REPORT OF THE
SECRETARY OF AGRICULTURE AND FORESTRY

Study of the Use and Production of Biodiesel Fuel in the Commonwealth

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

HOUSE DOCUMENT NO. 78

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Office of the Governor

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TO: The Honorable Mark R. Warner
Governor of Virginia
And
Members of the Virginia General Assembly

It is my privilege to present this report constituting the response to House Joint Resolution No. 598, which was approved in the 2005 Session of the General Assembly. The resolution requested that I study the use and production of biodiesel fuel in the Commonwealth.

I hope the information in this report will be useful as you develop policies concerning the use and production of biodiesel fuel in the Commonwealth. Please let me know if I can be of further assistance.

Respectfully submitted,

Robert S. Bloxom

Robert S. Bloxom
Secretary of Agriculture and Forestry

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PREFACE

This study was undertaken in response to House Joint Resolution No. 598, which requests that the Secretary of Agriculture and Forestry study the use and production of biodiesel fuel in the Commonwealth. Staff at the Virginia Department of Agriculture and Consumer Services and a Governor's Fellow provided assistance to the Secretary in the completion of this study. We wish to recognize the staff who contributed their time and expertise to this effort:

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EXECUTIVE SUMMARY

House Joint Resolution 598 requested that the Secretary of Agriculture and Forestry study the use and production of biodiesel fuel in Virginia paying particular attention to the capability and desirability of generating a minimum demand of 20 million gallons annually in the Commonwealth. The study resolution also requested that the Secretary consider several other issues that have been studied extensively by academia, several states, and local governments.

The Secretary and Deputy Secretary of Agriculture and Forestry formed a Biodiesel Workgroup consisting of staff from the Virginia Department of Agriculture and Consumer Services and a Governor's Fellow assigned to the Secretariat of Agriculture and Forestry. The Workgroup's study methodology included a listening session and a review of biodiesel studies conducted by academia, local government, and other states. Persons with expertise in specific topics outlined in the study resolution were invited to present information on the use and production of biodiesel in the Commonwealth. A public comment period followed the listening session to provide industry groups, advocacy groups and other interested parties an opportunity to share their thoughts concerning biodiesel use and production.

Key Findings

After reviewing the listening session presentations and the studies conducted by academia, other states, and local government, the Biodiesel Workgroup found that:

1. The economic analyses conducted in other states to determine the impact of biodiesel production were conducted by consulting firms with expertise in the biodiesel industry and economics. These consulting firms generally charged $100,000.

2. The Biodiesel Workgroup lacked the financial resources and expertise to conduct an analysis of the economic impact of the use of biodiesel on the state, the agricultural community, petroleum marketing and distribution, and biodiesel consumers, as well as the supply of biodiesel fuel and demand for biodiesel fuel in the Commonwealth. No funding was appropriated to the Secretariat that would have allowed the Workgroup to hire a qualified consultant to assist in the completion of this analysis.

3. Biodiesel studies that have been conducted in the Commonwealth and in other states focused on the feasibility of locating a biodiesel production plant in a specific location within the state. It would be virtually impossible to conduct a feasibility study for the development of a biodiesel production plant that would apply throughout the Commonwealth.

4. Industry sources maintain that the current level of degummed soybean oil production within the Commonwealth combined with import sources are adequate to produce 20 million gallons of biodiesel stock annually. The current production capacity for refined soybean oil is approximately five million gallons annually. The majority of the product is sold outside the Commonwealth.

5. There is a need for increased education and awareness of biodiesel. Large scale educational, marketing and promotional activities are needed to educate the citizens, petroleum marketers and distributors, engine manufacturers, and the agricultural community about biodiesel.

6. Industries that either distribute or consume large quantities of diesel fuel are opposed to a mandate requiring the use of biodiesel.

7. There are several Federal tax incentives available to biodiesel producers and users. These incentives are contained in the American Jobs Creation Act of 2004, Clean Air Act Amendments of 1990, Energy Policy Act of 2005, International Fuels Tax Agreement, and Farm Security and Rural Investment Act of 2002.

8. The American Jobs Creation Act provides for a federal excise tax credit, and amounts to one penny per percentage point of biodiesel in a fuel blend made from agricultural products such as soybean oil, and one-half penny per percentage for biodiesel made from recycled oils. This tax credit has resulted in a tremendous increase in the production of biodiesel in the U.S.

9. Only a small number of states have created state level incentives for biodiesel and other renewable fuel sources. At the current time, Maryland is the only state contiguous to Virginia offering a state level tax incentive. In 2005 the Maryland legislature adopted a Renewable Fuels Promotion Act Tax Incentive. As the number of states offering incentives increases, the possibility of Virginia losing fuel sales due to lower prices in neighboring states will also increase.

10. Several local governments, universities and the Department of Transportation in Virginia are currently using biodiesel. The Clean Cities Program works with these groups to advance the nation's economic, environmental, and energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption.

11. The Virginia Soybean Association, through funding from the Virginia Soybean Board, has sponsored a Biodiesel rebate program for four years. The program was designed to encourage the use of biodiesel by farmers, commercial and construction fleets, municipal transit and school systems, and general consumers of diesel. Grants ranging from $100 - $10,000 have been offered to first time users of biodiesel. In addition, this year grants will be awarded to users of biofuel in the home heating market. This program has led to an increase in the number of fuel distributors in Virginia handling biodiesel. The Virginia Soybean Association's position is that biodiesel is good for our country as a renewable American made fuel, good for the environment, and the future sustainability of Virginia's farms.

12. Additional research is needed to find potential uses for glycerin, which is a refined soybean oil byproduct. Currently, there is a limited market for the product.

Recommendations

The Biodiesel Workgroup recommends that:

1. The Governor and the General Assembly do not mandate the use of biodiesel fuel in Virginia at this time but allow the market to drive the production and use of biodiesel.

2. The Governor and the General Assembly encourage and finance the Virginia Department of Agriculture and Consumer Services to promote and market biodiesel.

3. The Governor and the General Assembly request that state agencies having expertise in tax issues evaluate Virginia's current tax structure to determine if changes are needed to make biodiesel a competitive fuel source.

4. The Commonwealth of Virginia support the use of biodiesel and, where feasible, implement the use of biodiesel in its fleet of vehicles and equipment.

