quality oversight. In February 2007, the program adopted rules for consumer labeling of biofuels products at the retail pump. The program also adopted nationally-recognized ASTM quality standards for fuel ethanol used as blend stock with gasoline, biodiesel used as blend stock with petroleum diesel, and E85 fuel

2 Since March 2007, Internal Revenue Service (IRS) application of biodiesel blend dye requirements has hindered availability of dyed biodiesel to state fleets. Product dyed to IRS specification is now available in limited areas, and agency use of biodiesel is expected to increase accordingly. GA is working cooperatively with other agencies to find a statewide solution to IRS dye policy.

blends.[3] WSDA samples fuels to ensure that gasoline, petroleum diesel, fuel ethanol and biodiesel products meet appropriate quality specifications. The state supported meaningful enforcement of these standards by funding biofuels testing, and WSDA inspectors began sampling biofuels in July 2007. The program's extensive fuel testing will seek to identify poor quality fuels by sampling fuels at all points of the distribution system—from producer to pump—and is expected to be among the most proactive in the nation. As part of the program, staff will conduct education and outreach to biofuels marketers/distributors, retailers and the public regarding the state's quality and labeling requirements.

The Washington State Department of Licensing (DOL) is responsible for tracking biofuels sales in Washington State, providing aggregate data for RFS administration and implementation. Prior to July 2007, the DOL fuel tax database was incapable of tracking ethanol, biodiesel, dyed biodiesel, and dyed petroleum diesel transactions separately. The agency revised its system to support detailed reporting of biofuels and added disbursement reporting capability for these products in July 2007. DOL expects to begin implementation on September 1, 2007 with full implementation by November 30, 2007. As required by statute, DOL will report fuel ethanol data quarterly and biodiesel data annually.[4]

WSDA is working with the Washington office of the National Agriculture Statistics Service (NASS) and the Farm Service Agency (FSA) to gather the feedstock data required for RFS assessment and administration. Currently, NASS does not report oilseed information for Washington State.[5] Until all feedstock data is routinely reported by NASS, WSDA will use FSA oilseed crop data and/or contract with NASS for targeted producer surveys. Together, these data points will ensure that WSDA accurately assesses feedstock production in Washington.

FEEDSTOCK: GROWN IN WASHINGTON

Biofuels feedstock development in Washington varies dramatically according to the fuel in question. While potential sources for ethanol production are well-developed due to Washington's storied history of grain production, oilseed crop production is just beginning.

Washington farmers have substantial experience with feedstock for contemporary ethanol processes, including wheat, barley and corn. In 2006, for example, Washington farmers harvested 2.2 million acres of wheat (140,050,000 bushels), representing approximately 384 million gallons of ethanol potential.[6] Producers are expected to match that harvest in 2007. In addition, Washington growers planted 220,000 acres of barley in 2007, a 16 percent

3 Washington Administrative Code (WAC) 16-662-105 and WAC 16-662-115.

4 RCW 19.112.110 and RCW 19.112.120.

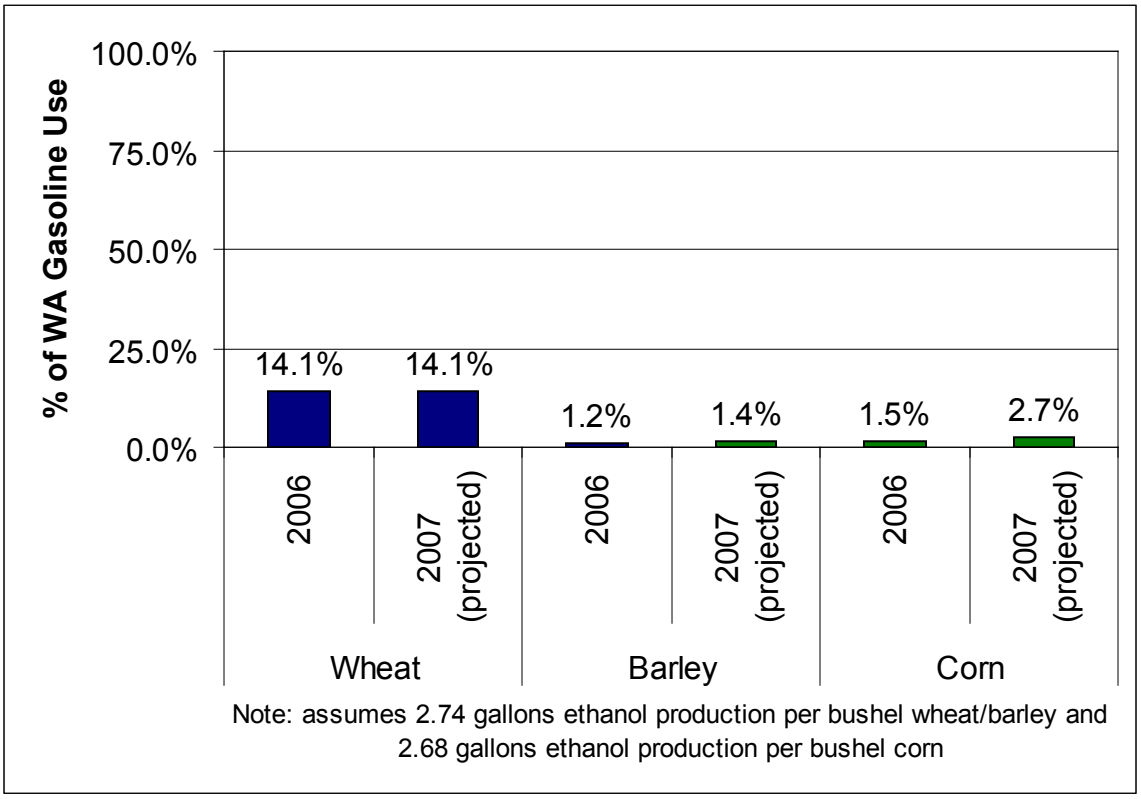
5 WSDA periodically requests state level statistics (acres planted, harvested and production) for canola and other oilseeds. Currently, survey sample size does not meet NASS guidelines for statistical reliability, so data is not publicly available. WSDA continues to work with NASS to improve data quality and availability.

