FINAL REPORT

INTRODUCING BIODIESEL INTO THE MARINE MARKET – PHASE I: FLORIDA KEYS

October 16, 1995

Introduction:

This project was originally initiated by Russ Teall after reading an article on the Sunrider Expedition in a marine trade publication, Soundings Trade Only. Mr. Teall is the owner of Teall's Guides/Global Cartographics and is the immediate past president of the National Boat Owners Association. After reading the Sunrider Expedition article, Mr. Teall contacted Kenlon Johannes and Alan Weber of the National Biodiesel Board (NBB) to discuss the potential for biodiesel in the marine market. As a result of their conversations, it was concluded that there was sufficient interest in marine applications for biodiesel to warrant a test market survey.

Proposal:

A proposal to conduct a test market survey of biodiesel in the Florida Keys was submitted to NBB by Mr. Teall on February 23, 1995 and the project was approved to begin on June 1, 1995. The market survey and associated fuel trials were completed by September 15, 1995 and the Final Draft Report was submitted to NBB on October 11, 1995.

Funding:

This project was funded by the Minnesota Soybean Research and Promotion Council.

OBJECTIVES

Summary:

The objective of this project was to cover the following areas with an emphasis upon establishing retail awareness, demand, and distribution of biodiesel in the marine market. The Phase I program used three locations in the Florida Keys as the initial venues for creating a program and materials which can be used to obtain the same objectives in other areas. This section merely outlines the objectives. The attainment of these "Objectives" is covered in the later sections of this report entitled "Methodology," "Report," "Recommendations" and "Conclusions" and also in the Appendices.

Publicity:

Conduct press conferences, editorial board meetings and receptions to introduce the press, government officials and business and marine leaders to biodiesel.

Fuel Trial Sites:

Arrange for marine fuel docks at three locations (two in Marathon and one in Key Largo) to obtain and distribute biodiesel via readily accessible channels as part of the Biodiesel Fuel Trial and Discount Coupon Promotion.

Events:

Conduct events designed to raise consumer awareness and use of biodiesel fuel.

Conduct events designed to educate consumers about the use of biodiesel with particular emphasis upon the varying effects of neat versus blends.

Conduct events to test the effectiveness of Free Fuel Trials versus Discount Coupon Promotions for introducing biodiesel into the marine market.

Survey:

Survey and analyze the method of potential biodiesel sales (neat vs. Blends).

Identify advantages/disadvantages of biodiesel use in the marine industry and research needed to attain optimal market penetration.

Recommendations:

Develop recommendations for the NBB in relation to future research and educational activities.

Overriding Objective:

The overriding objective for conducting the entire program was to provide a practical emphasis upon:

1. Determining the current level of interest in and awareness of biodiesel fuel.
2. Identifying regulatory issues affecting diesel fuel distribution.
3. Identifying fuel distribution networks in each geographic area.
4. Identifying issues of concern regarding biodiesel fuel.
5. Comparing biodiesel fuel to alternative fuels, with an emphasis on economic, technical, and environmental variables.
6. Identifying research and educational needs to satisfy the concerns raised by the marine trade and consumers.
7. Estimate the volume of demand for biodiesel fuel, considering economic, interest and awareness variables.

METHODOLOGY

Overview:

One of the objectives set forth for this project was to develop a methodology for conducting future biodiesel fuel trials in other locations. The methodology outlined here is generally applicable for this purpose, although some modifications may be needed to take advantage of local situations and opportunities.

Pre-Event Preparation:

Permitting: Local permitting requirements need to be examined and complied with prior to site contracting.

Site Contracting: Site Contracts need to be executed and firm dates set for the promotional events prior to pre-event publicity being initiated.

Shipping: Arrangements for biodiesel fuel to be shipped and stored near the fuel dock sites need to be made prior to pre-event publicity being initiated. In most cases shipping can be by common commercial carrier and storage can be at the fuel dock site.

Pre-event Promotion:

Press Releases: Press releases should be sent to all local and regional media and marine trade associations at least two weeks prior to the promotional event.

Interviews: Background interviews with newspaper editors and radio and television newsroom directors need to be conducted to supplement the exposure from the press releases.

Posters: At least one week prior to the promotional event posters need to be displayed at local marinas, yacht clubs, marine businesses, and other public gathering places.

Public Appearances: Presentations about biodiesel and the biodiesel promotional event should be made at marine trade meetings, yacht clubs and chambers of commerce prior to the event. On the air radio interviews, live or pre-recorded, should be scheduled for the week prior to the event.

Biodiesel Free Fuel Trials:

Biodiesel Free Fuel Trials allow participating boat owners to receive free biodiesel with their regular fuel purchase. Participants are given a copy of biodiesel fuel facts and asked to fill out a registration form and to answer some survey questions after they have tried biodiesel.

Discount Coupon Promotion:

Discount Coupon Promotions allow participating boat owners to purchase biodiesel at predicted retail rates ($3 per gallon). Participants are given a copy of biodiesel fuel facts and asked to fill out a registration form and to answer some survey questions after they have tried biodiesel. Upon receipt of the survey the participants are given a coupon good for free biodiesel equal to the amount which they purchased.