BACKGROUND AND AUTHORITY

Several years ago the Virginia Soybean Association and the Clean Cities Coalition joined forces to increase the production and use of biodiesel fuel in Virginia. They began meeting on a periodic basis with representatives from the Department of Mines Minerals and Energy and other state agencies to gather additional information and support for the development of the biodiesel industry. They worked with Delegate Harvey Morgan on a bill that for the most part mirrored Minnesota's biodiesel legislation. The Minnesota legislature has been the leader in implementing legislation mandating the use of biodiesel in their state. Delegate Morgan's bill, HB 694 (2004), would have required all diesel fuel sold or offered for sale in the Commonwealth for use in internal combustion engines to contain 2.0 percent biodiesel fuel by volume. The bill was continued to 2005 but was left in committee, largely due to concerns that the legislation would have some detrimental effects on industries that consume large quantities of diesel fuel. HB 694 became the impetus for the introduction and passage of House Joint Resolution 598 (Parrish), which requested that the Secretary of Agriculture and Forestry study the use and production of biodiesel fuel in Virginia paying particular attention to the capability and desirability of generating a minimum demand of 20 million gallons annually in the Commonwealth.

The study was to include an analysis of the economic impact biodiesel use would have on the state, the agricultural community, petroleum marketing and distribution, and biodiesel consumers, as well as the supply of biodiesel fuel and demand for biodiesel fuel in the Commonwealth. The Secretary was to consider the operational impact of biodiesel fuel on (i) engines and engine warranties; (ii) fuel economy; (iii) standards and testing methods of biodiesel fuel; (iv) the energy expended to produce such fuels; (v) the environmental benefits and impacts on air quality in nonattainment areas of the Commonwealth; (vi) the marketing of biodiesel fuel by the agricultural and industrial communities; (vii) the potential for public use within the Commonwealth and its political subdivisions; (viii) its feasibility in cold flow conditions, (ix) tax incentives or credits to promote the use of biodiesel fuel, (x) storage, blending, transportation, and distribution; and (xi) the current supply and potential for biodiesel plants to be located within the Commonwealth.

The study resolution requires that the Secretary of Agriculture and Forestry submit to the Division of Legislative Automated Systems an executive summary and its findings and recommendations on biodiesel fuel use and production in the Commonwealth no later than the first day of the 2006 Regular Session of the General Assembly.

STUDY SCOPE AND METHODOLOGY

The Secretary and Deputy Secretary of Agriculture and Forestry formed a workgroup consisting of staff from the Virginia Department of Agriculture and Consumer Services and a Governor's Fellow assigned to the Secretariat of Agriculture and Forestry.

The Biodiesel Workgroup held four meetings. The first meeting was held on May 13, 2005, to define the scope of the study. At that meeting the Workgroup concluded that due to the limited resources for conducting the study that the scope of the study would be limited to a review of

feasibility studies by academia, other states, and local government and information that could be gathered from persons who have expertise in the use and production of biodiesel fuel in the Commonwealth. The Governor's Fellow was assigned the task of reviewing and summarizing some of the existing studies on biodiesel use and production, giving special attention to the issues set out in HJR 598.

A second meeting was held to plan the biodiesel listening session that was conducted on August 8 and 9, 2005, in the auditorium of the Virginia Farm Bureau Federation. Persons with expertise in the topics outlined in the study resolution were invited to present at the public listening session. A public comment period followed the listening session to allow industry groups, advocacy groups and other interested parties to share their thoughts concerning biodiesel use and production. Although the session was well attended, only one person, representing the Virginia Motorcoach Association, offered comments during the public comment period. A third meeting was held to discuss the listening session presentations and the drafting of the study report. At the fourth and final meeting the Workgroup reviewed the draft study report and the suggested revisions.

WHAT IS BIODIESEL?

Biodiesel is a clean burning alternative fuel produced from soybean, vegetable and animal oils and recycled waste oils through transesterification. Soy biodiesel is the most common type of biodiesel used in the United States. Biodiesel is used as a pure fuel source as well as in a variety of blends. Three of the most common blends are listed below:

- B2
  - Mixture of 2% biodiesel and 98% petroleum diesel
  - Economical fuel that increases lubricity and provides some emissions benefits
- B20
  - Mixture of 20% biodiesel and 80% petroleum
  - Meets the government EPAct and provides greater emissions benefits
- B100
  - 100% Pure biodiesel
  - Biodegradable, non-toxic, renewable energy source

The three main reasons for researching biodiesel are:

- Reducing U.S. dependence on foreign oil
- Developing environmentally friendly and renewable energy sources
- Promoting value-added agricultural products for use in the industrial industry.

Biodiesel burns cleaner and has a lower flash point than petroleum diesel. It reduces the amount of particulate matter in the air and lowers the emissions of nitrogen, carbon monoxide, and unburned carbons. Limited or no changes need to be made to current engines to use biodiesel. Biodiesel costs more to produce than petroleum diesel and there are problems with cold flow conditions and storage.

OVERVIEW OF BIODIESEL STUDIES

In compiling the biodiesel data staff researched eight studies that had been completed by other states and localities. Staff also attended a Biofuels Forum in Arlington, Virginia sponsored by Blue Ridge Clean Fuels. Below is an overview of the research that was used in this study.

1. Biodiesel Implementation – Arlington County, Virginia, 2005
Prepared by: Latitude Associates
Prepared for: Virginia Clean Cities

The study looks at the implementation of B20 biodiesel into Arlington County's 138 school buses and other vehicles. The implementation occurred in September of 2001 as a means to reduce emissions and the environmental impact that diesel vehicles were having on the county. B20 has cost Arlington more money but they have been satisfied with the results of using a cleaner burning fuel. The study provides analysis of the following:

- Engine warranties
- Emissions requirements
- Biodiesel justification
- Handling, storage
- Fuel economy
- Environmental benefits
- Cold weather handling

2. A Study of the Feasibility of Biodiesel Production in Georgia, 2001
Prepared by: Ag Econ Department, University of Georgia
Prepared for: University of Georgia

The University of Georgia conducted a feasibility study looking at the production of biodiesel in Georgia. The study outlined:

- Benefits and potential drawbacks to biodiesel
- Georgia biodiesel demand
- Biodiesel production process
- Feedstock costs
- Economics of Biodiesel production
- Environmental Impacts of Biodiesel Use

The study concluded that biodiesel can be produced in Georgia and easily integrated into the existing distribution system. However, without government mandates or subsidies biodiesel is not cost competitive with petroleum diesel.