6 *Small Grains 2006 Summary*, National Agricultural Statistics Service, United States Department of Agriculture, Washington DC, 20250, September 2006.

Assumes a conservative conversion rate of 2.74 gallons ethanol/bushel of wheat. *The Economics of Producing Energy Crops*, United States Department of Agriculture, Shapouri and Duffield, 2002.

increase from 2006.[7] Although Washington's corn production pales in comparison to its wheat harvests, acreage in the state is on the rise. In 2006, 75,000 acres of corn were grown for grain with an average yield of 210 bushels per acre.[8] NASS estimates 130,000 acres of corn will be harvested for grain in 2007, a 58 percent increase.[9] Washington can reasonably expect a yield of 27,300,000 bushels of corn (approximately 73,000,000 gallons of ethanol potential) in 2007.[10] The state's corn crop alone might supply 2.7percent of Washington's gasoline needs (Figure 1).[11]

Figure 1: Ethanol Potential from Washington Grain Production



In contrast to grain crops, Washington farmers have limited experience with oilseeds such as canola, rapeseed, mustard, sunflower and soybean. In 2006, for example, canola/

7 *Agri-facts*, National Agricultural Statistics Service, United States Department of Agriculture, Washington DC, 20250, Washington Field Office, Olympia, WA 98507, April 4, 2007.

Small Grains 2006 Summary, National Agricultural Statistics Service, United States Department of Agriculture, Washington DC, 20250, September 2006.

8 *Agri-facts*, National Agricultural Statistics Service, United States Department of Agriculture, Washington DC, 20250, Washington Field Office, Olympia, WA 98507, April 4, 2007.

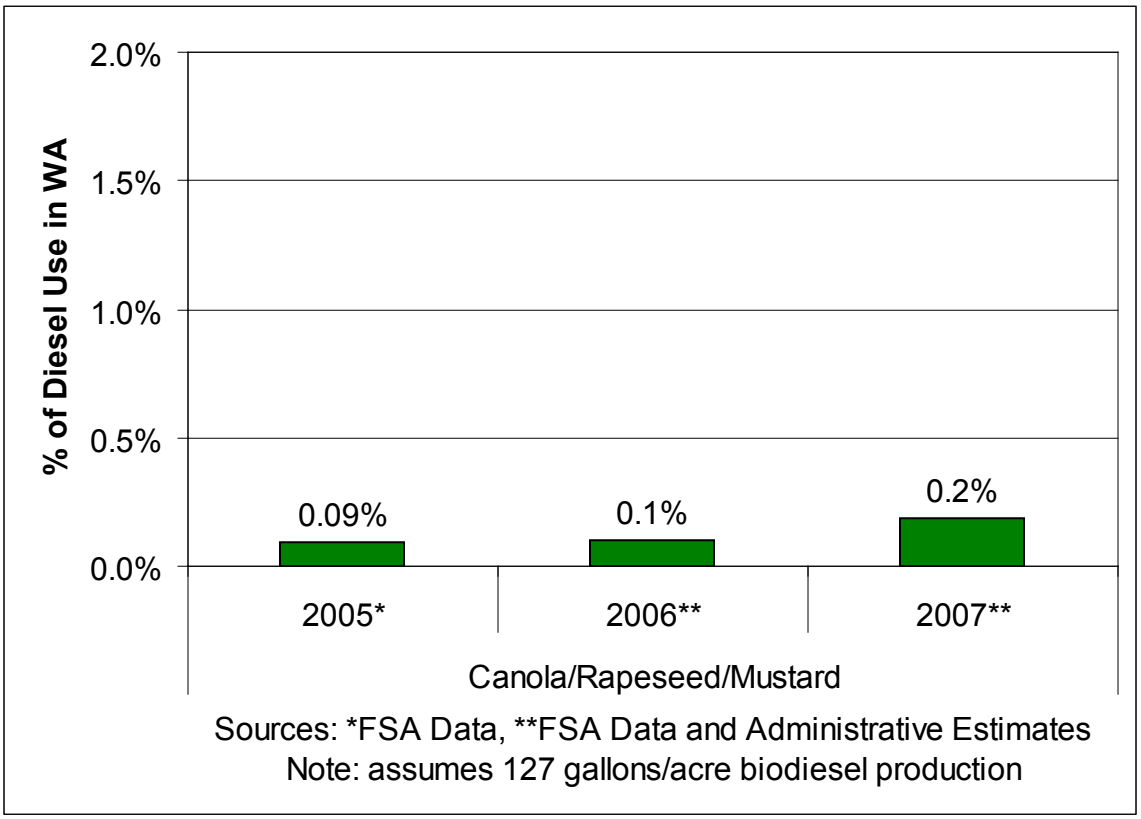
9 Press Release, National Agricultural Statistics Service, United States Department of Agriculture, Washington DC, 20250, Washington Field Office, Olympia, WA 98507, June 29, 2007.