Other Special Events:

Environmental Conferences: Because of the rising level of concern about protecting the marine environment, many counties, trade associations and other groups conduct local conferences on topics such as recycling, waste management, growth management and resource protection. These are excellent opportunities to deliver the biodiesel message to a receptive audience and to set up future fuel trials and distribution networks.

Environmental Activities: Periodic environmental events such as coastal cleanups and reef sweeps are also good opportunities to deliver the biodiesel message. Sponsorship costs are usually minimal and the media exposure can be significant. Donation of biodiesel to participating cleanup vessels can be part of the biodiesel fuel trials.

VIP Reception: Inviting local politicians, celebrities, community leaders and media to a reception and biodiesel demonstration can be used to raise awareness of biodiesel in an area and to generate publicity.

Boat Shows: Boat shows provide an excellent opportunity to reach a large number of boat owners and could be coupled with in-the-water demonstrations to provide a direct experience with biodiesel.

REPORT

Implementation of Test Market Proposal: This section will show how the methodology was used to obtain the objectives, set forth earlier in this report, as they apply to the Florida Keys.

Step 1 - Permitting Requirements

Legal work and permitting questions were handled by the local law firm of Greenman and Manz. After basic legal research was completed, information from the “Biodiesel Information Kit” was submitted to the relevant regulatory agencies, including the Monroe County Code Enforcement and the Florida Department of Environmental Protection (DEP). Neither agency had any objections to biodiesel being stored in portable above ground containers of less than 500 gallons so long as there was no spillage. Storage in either 55 gallon drums or tote tanks is permissable. *As a side note, both the County and the State are interested in trying biodiesel with the possibility of including it as a “first choice” environmentally friendly product. This would mean that if biodiesel were available, it would be required instead of petroleum diesel. DEP guidelines for this special designation have been requested*.

Step 2 - Contracting with Fuel Docks

There was no reluctance on the part of fuel dock operators to participate in either the Free Fuel Trials or the Discount Coupon Program. The Site Contracts were simple and provided the basis for a working relationship between the biodiesel project coordinator and the fuel dock operator. The fuel dock operators liked the fact that they would be included in the press releases and other promotions and that they would be perceived as proactively concerned with the environment.

Three fuel docks participated in the biodiesel promotions. Two were located in Marathon, where the Biodiesel Fuel Trials were held, and one was located in Key largo, where the Discount Coupon Promotion was held.

Step 3 - Shipping of Biodiesel
It was necessary to complete steps 1 and 2 before shipping the biodiesel. Shipping the biodiesel from Jacksonville to Marathon and Key Largo was done by common commercial carrier. Properly labeled biodiesel drums ensured that no regulatory problems were encountered during shipping. *It should be noted that shipping in 55 gallon drums is the least cost effective method of shipping and that future regional market tests could be supported by a larger tank shipment to a common central holding area.*

Step 4 - Press Releases and Radio Interviews
Press releases were drafted and then approved by NBB prior to being sent to the media and local trade associations. These press releases were followed up with meetings with the editors, writers, reporters, and news directors responsible for covering this type of event. This resulted in substantial newspaper, radio, and television coverage for biodiesel, the biodiesel promotions and the Sunrider Exhibition (as summarized in Appendices B & C).

Step 5: Presentations
Presentations were conducted in numerous locations throughout the Keys. In addition, meetings with the boards and the membership of the Marine Industries Association of Florida, the Marine Industries Association of South Florida and the Middle Keys Marine Association were conducted. The public presentations and exhibitions by Bryan Peterson and the Sunrider were well received and helped generate substantial publicity.

Step 6: Posters
Hundreds of promotion posters were displayed at prominent locations throughout the Keys. This was a very effective and inexpensive means of informing interested boat owners about the upcoming Biodiesel Fuel Promotions and the Sunrider Expedition.

Sunrider Expedition:
Although Bryan and Sunrider have been mentioned previously, their contribution to the acceptance of biodiesel in the marine market deserves reemphasis. Bryan conducted many presentations and set up the Sunrider Exhibition at numerous prominent locations in the Keys. This was very helpful in attracting media and direct public attention to the biodiesel fuel promotions. Bryan brings a great deal of creditability to the use of biodiesel in the marine market through his extensive and exciting personal experiences. Audiences respond very favorably to his presentations. His presence at

the launch of future biodiesel fuel trials would have a significant impact on generating positive publicity and public participation.

Biodiesel Free Fuel Trials:
The Biodiesel Free Fuel Trials were scheduled at two participating Marathon area fuel docks for the weekend of June 24-25, 1995. Participating boat owners received free biodiesel with their regular fuel purchase and were given a registration form and survey to complete. The event was promoted by extensive free newspaper and radio coverage.

Discount Coupon Promotion:
The Discount Coupon Promotion was scheduled at one participating Key Largo area fuel dock for Saturday, July 1, 1995. Participating boat owners were allowed to purchase biodiesel as predicted retail rated ($3 per gallon) and were given a registration form and survey to complete. Upon return of the survey the participants were given a coupon good for free biodiesel equal to the amount which they purchased.