3. Economic Impact of Soy Diesel in Kentucky, 2003
Prepared by: Ag Econ Department, Murray State University
Prepared for: KY Farm Bureau, KY Clean Fuels Coalition, KY Soybean Promotion Board, KY Department of Agriculture, KY Division of Energy, KY Transportation Cabinet

The Economic Impact of Soy Diesel on Kentucky study was very pro biodiesel. It highlighted many of the economic benefits of biodiesel and tended to overlook the extra cost of biodiesel in comparison with petroleum diesel. The main areas covered include:

- Environmental benefits of biodiesel
- Effects of biodiesel use on the farm sector and economy
- Economic Impact in KY
- Consumer costs and benefits

4. Mississippi Biodiesel Feasibility Study, October 2003

Prepared by: Frazier Barnes and Associates
Prepared for: The Mississippi Biomass Council and the Mississippi Technology Alliance

This is an extensive study that examines the entire biodiesel structure with a focus on the comparison between producing a value-added soybean and importing feedstocks into a Mississippi stand-alone processing plant. The areas covered include:

- The current biodiesel industry
- Biodiesel Market Segments
- Regional tax structures
- Licenses and permits
- Biodiesel Industry Future
- Financial Market
- Feedstock availability and cost
- Biodiesel Commercialization Options and Production Financial Projections

5. Statewide Feasibility Study for a Potential New York State Biodiesel Industry, 2003

Prepared by: LECG, LLC
Prepared for: New York State Energy Research and Development Authority

There is a substantial market for diesel fuel in New York. New York can supply some of the feedstock requirements but not all of them. The study covers the effects on the agriculture industry and needed investments in infrastructure by distributors. It examines five policy options that should be phased in and linked to biodiesel capacity in New York:

- Stand alone B2 mandate
- B2 Mandate combined with an incentive for infrastructure
- B2 Mandate combined with biodiesel supply incentive
- Stand alone supply incentive
- Combined supply and demand incentive

6. North Dakota State University Biodiesel Fuel Study, February 2003

Prepared by: North Dakota State University
Prepared for: North Dakota State University Extension Service

This study is a scientific analysis and description of how biodiesel is created and how it could be used by farmers in North Dakota. The study looks at the following areas:

- Transesterification technology
- Engine Studies and Warranties

- Air Pollution
- Mixing and storage of biodiesel
- Potential fuel from oil crops

7. Biodiesel in Oregon: Environmental Impacts and Economic Feasibility on the Columbia Plateau, 2004

Prepared by: Tristan Nunez, Environmental Studies
Prepared for: Lewis and Clark College

The study looks specifically at the environmental impacts and economic feasibility of biodiesel production and use on the Columbia Plateau. It focuses on the use of canola as the feedstock rather than soybean oil. Using canola as the feedstock, the study did similar analysis in the following areas:

- Environmental Impacts
- Economic Feasibility

The study concluded that biodiesel is not perfect but it has more positive effects on the environment than petroleum diesel. Canola feedstock costs are too high using current production technologies. It will take technological innovations to make biodiesel economically feasible.

8. An Evaluation of Biodiesel Feasibility in Wisconsin, 2005

Prepared by: University of Wisconsin- Madison Department of Agricultural and Applied Economics
Prepared for: University of Wisconsin- Madison Department of Agricultural and Applied Economics

The study examines the feasibility of a biodiesel production facility. It looks at the issue through examining the following areas:

- The Wisconsin Market
- Potential Feedstocks and Availability
- Advantages and disadvantages of biodiesel
- Market Access
- Physical Plant Characteristics and location
- Operating costs
- Cost Competitiveness
- Regulatory Environment

Wisconsin concludes there needs to be government incentives for biodiesel to be competitive in the marketplace. There will be a small niche market for biodiesel without incentives; however that market is not large enough to support a production facility in Wisconsin.

Engines and Engine Warranties

North Dakota State University Biodiesel Fuel Study, February 2003

Studies have shown that biodiesel can operate in a conventional diesel engine. Standard diesel engines will operate on 100% biodiesel; however, in cold weather biodiesel is not as effective, it

begins to cloud and thicken at about 30ºF. Biodiesel also thickens in warmer temperatures. Solutions to the cold and warm temperatures affecting biodiesel include installing a fuel line heater, adding additives to the biodiesel and mixing diesel with biodiesel.

Biodiesel blends have indicated improved lubricating ability which should reduce wear and tear extending the fuel system and engine life. Older fuel engines (built prior to 1993) may show fuel pump seal deterioration if 100% biodiesel is used. It is also recommended that after switching to biodiesel that the fuel filter be replaced.

A Study on the Feasibility of Biodiesel Production in Georgia (2001)

Biodiesel has a lower flash point than petroleum diesel. Biodiesel dissipates engine heat better than petroleum diese.l

Biodiesel Implementation – Arlington County, Virginia (2005)

Personnel at Arlington County reported no maintenance, performance, or reliability problems with the engines that operate with B20. Even though they have not had any problems operating engines with B20, manufacturers are concerned about combustion deposits, fuel injection system durability, and accelerated engine oil degradation.

Engine manufacturers warranty the engines they produce, not the fuel used in the engine. The use of biodiesel will not void the engine manufacturer's warranty. Manufacturers can recommend what type of fuel to use in the engine. The American Society of Testing and Materials has approved the B100. Below is a chart of the max blend recommendation for five engine manufacturers:

Manufacturer	**Max Blend Recommendation**
Caterpillar	B100
Cummins	B5
Detroit Diesel	No Comment
International	B20
John Deere	B5

A complete list of the fuel recommendations can be found on the following webpage: http://biodiesel.org/resources/fuelfactsheets/standards_and_warranties.shtm

Fuel Economy

Biodiesel Implementation – Arlington County, Virginia (2005)

Arlington County has not been tracking the fuel mileage of its fleet. It expects to find that there is a small reduction in mileage due to the use of biodiesel. B20 on average costs 20 cents more per gallon than petroleum diesel. On average there is a 2% loss in fuel economy when using biodiesel.

Standards and Testing Methods of Biodiesel Fuel

Mississippi Biodiesel Feasibility Study, October 2003

Biodiesel must meet the American Society for Testing and Materials (ASTM) requirements in order to become EPA registered and meet all end-user requirements. The ASTM biodiesel standard is: ASTM D6751.

American Society for Testing and Materials Requirements for Biodiesel Fuel:

D6751-03a Standard Specification for Biodiesel Fuel (B100) Blend Stock for Distillate Fuels

> 1.1 This specification covers biodiesel (B100) Grades S15 and S500 for use as a blend component with diesel fuel oils defined by Specification D 975 Grades 1-D, 2-D, and low sulfur 1-D and 2-D.
>
> 1.2 Biodiesel may be blended with fuel oils whose sulfur or aromatic levels are outside Specification D 975 Grades 1-D, 2-D, and low sulfur 1-D and 2-D, provided the finished mixture meets pertinent national and local specifications and requirements for these properties.
>
> 1.3 This specification, unless otherwise provided by agreement between the purchaser and the supplier, prescribes the required properties of biodiesel fuel at the time and place of delivery.
>
> 1.4 Nothing in this specification shall preclude observance of federal, state, or local regulations which may be more restrictive.
>
> Note 1—The generation and dissipation of static electricity can create problems in the handling of distillate fuel oils with which biodiesel may be blended. For more information on the subject, see Guide D 4865.
>
> 1.5 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

Most major companies have made statements regarding the use of B20 in their engines. Some of the statements can be found on the National Biodiesel Board website at www.biodiesel.org.