10 Assumes a conservative figure of 2.68 gallons ethanol/bushel of corn. *2002 Ethanol Cost-of-production Survey*, United States Department of Agriculture, Agricultural Economic Report Number 841, Shapouri and Gallagher, July 2005.

11 According to State Department of Licensing figures, Washingtonians used 2,730,166,926 gallons of gasoline in 2005.

rapeseed/mustard production in the state was approximately 9,500 acres.[12] 2006 production represents about 1,200,000 gallons of biodiesel, or 0.1 percent of the petroleum diesel sold in Washington.[13] Farm Service Agency (FSA) data suggest a near doubling of canola/rapeseed/mustard acreage in 2007, representing about 2,300,000 gallons of biodiesel.[14] Despite increasing acreage, Washington oilseed production supports just 0.2 percent of annual diesel consumption in the state (Figure 2).

Figure 2: Biodiesel Potential from Washington Canola/Rapeseed/Mustard Production



Because oilseed crops are expected to be grown in rotation with mainstay crops such as wheat, it will take several years for in-state oilseed production to increase substantially. However, important action to boost oilseed production is already underway. In 2007, Washington State University (WSU) and WSDA partnered to support $2 million in short-

12 Source: USDA Farm Service Agency (FSA). FSA data reflect acres reported by producers for crop certification purposes. Actual acres planted are typically higher. FSA reported 7,127 acres of canola, rapeseed and mustard in 2006. Administrative estimates raise that number to 9,500 acres.

13 Assumes biodiesel production of 127 gallons per acre. *BioFuel Variety Trials Fact Sheet*, USDA-Agriculture Research Service and WSU-Prosser, Harold P. Collins, An Hang, et. al.

According to State Department of Licensing figures, Washingtonians used 1,214,813,180 gallons of diesel fuel in 2005.

14 FSA reports 13,675 acres of canola, rapeseed, and mustard in Washington State. Administrative estimates raise that number to approximately 18,000 acres. Fuel representation assumes 127 gallons/acre biodiesel production.

term, applied research on alternative crops for both biodiesel and ethanol. Oilseed crops slated for evaluation include canola/rapeseed, mustard, safflower, winter lupin, camelina, flax, sunflower, and soybean. The effort includes agronomic evaluation of various canola varieties for Washington microclimate, rainfall and soil-type variations. Early trial results have bolstered producer interest:

- Oilseed crops grown in rotation with wheat show significant rotational benefits, including wheat yield gains of approximately 20 percent.[15]
- Significant camelina plantings in Montana demonstrated that crop's potential for Washington dry land farmers.
- Western Washington canola trials demonstrated tremendous yield potential.[16]

To support oilseed production while protecting other important agricultural industries, WSDA was granted authority to establish rules for orderly production of potentially incompatible varieties of *brassicas* seed crops (e.g., canola and cabbage). For the vegetable seed industry, these rules will decrease the potential for genetic crosses and associated loss of quality, purity, and value of the seed produced. For oilseed producers, the rules will clarify cropping opportunities.

At present, Washington's oilseed industry makes limited contributions to implementation of the RFS. However, improving agronomic and economic information as well as preventing industry conflicts supports opportunities for Washington feedstock growers.

INFRASTRUCTURE: PRODUCED IN WASHINGTON

A survey of proposed renewable fuel projects in Washington suggests a burgeoning biofuels industry: ethanol production, oilseed crushing and biodiesel production capacities all show recent, dramatic increases.