Energy Expended to Produce Biodiesel

An Evaluation of Biodiesel Feasibility in Wisconsin, 2005

On average the general energy yield of the biodiesel process is greater than that of other bio-fuels. The current biodiesel process yields about 3.2 units of energy for every unit of energy consumed in the production process. The general conversion of feedstock to biodiesel is:

100 lbs. of feedstock + 10 lbs. of methanol → 100 lbs. of biodiesel + 10 lb. of glycerol

A Study on the Feasibility of Biodiesel Production in Georgia (2001)

Biodiesel production is an efficient process returning about 3.2 units of energy for each unit used in production.

Environmental Benefits and Impacts on Air Quality

Biodiesel Implementation – Arlington County, Virginia (2005)

Fleet management noticed a reduction in the visible exhaust and in the production of particulates. John Morrill, Arlington County Energy Manager estimates the benefit of using B20 based on the EPA emission numbers:

Emission	Production compared to Conventional Diesel
Particulates	-10%
Hydrocarbons	-21%
Carbon Monoxide	-11%
Carbon Dioxide	-16%
NOx	+2%

An Evaluation of Biodiesel Feasibility in Wisconsin, 2005

Biodiesel reduces the amount of emissions that are released into the environment. However, the use of biodiesel does result in an increase in the emissions of nitrous oxide (NOx). Biodiesel is a renewable fuel source that will increase soybean production and use.

A Study on the Feasibility of Biodiesel Production in Georgia (2001)

Biodiesel burns cleaner than petroleum diesel. This reduces the amount of particulate matter that lowers emissions of nitrogen, carbon monoxide and unburned hydrocarbons.

Marketing of Biodiesel by the Agricultural and Industrial Communities

Mississippi Biodiesel Feasibility Study, October 2003

The agricultural and industrial communities can use biodiesel as a replacement for diesel fuel. There are additional markets that could be developed for biodiesel. Those markets include:

- Developing a market for biodiesel solvents
- Pursue the US Postal Service because it is required to use competitively priced alternative fuels
- Sell biodiesel to diesel generator stations that produce power
- Develop a market for biodiesel as home heating oil

- Develop a market for university and school buses

Commercialization Options:

Stand-alone biodiesel production plant – a plant that uses oil from outside sources as its feedstock

- Less capital cost per gallon of biodiesel production
- Less management and operations requirements
- Easier to site, it does not have to be located in a soybean production region

Integrated biodiesel production plant – a plant that processes an oilseed and extracts the oil as a feedstock for biodiesel production

- Lower virgin vegetable oil feedstock costs
- Higher feedstock security since it is being supplied by on-site soybean processing plant
- Less control of feedstock costs and supply
- Provides a value-added soybean opportunity to producers

An Evaluation of Biodiesel Feasibility in Wisconsin, 2005

Fuel terminals are the most likely outlets for biodiesel. The biodiesel could be splash mixed at the terminal and sold through the current fuel infrastructure. The petroleum industry in general is vertically integrated, making it difficult for biodiesel to penetrate into the market. Until this can happen, the way for biodiesel to enter the commercial market is through the delivery of biodiesel to local wholesalers or retailers and blending onsite.

Potential for Public Use within the Commonwealth and its Political Subdivisions

Mississippi Biodiesel Feasibility Study, October 2003

Biodiesel demand will be based on the current market for diesel fuel. It is assumed that the availability of biodiesel will not create a new market or expand the overall market for diesel fuel. Marketing groups and channels will develop as the market for biodiesel grows.

Biodiesel can be used in three primary markets – wholesale, retail and government markets. Firms that specialize in biodiesel marketing and production control the wholesale market. The retail market consists of fueling stations, oil companies, marinas and railroad operators. The retail market is developed through a full-scale marketing approach and allows the most potential for a higher profit margin. The government market will include state agencies, military bases and other government entities.

Biodiesel Implementation – Arlington County, Virginia (2005)

Currently in Virginia the following locations are using biodiesel: Harrisonburg City, Arlington County, Hampton Roads and Valley Proteins in Winchester.

Biodiesel Feasibility in Cold Flow Conditions

A Study on the Feasibility of Biodiesel Production in Georgia (2001)

Biodiesel can gel in cold weather conditions. The temperature at which biodiesel gels varies depending on the type of feedstock that is used in production. The amount of saturated fat in the feedstock determines when biodiesel gels. Biodiesel made from animal fats which have a more saturated fat will gel at higher temperatures. Biodiesel made from canola oil gels at the lowest temperature.

Biodiesel Implementation – Arlington County, Virginia (2005)

In order to avoid gelling and fogging of the biodiesel a liquid additive such as Artic Flow is added to the biodiesel blend. It is used to prevent crystallization and blocking in fuel flow lines and filter systems.

Tax Incentives or Credits to Promote Use of Biodiesel

Feasibility Study for a Potential New York State Biodiesel Industry, June 2003

New York has developed five B2 polices to promote biodiesel use and production in the state. Policy option one is a stand-alone mandate. This would require diesel to contain at least two percent biodiesel. The mandate would be linked to production capacity within the state. The mandate would greatly stimulate investment into the biodiesel industry and increase demand for biodiesel. It would be an added cost to the consumers and individual businesses. The mandate would generate additional tax revenue for the state.

A second policy option would be to combine the mandate with an incentive for infrastructure. This would provide incentives for expanding and improving biodiesel facilities in order to meet the increased demand as a result of the mandate. This option would result in a net loss to the state because of the costs associated with the infrastructure incentive.

A third policy option is the mandate combined with a biodiesel supply incentive. The supply incentive would provide a grant of $0.10 per gallon of biodiesel produced in the state with a maximum of 10 million gallons capped at five years. This combination provides incentives to producers and a demand base. This option would add dollars into the New York economy and create new jobs. It would cost the state to provide the incentive but it is estimated that more money would be generated than paid out.

The fourth policy option presented by New York is a stand alone supply incentive. The incentive would be the same as the one noted above however the demand base would not be as solid as with a mandate. This policy would not attract as many new producers but could assist producers with their start up costs.

The fifth policy option is a combined supply and demand incentive. The incentive would take the form of a one-half of one cent exemption from the state excise taxes on distillate fuel for each

1% of biodiesel used. This would be very expensive to the state treasury. The combination stimulates demand and would attract more biodiesel production.

Biodiesel Implementation – Arlington County, Virginia (2005)

The American Jobs Creation Act of 2004 contains provisions for tax incentives for biodiesel for the next two years starting in 2005. A summary of the act is below:

- Creates a one penny per percentage point tax credit for biodiesel made from virgin oils derived from agricultural and animal fats
- Creates a one-half penny per percentage point tax credit for biodiesel made from non virgin agricultural products and animal fats
- Allows the credit to be claimed in taxable and nontaxable markets
- Streamlines the use of biodiesel at the terminal rack, encourages petroleum blenders to blend the diesel as far up stream as possible

The following states have tax incentives/mandates relating to biodiesel:

Arkansas
Illinois
Indiana
Kentucky
Maine
Maryland
Minnesota
Missouri
North Carolina
Pennsylvania
Texas

Storage, Blending, Transportation, and Distribution

A Study on the Feasibility of Biodiesel Production in Georgia (2001)

Biodiesel can be corrosive to liners and rubber materials. It cannot be stored in concrete lined tanks. Pure biodiesel has to be stored and transported at temperatures above 50º F and the blending temperature needs to be above 40º F. The most commonly used blends are 2 and 20 percent blends. A 20% blend is the best blend for general uses.

Biodiesel Implementation – Arlington County, Virginia (2005)

Storage Tank

Biodiesel blends can be stored above or below ground. It is recommended that biodiesel is stored below ground because of the issues that biodiesel has in cold weather conditions. Underground tanks maintain the fuel at higher temperatures than above ground tanks. In order to avoid cold weather problems such as fogging and gelling, it is recommended that suppliers add an anti-gelling compound such as Arctic Flow to the biodiesel.

Storage Life

Biodiesel's shelf life is less than straight diesel. Biodiesel should only be used in engines that are used on a regular basis. It should not be used in equipment that is not regularly used such as backup generators and compressors that are used infrequently.

Blending

B100 can be stored onsite and blended by the user of biodiesel. This process is more complex and would require the user to have three tanks on the property. One tank would store the B100, a second would store diesel and at least a third for the blended product. The benefit to this set up is that the user is able to blend any form/level of biodiesel.

Mississippi Biodiesel Feasibility Study, October 2003

Distribution Factors to Consider:

- Soybean/Soybean oil availability and cost
- Biodiesel market access
- Rail access
- Distance from closest processor/biodiesel production plant
- Truck transportation access
- Economic incentives/site infrastructure
- River access

An Evaluation of Biodiesel Feasibility in Wisconsin, 2005

Transportation

For a plant to consider locating in Virginia, access to excellent rail line and roadways is important. It is less expensive if feedstocks can be delivered via rail lines. It is important to locate in an area that allows the biodiesel manufacturer to minimize transportation costs.

SUMMARY OF LISTENING SESSION PRESENTATIONS

Presenter: Dale Bennett, Virginia Truckers Association
Topic: Engines and Engine Warranties and Fuel Economy

- Trucking Industry Impacts and Concerns Regarding a Biodiesel Mandate
    - Environmental Impact
        - Impacts are hard to measure
        - Only has minimal impact unless it is added at high levels
        - Increases nitrogen oxide emissions
        - Some data shows that particulate matter emissions can increase when biodiesel is added to ultra-low sulfur diesel
    - Potential Supply Problems
        - Virginia only based mandate could cause serious fuel supply problems
        - If a biodiesel supplier in Virginia has problems it could be hard to get diesel from other states to help with the shortage
    - Higher Fuel Prices & Lower Fuel Economy
        - Less competition and higher fuel prices
        - Competitive disadvantage for local trucking companies
        - Could disrupt the refueling practices of interstate trucking companies
    - Engine Problems & Costs
        - Gelling in cold weather
        - Still viewed as an experimental fuel, not sure of the long term effects on engines
        - Could void the engine warranty
        - Many issues still need to be addressed in regard to engine problems
    - Lower Diesel Fuel Sales in Virginia
        - Result in Virginia becoming a "fuel island"
        - Truckers would avoid buying fuel in Virginia, resulting in lower federal highway fund allocations for Virginia
    - Biodiesel Does Hold Promise, but a Mandate is Not the Answer

Presenter: Dick Atkinson, Virginia Soybean Association
Topic: Marketing of biodiesel fuel by agricultural and industrial communities

- Marketing, Who Today?
    - U.S. Government
    - Distribution/Blenders
    - City/County/School Districts
    - Producers
    - General Public
    - Corporate Fleets
- Steps in Progress
    - Pilot Programs
    - Coordinated efforts with VA Clean Cities/Blue Ridge Clean Fuels/DMME
    - Efforts to gain state government support and legislation

    - Efforts by the Virginia Soybean Association
- Value of Feedstock
    - Opening CBOT value for soybean oil (8/5) was $23.85 per hundred weight
    - Basis FOB Chesapeake was + 2 the option
    - Soybeans are main ingredient cost
- Opportunities to market biodiesel today
    - Tax credit through 2008 – 0.1 cent per 1 % of blended diesel up to 20%
    - State tax incentives
    - Credit for installation of alternative fuel refueling infrastructure (B20)
    - Small agri-biodiesel producer tax credit (.10 cent/gallon up to 15 million gallons)
    - Biodiesel engine testing programs
    - Renewable fuel standard, mandates the use of 7.5 billion gallons of renewable fuels by 2012
    - Soybean Board grant and rebate programs
- Conclusion
    - Raise awareness
    - Tax incentives, rebates and grants are available to stimulate biodiesel use and production
    - The State of Virginia should support agriculture in the Commonwealth and the state should promote the use of renewable fuels throughout all levels of state government and offer incentives to distributors of biodiesel so they can more readily make the product available to consumers.

Presenter: Doug Faulkner, Virginia Biodiesel Refinery, LLC
Topic: Realities of producing biodiesel in Virginia

- Some states have enacted credits and mandates for biodiesel
- Owns first biodiesel refinery in Virginia
    - Started with a relationship with the soybean association and farmers
    - Check off dollars established the basis for biodiesel
- Three sides
    - Economics of production
        - When a gallon of biodiesel is sold, the dollar covers new seed, salaries and repairs
        - Problems with blend ratio and pricing
            - High sensitivity to the price and blending
            - Current market conditions B20 $2.05/gallon, B2 $1.85/gallon
            - At a B2 blend, excise taxes are not needed
    - Matching production capacity to the market
        - Virginia has been slow to accept biodiesel
        - Weight of the product, you have to be close to the supplier
        - Important to focus on the quality of biodiesel
        - Virginia biodiesel production will be focused on the demand in Virginia
        - Need to focus on the end user, helping them blend and reach the consumer
        - President's visit helped shape a positive image for biodiesel
    - Players in the biodiesel industry

        - Everyone is a player, it helps the economy, the environment and the farmers
- Virginia needs to mirror the federal standards
    - The market, the supply and the demand exists
    - Give Virginia an energy choice

Presenter: Tammy West, Department of Motor Vehicles
Topic: Tax incentives or credits to promote the use of biodiesel