Currently, Washington has no operational ethanol facilities, but projects in the planning and permitting stages represent 566 million gallons per year of production capacity, or 18 percent of Washington's gasoline annual consumption (Figure 3).[17]

15 *Economics of Canola Production for Washington State: Economic analysis of interviews with current dryland and irrigated producers*, WSU Center for Sustaining Agriculture and Natural Resources, Kathleen Painter.

16 2006 trials in Snohomish County reached targets of 4,000-4,500 pounds per acre with 40 percent oil yield. *Biodiesel Seed Crop Report, Phase I*, Sno/Sky Agricultural Alliance, March 2007.

17 *Biofuels Development in Washington*, WSU Energy Extension, Kim Lyons, June 30, 2007.
According to State Department of Licensing figures, Washingtonians used 2,730,166,926 gallons of gasoline in 2005.

Figure 3: Proposed Ethanol Production Facilities in Washington

Oilseed crushing capacity may be the linchpin of an in-state biodiesel industry, providing an outlet for regional oilseed crops and reliable oil supply for regional biodiesel producers. Currently, Washington has over 8,000 tons per year of operational oilseed crushing capacity. Three large-scale facilities under development will add 736,000 tons per year of crushing capacity by the end of 2008 (Figure 4).[18] In total, Washington's oilseed crushers might produce sufficient oil for over 65 million gallons of biodiesel annually (over six percent of Washington's diesel needs).[19]

Like production and crushing capacity, Washington's emerging biofuels marketplace is expanding. In 2004, Washington's ethanol consumption was approximately 68 million gallons (2.5 percent of the gasoline sold).[20] Current ethanol use is believed to be similar to 2004 levels. In addition, the state's first public-access E85 pumps were installed in 2007. It is expected that fuel ethanol consumption in the state will continue to satisfy the two percent RFS, primarily due to discretionary ethanol blending by the petroleum industry.

18 *Biofuels Development in Washington*, WSU Energy Extension, Kim Lyons, June 30, 2007.

19 Assumes an estimate of 90 gallons biodiesel per ton of canola seed.

20 Source: Energy Information Administration.
According to Department of Licensing figures, Washingtonians used 2,730,166,926 gallons of gasoline in 2005.

Figure 4: Proposed and Operating Oilseed Crushing Facilities

Washington's current biodiesel production capacity is approximately 122 million gallons per year from nine facilities, representing 12 percent of diesel consumption in the state. An additional 180 million gallons of production capacity is in the planning or permitting stage (Figure 5).[21] Extensive in-state biofuels production will support reliable, regional supplies of renewable fuels well beyond the requirements of Washington's two percent RFS.

MARKETS: BENEFITING WASHINGTON

Over the last four years, biodiesel consumption in Washington increased from a few thousand gallons to millions of gallons per year (Figure 6). Preliminary data indicate Washingtonians will use over 12 million gallons of B100 biodiesel in 2007, putting the state well on its way to meeting the RFS requirement.[22] Increasing biodiesel use by state agencies, particularly the Department of Transportation (DOT), will help move Washington toward RFS success. Consistent with Washington's rapid adoption of biodiesel, municipal/fleet use continues to grow and the number of retail locations in the state increased from approximately 20 in 2005 to 50 in July 2007.[23]

21 *Biofuels Development in Washington*, WSU Energy Extension, Kim Lyons, June 30, 2007.

22 Data from informal survey of biodiesel distributors, WSDA Weights and Measures Program, July 2007. According to Department of Licensing figures, Washingtonians used 1,214,813,180 gallons of diesel fuel in 2005. A two percent RFS will require approximately 24 million gallons of B100 biodiesel annually.

23 *Biodiesel in Washington: A Snapshot*, Washington State University Energy Program, John Kim Lyons, May 2005. *WSDA Motor Fuel Quality Program Field Survey*, Washington State Department of Agriculture, Mike Mann, July 2007.

Figure 5: Proposed and Operating Biodiesel Production Facilities

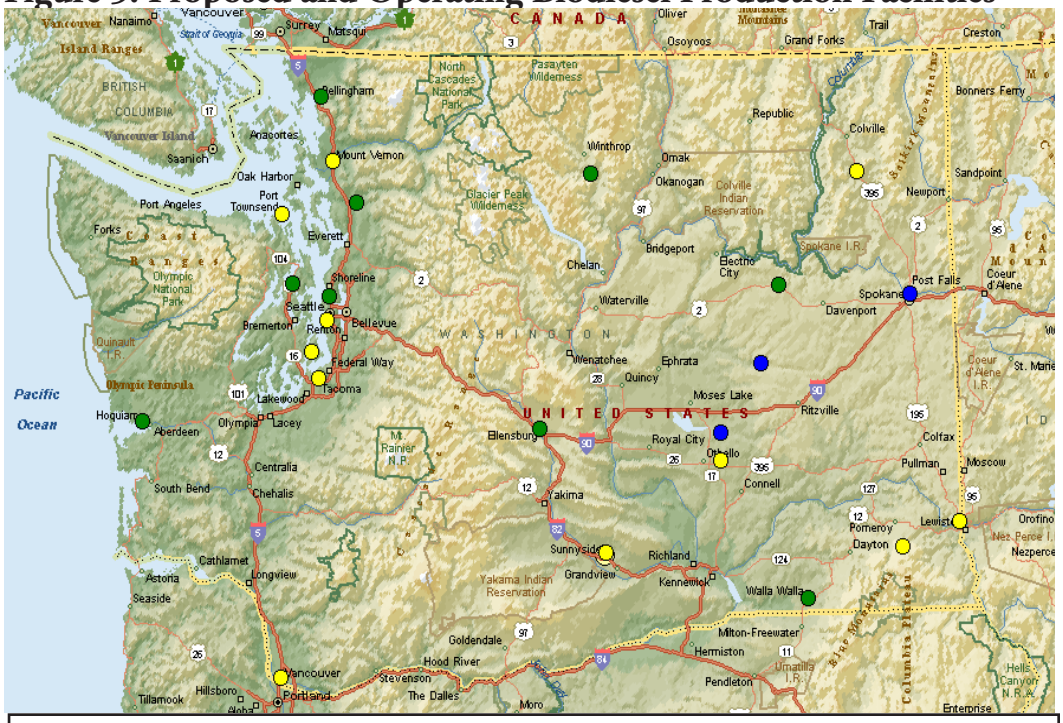
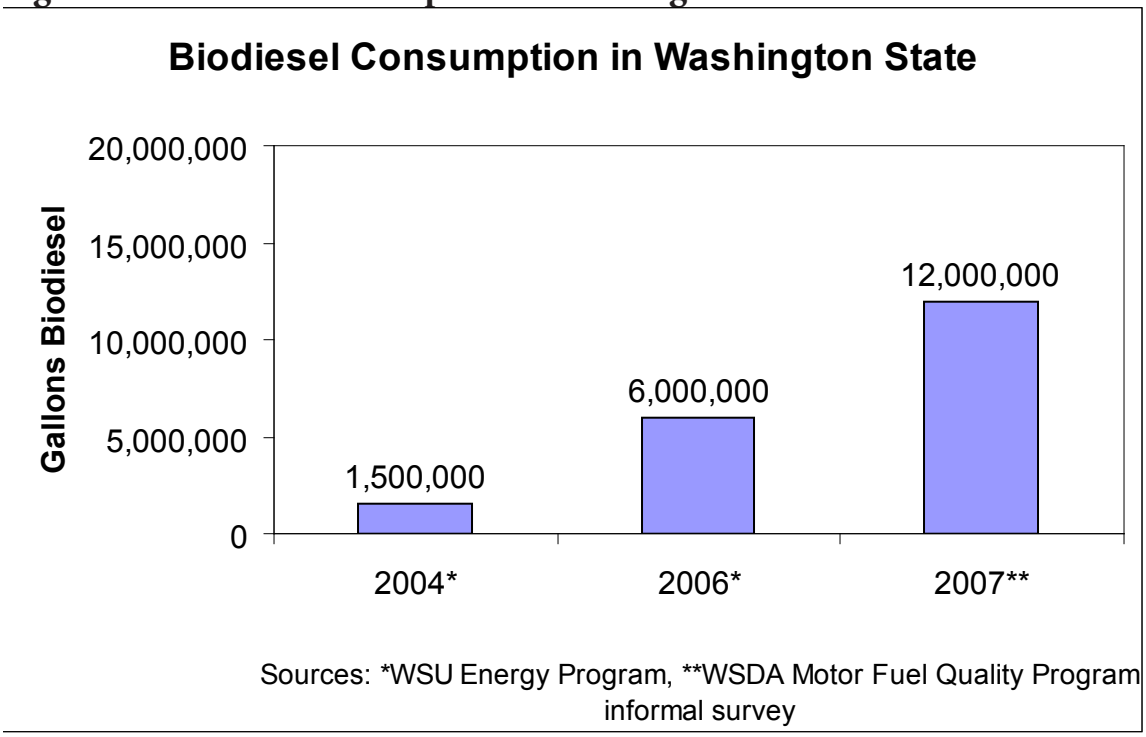


Figure 6: Biodiesel Consumption in Washington State



Washington's Governor and Legislature continue to address biofuels market needs proactively. In 2007, they tasked WSU with assessing market incentives to encourage in-state production of brassica-based biodiesel and cellulosic ethanol, including such measures as direct grants and production tax credits. Leaders charged CTED with overseeing plans for production, transport, distribution, and delivery of biofuels from recycled products or Washington-grown feedstock. As administrator of the Energy Freedom Program, CTED will recommend appropriate mechanisms to help Washington farmers and businesses compete in the biofuels marketplace, including but not limited to changes in state contracting practices, tax incentives, and RFS provisions.[24]

Recommendation on Implementing or Suspending Washington's Renewable Fuel Standard

The Biofuels Advisory Committee believes that government action, combined with growing biofuels infrastructure and consumption, established the foundation for a viable biofuels industry in Washington. The Committee supports the efforts of Governor Gregoire and the Legislature to establish a biofuels industry in Washington. The Committee also believes that, because of those efforts, the state is well-positioned for successful implementation of a two percent renewable fuel standard. Therefore, the Committee recommends implementation of the two percent renewable fuel standard for fuel ethanol and biodiesel on December 1, 2008.