- Biodiesel in Virginia and Other States
    - Virginia, North Carolina, South Carolina, West Virginia, Colorado, Kansas, Minnesota, Nebraska, Oregon, Wyoming
        - No tax incentives in those states
    - Maryland
        - 2005 Renewable Fuels Promotion Act Tax Incentive
    - Illinois
        - Sales tax incentive but excise tax rate are unaffected
    - Montana
        - 2 tax incentives, one for producer and one for distributor
    - Texas
        - Fuel Ethanol and Biodiesel Production Incentive Program
- Federal Incentives
    - American Jobs Creation Act of 2004
        - Ethanol and Biodiesel Tax Credit
    - EPA Implementation of the Clean Air Act Amendments of 1990
        - Clean School Bus USA
    - Energy Policy Act of 2005
        - Biodiesel engine testing program
        - Extension of excise tax provisions and income tax credit for biodiesel
        - Small agri-biodiesel producer credit
        - Waste derived ethanol and biodiesel
    - Farm Security and Rural Investment Act of 2002
        - Renewable energy systems and energy efficiency improvements program
    - International Fuels Tax Agreement

Presenter: Dan Laing, Virginia Department of Transportation Fuel Program Manager
Topic: Environmental incentives and disincentives of using biodiesel

- Why is biodiesel an option for the state?
    - EPA ultra-low sulfur diesel fuel mandate
    - Biodiesel increases lubricity, which is needed when using ultra-low sulfur fuels
- Benefits of using biodiesel blend
    - Additional lubricity
    - Alternative Fuel Use Credits (EPACT of 1992)
    - Reduced Emissions

        - Hydrocarbons, Carbon Monoxide, Particulate Matter, Sulfates, PAH and nPAH
    - Considerations to be addressed when evaluating biodiesel for use in State Fleets
        - Cloud Point/Cold Filter Plugging Point
        - NOx Emissions Testing
        - Oil Source
        - ASTM Standards
        - Mixing and Storage
        - Equipment Age

Presenter: David Blatnik, Marathon Ashland Petroleum
Topic: Issues concerning biodiesel mandates inside the oil industry

- Minnesota's Biodiesel Mandate
    - All diesel fuel sold in Minnesota must contain at least 2% biodiesel fuel by volume
    - The mandate applies to all combustion engine users
    - Blending can take place at the refinery, terminal, bulk plant or end users fueling point
    - Terminal Infrastructure
        - Tanks must be heated and insulated
        - Lines and valves must be heated and insulated from tanks to loading head
        - Cold base fuel issues
        - Blending issues
    - Product Receipt Issues
        - Heated off load facilities (transport/rail)
        - Can biodiesel be pipelined
        - Adequate supply in region
    - Cost of the Mandate
        - 1 to 2 million dollars to install needed infrastructure per facility
        - $80,000/year to heat tanks
        - Biodiesel $1.40 to $2.20 a gallon
        - Freight $0.02 to $0.20 a gallon
        - Two stop loading $20 a load
    - Industry Issues with the Mandate
        - Makes Minnesota an island for diesel supply
        - Haulers bypass Minnesota for fueling needs
    - Transportation
        - Movement by pipeline is being explored
        - Movement by Transport
            - Heating and insulated trailers
            - Delivery schedules
        - Movement by Rail
            - 99% of terminal facilities don't have a rail spur on property
            - Heated off load station required

- Minnesota mandate will work but retailers and consumers are going to have to pay extra and it will be hard on the supply infrastructure to handle the demand

Presenter: Rick Koontz, Holtzman Oil
Topic: Current supply and potential for biodiesel plants in Virginia

- First time they used biodiesel they had issues with cold weather conditions
- They have 9 retail sites in the Valley that sell biodiesel @ 5% blend
- Freestanding signs have been placed and biodiesel labels are on the biodiesel pumps
- Expanding retail sites in Virginia and West Virginia
- Use biodiesel for home heating oil and for cars/buses
- Biodiesel exhaust is much cleaner
- Looked into creating a soybean crusher and refinery in the Valley
  - They found site and lenders working with the county
  - Would need grain storage on site and contracts with local farmers to store more soybeans
  - Valley could not generate enough soybeans for production
  - Estimated cost $7.5 million
  - They found that they could not compete with the larger plants in the United States, much more efficient when it is a larger plant
  - Found that they could not compete with the large refineries and crushers
  - The biodiesel that they sell is supplied by Doug Faulkner
- There is a growing demand for biodiesel that is growing all the time

Presenter: David Holshouser, Virginia Tech, Tidewater AREC
Topic: Soybean production and supply in Virginia

- Virginia Soybean Production Systems
  - Full-Season
    - Planted in May, mature in October
    - Conventional and no-till
    - Higher yields
  - Double Crop
    - Planted in late June, mature in late October
    - Most is no-till
    - Lower yields than full-season system
  - 70-80% of Virginia Soybeans are “Roundup-Ready” leading to:
    - Decreased herbicide costs
    - Increased seed costs
  - Major Issues Facing Virginia Soybean Producers
    - Cost of Production
    - Land costs higher than in the Mid-West
  - 18 million bushels produced in 2004
  - On average 12-18 million bushels are produced yearly in VA
  - How many gallons of soybean biodiesel can Virginia provide?

        - Assuming 500,000 acreage and that 1.5 million gallons of biodiesel can be produced from 1 million bushels of soybean:
        - 12 million bushels = 18 million gallons
        - 15 million bushels = 22.5 million gallons
        - 18.5 million bushels = 27.75 million gallons
    - Biodiesel is good news for Virginia Farmers

Presenter: Nic van Vuuren, Clean Cities
Topic: Potential for public use within Virginia and its political subdivisions

- Market Development in Virginia – B20 Fleets
    - Arlington County
    - Westmoreland Schools
    - US Navy Portsmouth and Yorktown
    - Valley Proteins
    - City of Harrisonburg
    - James Madison University
- B20 Readiness
    - Prepare Fleet for acceptance and use of B20
        - Tank Cleaning
        - Filtration/Plumbing
- Virginia Biodiesel Experience- Arlington County
    - Arlington operates all diesel equipment on B20 since 2001
        - 100 School buses, MY 1991-2004
        - 100,000 gallons of B100 annually
        - No operational problems identified with biodiesel use
- Northumberland Schools B20 Pilot Summary
    - 2.5% loss in fuel economy with use of B20
- Sysco B20 Pilot Summary
    - Experienced decrease in fuel economy
- B100 is covered by ASTM standards. Blends do not have a standard.
- Quality Control of Biodiesel is not well documented at this point
- Biodiesel B20 pilot programs have been successful in Virginia
- Incentives or some form of financial help is needed for biodiesel implementation across Virginia