24 Engrossed Second Substitute House Bill 1303 (2007).

PART IV

RECOMMENDATIONS FOR SUCCESSFUL IMPLEMENTATION OF WASHINGTON'S RFS

After deliberating on a wide range of logistical, economic and technical issues, the Biofuels Advisory Committee identified three critical areas for recommendation: fuel quality, feedstock agronomics, and feedstock economics. The Committee believes that the following recommendations:

- Address the most immediate challenges to successful implementation of the RFS on December 1, 2008.
- Present the greatest opportunity for positive impact prior to December 1, 2008.

FUEL QUALITY: OFF-SPEC. FUEL

Successful implementation of the state's RFS will depend upon quality fuels in the marketplace. Like all fuels, ethanol and biodiesel present quality challenges. Although quality problems can arise from many sources, including temperature operability and poor blending, fuels that fail basic quality standards (i.e., off-spec. fuels) present a fundamental risk to RFS implementation in Washington. Typically, off-spec. fuels result from improper fuel production or careless fuel handling. Consequences of these products range from minor filter plugging to premature engine failure, and may severely undermine consumer confidence.

Improperly produced biofuels are present in the marketplace. In 2005, Minnesotans witnessed vehicle inoperability related to imprecisely produced biodiesel, resulting in suspension of that state's RFS.[25] But fuel quality issues aren't always as obvious as stalled vehicles: National Renewable Energy Laboratory (NREL) biodiesel surveys in 2004 and 2006 demonstrated an abundance of off-spec. biodiesel in the marketplace despite the absence of widespread complaint. Most off-spec. biodiesel in the 2006 survey was due to substandard fuel production.[26]

25 *Recommendations to Minnesota Department of Commerce*, National Biodiesel Board and Minnesota Biodiesel Council, January 11, 2006.

26 Samples in the 2006 survey had a failure rate of 59 percent compared to the specification. Of the off-spec. samples, 33 percent failed to meet the glycerin specification and 30 percent failed to meet the flash point specification. *2006 B100 Quality Survey Results*, Milestone Report NREL/TP-540-41549, T.L. Alleman, R.L. McCormick, and S. Deutch, May 2007.

Survey of the Quality and Stability of Biodiesel and Biodiesel Blends in the United States in 2004, Technical Report NREL/TP-540-38836, R.L. McCormick et al., October 2005.

Even well-produced fuels quickly become off-spec. products when handled improperly. Both ethanol and biodiesel are biodegradable compounds. From an environmental perspective, biodegradability has many benefits, but these fuels will rapidly degrade under inferior storage conditions. Ethanol and biodiesel are particularly susceptible to water contamination and associated microbial growth. In the 2006 NREL survey, 69 percent of biodiesel samples exceeded 500 ppm water content, and one obvious source of water contamination is improper handling/storage. As with petroleum fuels, biocide and antioxidant additives dramatically increase the durability of biofuels, but they cannot replace proper fuel handling practices.

Localized vehicle inoperability is an obvious potential consequence of badly produced or handled biofuels. However, an eventual consequence of off-spec. biofuels is loss of consumer confidence, and retail and export markets. The Committee commends Washington's proactive Motor Fuel Quality Program, which will diminish the likelihood of fuel quality problems in the marketplace and help identify poor fuel handling practices. In addition, the Committee believes program plans for education and outreach to the industry and public are vital to RFS success. Nonetheless, the Committee is convinced that management of quality issues remains a critical component of RFS implementation.

Fuel Quality Recommendation

The Biofuels Advisory Committee considers the manufacture and sale of high quality biofuels to be essential to successful implementation of the renewable fuel standard and recommends:

- Ongoing support of the Washington State Department of Agriculture Motor Fuel Quality Program monitoring and education/outreach efforts on the wide range of fuel quality issues, including winter operability.
- Meaningful monitoring and enforcement to ensure quality biofuels in the marketplace.
- Annual reporting of motor fuel quality in the state by the WSDA Motor Fuel Quality Program.

IN-STATE FEEDSTOCK: AGRONOMICS AND ECONOMICS

Currently, all fuel ethanol in Washington State is imported, and most biodiesel is imported as either finished fuel or raw feedstock for subsequent fuel production. Consequently, Washington State could satisfy its two percent RFS entirely through imported feedstock and finished fuels. However, substantial use of in-state feedstock is necessary if the state is to achieve the goals established by Governor Gregoire and the Legislature.

A viable, in-state feedstock industry will support jobs and economic vitality, particularly among farmers and rural communities. The agricultural sector has proven its value to the state's economy time and again, yet the magnitude of those benefits continues to surprise. Washington State's $32 billion per year agriculture industry comprises 12 percent of the state's economy and employs 160,000 people.[27] The economic benefit of a healthy biofuels feedstock and processing industry alone might be measured in billions of dollars annually.[28] Moreover, native feedstock production will provide abundant feed for Washington's livestock industry and displace a portion of foreign petroleum's $9 billion annual drain on the Washington economy.

Already, fuel ethanol producers can look to Washington farmers for high-quality grain feedstock with the benefits of lower transportation costs and reliable supply. This is not the case for biodiesel producers: despite increasing oilseed crushing, biodiesel production and biofuels consumption in Washington, oilseed production languishes. Biodiesel producers must import feedstock and face challenges of transportation costs and supply reliability. A thriving oilseed production and processing industry remains the missing element in the Washington biofuels portfolio. Consequently, the Biofuels Advisory Committee believes near-term action on feedstock agronomic and economic issues is vital to achieving the goals of ESSB 6508 (2006).

FEEDSTOCK AGRONOMICS

Washington farmers have over 130 years of crop experience growing grains. Wheat, barley, and corn varieties well-suited to Washington's micro-climates and soils are readily available and their agronomics well-understood. Washington State University (WSU) research continues to advance crop varieties and cropping practices for these staples of Washington agriculture and Washington grain production continues apace.

Oilseed crops are comparatively unfamiliar to Washington farmers. Risks associated with oilseed production are unclear, and refinements to plant/harvest techniques, nutrient inputs, soil management, and weed/pest control are only beginning. Despite recent efforts, farmers will remain hesitant, unwilling or unable to grow oilseed crops until fundamental agronomic information is well established and readily available. The Biofuels Advisory Committee believes development of agronomic information as well as education and outreach to Washington's farmers are necessary to achieve the RFS goals.

27 USDA National Agriculture Statistics Service, 2002 Census.

28 *Bioenergy Crops at Washington State University: Research, Demonstration and Outreach Efforts*, 1/13/2006.

Feedstock Agronomics Recommendation

The Biofuels Advisory Committee believes that solutions to feedstock agronomic challenges are necessary to achieve the goals of ESSB 6508 (2006) and recommends:

- Protection of existing financial support for short-term, applied feedstock crop research by agronomic zone and consideration of broader programs.
- Support for expanded cooperative efforts between WSDA and WSU to effectively communicate research results and recommendations to Washington State producers.

FEEDSTOCK ECONOMICS

As with agronomics, the suitability of crop economics varies by feedstock. The contemporary farm economy lends itself to grain production: landlords appreciate the predictability of grain yields/incomes, and extensive yield histories and crop programs for grains make insurance and operating loans readily available. Even more influential is the current high price for grains: between food, feed and ethanol markets, demand is high. Washington's increasing grain corn acreages is testament to attractive grain markets.[29]

While Washington farmers have expressed interest in adopting new crops, such as oilseeds, their economic viability is less certain. Most farms operate with some component of leased land, and landlords are more interested in guarantied returns from grains than taking risks on unproven crops. Agronomic tools will help farmers support yield predictability from new feedstock crops, but only production demonstration and/or quality economic evaluations will convince farmers and landlords of their viability.

Similarly, many producers depend on operating loans to farm. New crops lack yield histories and are frequently removed from an operation as a condition of loan authorization. The reluctance of bankers to loan on unproven crops such as oilseeds prevents Washington farmers from planting. Until farmers gain individual and/or regional experience with new feedstock crops, this dynamic will remain a serious challenge to in-state feedstock production.

Unavailability of crop insurance for feedstock crops such as oilseeds prevents farmers from planting these crops in Washington. USDA Risk Management Agency (RMA) supports Actual Production History (APH) insurance policies for canola/rapeseed in only

29 According to National Agriculture Statistics Service, Washington corn acreage increased 58 percent in 2007.

11 Washington counties.[30] Producers in counties without available policies may petition RMA for coverage by providing qualifying actual or proxy yields.[31] In many areas, however, required data is simply unavailable. Qualifying yield data take on added importance in the 2009 crop year when RMA expands canola/rapeseed coverage with "combo" policies providing yield and revenue protection to producers.[32] Without short-term support for insurance procurement, many producers will not grow new feedstock crops.

Profitability remains the ultimate challenge to feedstock production in the state. Historically, oilseed production has been a net-loss for farmers in our region. Price increases during the past year have made canola/rapeseed profitable; but the price improvements have not equaled all-time high commodity prices for wheat and corn. To compete with grains, producers will need quality economic evaluations, including consideration of rotational benefits and value-added opportunities. Without long-term economic incentive, it is unlikely that Washington producers will incorporate oilseed crops into their rotations.