Presenter: Jim Syndor, Virginia DEQ
Topic: Environmental benefits and impacts on air quality in nonattaninment areas of Virginia

- Regional Program Overview
    - Ozone nonattainment area program
    - PM 2.5 nonattainment area program
    - Regional Haze Program
    - Diesel particulate/toxics strategy
- Areas with Air Quality Challenges

    - D.C. Metropolitan Area
    - Richmond Metropolitan Area
    - Hampton Roads Metropolitan Area
    - Roanoke/Winchester Metropolitan Areas
- Diesel Engines are significant sources of NOx and PM emissions
- Diesel Emission Reduction Technologies
    - EPA verified technologies
    - Diesel oxidation catalysts
    - Particulate filters
    - Use of biodiesel
- New Federal Standards to Reduce Diesel Emissions
    - 2007 Heavy Duty Diesel Highway Standards
    - New Non-Road Diesel Rule
    - Fleet Turnover
- New Federal Fuel Requirements
    - Highway Diesel Fuel
        - 97% reduction in sulfur by 2007
        - 500 ppm to no more than 15 ppm
    - Non-road Diesel Fuel
        - 99% reduction in sulfur by 2010
        - 3,000 ppm to no more than 15ppm
- Biodiesel and Air Quality
    - Reductions in CO, PM, VOC, and SO4
    - Increase in NOx emissions
- Potential Biodiesel Use
    - Ozone Attainment Areas
        - Beneficial
        - Reduction of toxic diesel particulates
    - Ozone Nonattainment Areas
        - Use is still beneficial
        - To ensure no NOx increase, no more than B5

Presenter: Mike O'Connor, Virginia Petroleum, Convenience and Grocery Association
Topic: Storage, blending, transportation and distribution

- Fuel Quality and Price
    - Biodiesel contains 8% less energy per gallon than No. 2 diesel
    - Using B20 results in a 1-2% difference of power, torque and fuel economy
    - Using a 2% blend is estimated to increase the cost of diesel by 2 to 3 cents per gallon
- Blending Issues
    - Time consuming and messy to blend on your own, increased demand for upstream blending
    - Upstream blending will increase the cost, who will pay the cost?
    - Most engine manufacturers are concerned about biodiesel and do not recommend above a B5 blend

- Conclusions
  - Biodiesel is more expensive
  - Lubricity and environmental benefits
  - Untapped market in home heating oil
  - Ultra low sulfur diesel mandate will significantly increase biodiesel use
  - Virginia must not mandate fuel specifications

Presenter: Ray Filasky, Southern States
Topic: Storage, blending, transportation and distribution

- Southern States supports the biodiesel industry
  - Positive impact on farmer members
  - Stimulates economic growth in rural areas
  - Works well in overall distribution of power fuels
  - Favorable environmental effects
  - Long-term potential of renewable fuels
- Normal Distribution of Petroleum Products
  - Major Terminal > Bulk Transport > Distributor Bulk > Delivery Truck > End User
- Current Procurement Options for Biodiesel
  - Virginia Biodiesel Refinery
  - Transport loads from out-of-state suppliers
  - Rail Shipments
  - Third Party Providers
- Biodiesel Storage
  - Availability of dedicated storage
  - Capital expenditures with uncertain payback
  - Significant lead time for permitting of additional tankage
  - Cold weather properties of the neat product
  - Shelf life in end user tanks
- Introducing Biodiesel into the Distribution System
  - Metered injection
  - Measured Simultaneous Receiving
  - Measured Simultaneous Loading
  - Splash Blending
  - Neat Product Delivery
- Summary
  - Biodiesel is a good product with long-term market potential
  - Current price parity with conventional diesel is artificial
  - Product choice is subject to price sensitivity
  - Current distribution methods are cumbersome
  - Infrastructure improvements can enhance distribution
  - Current financial incentives are not adequate to stimulate these improvements

Presenter: C.J. Brodrick, James Madison University
Topic: Realities of biodiesel use and production in Virginia

- JMU Experience with Key Biodiesel Issues
  - Fleet Implementation
    - Engine warranties and wear
      - Most engines covered to 5%
    - Fuel Economy
      - Improvement, better combustion
    - Cold Flow Issues
      - Use additives
    - Public Fleet Use
      - Harrisonburg City adopted 2% with some on 5%
      - Strong operator and public acceptance
    - Solvency
      - Phase in at low concentration
      - Monitor fuel filters
      - Change out rubber on older vehicles
    - Higher Cloud Point
      - Monitor fuel for gelling
    - Shelf life
      - Limited for 4-6 months
    - Water accumulation/bugs – need to monitor tanks
    - Less energy density
    - Higher costs
  - Impacts
    - Fossil Fuel – displaced 4,000 gallons to date
    - Greenhouse gas – lifecycle reductions can be estimated
    - Air Quality- PM reduced
    - EPA Credits
    - Reliable, improved engine performance
      - High cetane number
      - Increased lubricity
    - "Green Image" commitment to cleaner renewable energy
    - Positive operator feedback
    - Potential agriculture support
  - Production
    - Standards and testing methods are costly
    - Potential for biodiesel plants
      - Experience in state
      - Experimenting with small production

Public Comment Period
Doug Douglas, Virginia Motorcoach Association

- Motorcoach Association is concerned about the unanswered questions within the biodiesel industry
- Many engine manufacturers will not warranty the engine if biodiesel is used (listed in the fine print of the warranty)
- More questions were raised than answers provided
- Must first resolve the warranty issues in order for the Motorcoach Association to support the use and production of biodiesel
- Should allow the market to support biodiesel. The solution is not a mandate by the government
- Biodiesel has tremendous benefit but more studies need to be done before it can be used/mandated in Virginia

KEY FINDINGS

After reviewing the listening session presentations and the studies conducted by academia, other states, and local government, the Biodiesel Workgroup found that:

1. The economic analyses conducted in other states to determine the impact of biodiesel production were conducted by consulting firms with expertise in the biodiesel industry and economics. These consulting firms generally charged $100,000.

2. The Biodiesel Workgroup lacked the financial resources and expertise to conduct an analysis of the economic impact of the use of biodiesel on the state, the agricultural community, petroleum marketing and distribution, and biodiesel consumers, as well as the supply of biodiesel fuel and demand for biodiesel fuel in the Commonwealth. No funding was appropriated to the Secretariat that would have allowed the Workgroup to hire a qualified consultant to assist in the completion of this analysis.

3. Biodiesel studies that have been conducted in the Commonwealth and in other states focused on the feasibility of locating a biodiesel production plant in a specific location within the state. It would be virtually impossible to conduct a feasibility study for the development of a biodiesel production plant that would apply throughout the Commonwealth.

4. Industry sources maintain that the current level of degummed soybean oil production within the Commonwealth combined with import sources are adequate to produce 20 million gallons of biodiesel stock annually. The current production capacity for refined soybean oil is approximately five million gallons annually. The majority of the product is sold outside the Commonwealth.

5. There is a need for increased education and awareness of biodiesel. Large scale educational, marketing and promotional activities are needed to educate the citizens,

petroleum marketers and distributors, engine manufacturers, and the agricultural community about biodiesel.

6. Industries that either distribute or consume large quantities of diesel fuel are opposed to a mandate requiring the use of biodiesel.

7. There are several Federal tax incentives available to biodiesel producers and users. These incentives are contained in the American Jobs Creation Act of 2004, Clean Air Act Amendments of 1990, Energy Policy Act of 2005, International Fuels Tax Agreement, and Farm Security and Rural Investment Act of 2002.

8. The American Jobs Creation Act provides for a federal excise tax credit, and amounts to one penny per percentage point of biodiesel in a fuel blend made from agricultural products such as soybean oil, and one-half penny per percentage for biodiesel made from recycled oils. This tax credit has resulted in a tremendous increase in the production of biodiesel in the U.S.

9. Only a small number of states have created state level incentives for biodiesel and other renewable fuel sources. At the current time, Maryland is the only state contiguous to Virginia offering a state level tax incentive. In 2005 the Maryland legislature adopted a Renewable Fuels Promotion Act Tax Incentive. As the number of states offering incentives increases, the possibility of Virginia losing fuel sales due to lower prices in neighboring states will also increase.

10. Several local governments, universities and the Department of Transportation in Virginia are currently using biodiesel. The Clean Cities Program works with these groups to advance the nation's economic, environmental, and energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption.

11. The Virginia Soybean Association, through funding from the Virginia Soybean Board, has sponsored a Biodiesel rebate program for four years. The program was designed to encourage the use of biodiesel by farmers, commercial and construction fleets, municipal transit and school systems, and general consumers of diesel. Grants ranging from $100 - $10,000 have been offered to first time users of biodiesel. In addition, this year grants will be awarded to users of biofuel in the home heating market. This program has led to an increase in the number of fuel distributors in Virginia handling biodiesel. The Virginia Soybean Association's position is that biodiesel is good for our country as a renewable American made fuel, good for the environment, and the future sustainability of Virginia's farms.

12. Additional research is needed to find ways to use glycerin, which is a refined soybean oil byproduct. Currently, there is a limited market for the product.

RECOMMENDATIONS

The Biodiesel Workgroup recommends that:

1. The Governor and the General Assembly do not mandate the use of biodiesel fuel in Virginia at this time but allow the market to drive the production and use of biodiesel.

2. The Governor and the General Assembly encourage and finance the Virginia Department of Agriculture and Consumer Services to promote and market biodiesel.

3. The Governor and the General Assembly request that state agencies having expertise in tax issues evaluate Virginia's current tax structure to determine if changes are needed to make biodiesel a competitive fuel source.

4. The Commonwealth of Virginia support the use of biodiesel and, where feasible, implement the use of biodiesel in its fleet of vehicles and equipment.

(Appendix A)

HOUSE JOINT RESOLUTION NO. 598

Requesting the Secretary of Agriculture and Forestry to study the use and production of biodiesel fuel in the Commonwealth. Report.

Agreed to by the House of Delegates, February 5, 2005
Agreed to by the Senate, February 24, 2005

WHEREAS, biodiesel fuel is a renewable, biodegradable, nonpetroleum-based liquid fuel derived from agricultural plant oils or animal fats; and

WHEREAS, biodiesel fuel can be blended with regular diesel fuel for use in internal combustion engines; and

WHEREAS, the production and use of biodiesel fuel can enhance agriculture and animal fat by-product markets in the Commonwealth; and

WHEREAS, such fuel is already being produced and marketed for sale in some locations in the Commonwealth; and

WHEREAS, some blends of biodiesel fuels are already being used in small numbers of federal, state, municipal, and school bus fleet vehicles across the Commonwealth and across the country; and

WHEREAS, experienced knowledge and research regarding biodiesel fuel is still relatively limited in the nation and the Commonwealth and it is still uncertain whether biodiesel fuel may create operational challenges and problems for users of diesel-powered engines; and

WHEREAS, the federal government is requiring a reduction in sulfur for most diesel fuels beginning in 2006, which raises concerns whether fuel lubricity and biodiesel in low blends of fuels can be a lubricity option for future diesel fuels; now, therefore, be it

RESOLVED by the House of Delegates, the Senate concurring, That the Secretary of Agriculture and Forestry be requested to study the use and production of biodiesel fuel in the Commonwealth.

The Secretary of Agriculture and Forestry shall pay particular attention to the capability and desirability of generating a minimum demand of 20 million gallons annually in the Commonwealth. The study should include analysis of the economic impact its use would have on the state, the agricultural community, petroleum marketing and distribution, and biodiesel consumers, as well as the supply of biodiesel fuel and demand for biodiesel fuel in the Commonwealth. The Secretary shall consider the operational impact of biodiesel fuel on (i) engines and engine warranties; (ii) fuel economy; (iii) standards and testing methods of biodiesel

fuel; (iv) the energy expended to produce such fuels; (v) the environmental benefits and impacts on air quality in nonattainment areas of the Commonwealth; (vi) the marketing of biodiesel fuel by the agricultural and industrial communities; (vii) the potential for public use within the Commonwealth and its political subdivisions; (viii) its feasibility in cold flow conditions, (ix) tax incentives or credits to promote the use of biodiesel fuel, (x) storage, blending, transportation, and distribution; and (xi) the current supply and potential for biodiesel plants to be located within the Commonwealth.

The Secretary shall seek input from interest groups possibly impacted by increased biodiesel fuel use in the Commonwealth, including but not limited to petroleum suppliers, distributors, and transporters; diesel users, such as trucking, rail, bus and fleet vehicles businesses; biodiesel advocacy groups; and agricultural interest groups. The Secretary shall also consider similar studies and reports undertaken or completed in other states.

Technical assistance shall be provided to the Secretary of Agriculture and Forestry by the Department of Agriculture and Consumer Services. All agencies of the Commonwealth shall provide assistance to the Secretary of Agriculture and Forestry in studying the use and production of biodiesel fuel in the Commonwealth, upon request.

The Secretary of Agriculture and Forestry shall submit to the Division of Legislative Automated Systems an executive summary and its findings and recommendations on biodiesel fuel use and production in the Commonwealth no later than the first day of the 2006 Regular Session of the General Assembly. The executive summary and the findings and recommendations shall be submitted for publication as a report document as provided in the procedures of the Division of Legislative Automated Systems for the processing of legislative documents and reports and shall be posted on the General Assembly's website.