Lack of leased land, operating loans, crop insurance or crop profitability prevent many farmers from planting oilseed crops in Washington each year. Until farmers gain experience with oilseeds and have clear economic understanding of oilseed profitability, economic issues will hinder achievement Washington's RFS goals.

Feedstock Economics Recommendation

The Biofuels Advisory Committee believes that solutions to feedstock economic challenges are necessary to achieve the goals of ESSB 6508 (2006) and recommends:

- Consideration of federal and/or state support and incentive programs to aid profitable biofuels feedstock crop production systems. Programs might include crop price incentives or insurance premium assistance.
- Support for expanded, cooperative outreach and education efforts by WSDA and WSU to communicate crop economic information to producers, including WSU efforts to establish quality economic data for oilseed crop production.
- Establishment of oilseed feedstock adaptability data to support crop insurance availability in all appropriate counties. WSU has the expertise to establish the required data.

30 USDA, Risk Management Agency, www.rma.usda.gov. The regional RMA field office in Spokane has responsibilities for Alaska, Idaho, Oregon, and Washington. Contact: David Paul, Director, Dave.Paul@rma.usda.gov, 509-228-6320.

31 For counties without APH coverage, RMA requires evidence that the canola is adapted to the county. Once RMA has verified adaptability of the crop to the county, the agency uses the producer's actual production history of a similar crop, such as wheat, to establish a proxy production history for canola.

32 *Federal Register, Vol. 71, No. 135*, Friday, July 14, 2006, Proposed Rules

Dramatic industry growth and rapid consumer acceptance of biofuels in Washington State give abundant support for implementation of Washington's RFS. State action on many challenges facing the industry established an excellent foundation for success, but active attention to the fundamental recommendations outlined above is essential. High fuel quality is a prerequisite to successful RFS implementation. Meaningful oversight by WSDA's Motor Fuel Quality Program and continued state support of that work will allow Washington to build upon its early biofuels achievements. Feedstock production remains the missing element in Washington's strategic efforts. Near-term attention to feedstock agronomics and economics is essential for full benefit and rapid achievement of Washington's RFS goals. The Biofuels Advisory Committee remains enthusiastic about the future of biofuels in Washington State and looks forward to successful implementation of the two percent RFS on December 1, 2008.

APPENDIX A:

BIOFUELS ADVISORY COMMITTEE MEMBERS

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Consumer Representatives:
David Overstreet, American Automobile Association
Mike Richardson, Puget Sound Energy
Larry Pursley, Washington Trucking Association

Biofuels Industry Representatives:
Todd Ellis, Imperium Renewables
Bill Riley, Big Bend Economic Development Council

Petroleum Industry Representatives:
H. Daniel Sinks, ConocoPhillips
David Smith, BP America

Education/Research Representatives:
Peter Moulton, Climate Solutions
Ralph Cavalieri, Washington State University
Dave Sjoding, Washington State University, Energy Extension

Feedstock Representatives:
Curtis Hennings, Spectrum Crop Development
Dennis Spangler, Connell Grain Growers
Jeffrey R. Stephens, Washington Biodiesel

Fuel Marketing and Distribution Representatives:
Gerry Ramm, Inland Oil Co.
Mark Tegen, Pacific Fluids, LLC

BIOFUELS ADVISORY COMMITTEE HONORARY MEMBERS

State Legislators:

Senator Janea Holmquist
Senator Marilyn Rasmussen
Representative Zack Hudgins

State Agency and University Representatives:

Melissa Ahern, Washington State University
Paul Brodeur, Department of Transportation/Ferries
Mark Fuchs, Department of Ecology
Julie Knittle, Department of Licensing
Tim Stearns, Department of Community, Trade and Economic Development
Steve Van Vleet, Washington State University

Federal Agency Representatives:

Chris Cassidy, USDA Rural Development
Dana Warn, EPA Region 10

County Representatives:

Jim Armstrong, Spokane County Conservation District
Terry Brewer, Grant County Economic Development Council
Jim Lopez, King County

APPENDIX B:

BIOFUELS ADVISORY COMMITTEE STATUTORY AUTHORITY

RCW 19.112.150 BIOFUELS ADVISORY COMMITTEE

The director shall establish a biofuels advisory committee to advise the director on implementing or suspending the minimum renewable fuel content requirements. The committee shall advise the director on applicability to all users; logistical, technical, and economic issues of implementation, including the potential for credit trading, compliance and enforcement provisions, and tracking and reporting requirements; and how the use of renewable fuel blends greater than two percent and renewable fuels other than biodiesel or ethanol could achieve the goals of chapter 338, Laws of 2006. In addition, the committee shall make recommendations to the legislature and governor on the potential to use alternatives to biodiesel, which are produced from nonpetroleum renewable sources (inclusive of vegetable oils and animal fats), to meet the minimum renewable fuel content requirement. The director shall make recommendations to the legislature and the governor on the implementation or suspension of chapter 338, Laws of 2006 by September 1, 2007.