Other Special Events:

Clean Marinas Conference: The Clean Marinas Conference was held in Key West on June 22023, 1995, the two days leading up to the first fuel trial. Kenlon Johannes was a featured speaker at the conference. The Biodiesel Information Kiosk and the Sunrider exhibition were prominently displayed during the entire conference.

Project Reef Sweep: Project Reef Sweep is an annual event during which commercial fishermen and recreational scuba divers work together to clean debris off the living coral reefs in the Marathon area. The Biodiesel Fuel Trials were held in conjunction with Project Reef Sweep in order to generate greater publicity and to associate biodiesel with commercial and environmental interests simultaneously. The Biodiesel Information Kiosk and the Sunrider Exhibition were on display at Marathon Marina during Project Reef Sweep.

VIP Reception:
A VIP reception was held at the Pigeon Key Historic Site on the evening of Saturday, June 24, 195. The Biodiesel Information Kiosk was on display, along with the Sunrider Exhibition. Presentations were made by Russell Teall,
Kenlon Johannes, and Bryan Peterson*. Bryan and Kenlon were made "Honorary Conchs" (the name for Keys natives) by proclamation of the County Commissioners at the reception.* Local VIPs were in attendance, including Monroe County Commissioners, Marathon Chamber of Commerce board members, Economic Development Council directors and local newspaper and radio reporters.

It should be noted that although drinking of biodiesel is not encouraged or recommended, one County Commissioner (who also agreed to use biodiesel in his sailboat's engine) proceeded to open and drink the sample bottle of biodiesel before he could be stopped. He reported no ill side effects either personally or in his vessel.

Pigeon Key is powered solely by a diesel generator, and a spontaneous photo opportunity was created when Kenlon Johannes and Brian Schmitt (Marathon Chamber

of Commerce President) put biodiesel in the generator's tank for the event that evening.

Boat Show: Biodiesel and the biodiesel fuel trials were promoted at the June Coconut Grove Boat Show in Miami. Boat shows are an excellent opportunity to reach a large number of boat owners and could be coupled with in-the-water demonstrations to provide direct experience with biodiesel.

Biodiesel Fuel Trial Registrations - Who Participated?

Overview:
In order to receive biodiesel each participant was required to fill out a registration form. No one objected to filling out the forms and most people seemed eager to talk about their boats. The only reluctance to participate in the fuel trials was from commercial fishermen, people that were operating someone else's vessel, and those people unwilling to pay for biodiesel as part of the fuel trials. There were thirty participants in the biodiesel fuel trials that completed registration forms.

Obstacle - Reluctance of Commercial Fishermen:
The first fuel trials in Marathon went very smoothly and were well attended. There was extensive media coverage in the newspapers and on the radio leading up to the trials. Generally we found commercial fishermen to be the most reluctant to try biodiesel. Because their livelihoods depend upon the reliability of their engines, their opinion seemed to be to let someone else try it first and then they would consider using it. We did have several commercial fishermen participate in the fuel trials and their positive experiences with biodiesel should help sway the other fishermen.

Other Groups Willing to Try Biodiesel:
Other user groups seemed more willing to try the biodiesel and so there is a good cross section of participants presenting the marine industry, sailing charters, yacht charters, fishing charters, scuba diving charters, recreational fishermen, recreational sailors and research vessels. Some biodiesel was set aside specifically for tour boat operators and the NOAA research vessels. Some prominent individuals participated in the fuel trials, including one of the Monroe County Commissioners, the President of the Florida Association of Dive Operators, the President of the Chamber of Commerce, and the Founder of Reef Relief. A soybean farmer, who was visiting the Keys on vacation and attended a biodiesel presentation at the Upper Keys Sailing Club, also participated in the biodiesel fuel trials.

Cruising Yachtsmen From Outside the Keys Try Biodiesel:
One unanticipated outcome of the Marathon fuel trials was that some of the participants were not from the Keys, but rather from other areas around Florida. They were passing through the Keys, heard about the biodiesel fuel trials, and decided to try biodiesel on their return trips home. Hopefully they will also be carrying with them a positive message about biodiesel back to their home ports. Our follow-up interviews with them will provide the basis for press releases to their local papers.

Discount Coupon Program is not as Effective:
The fuels trials in Key Largo did not have the same draw and impact as the free fuel trials in Marathon. One obvious factor was that participants were required to purchase

the fuel in order to try it. There was one participant for the discount coupon program compared to twenty-none for the biodiesel free fuel trials. On a positive note, the owner of the discount coupon fuel trial site, Gilbert's Resort and Marina, wants to carry biodiesel commercially. He feels that there is a tremendous potential to sell biodiesel once there is a consistent exposure and supply.

Fuel Trials and Discount Coupon Promotion Raised Awareness:
The fuel trials and discount coupon program have greatly increased the awareness in the Keys about biodiesel. As a result of these promotions there is sufficient demand to seriously consider opening up lines of supply.

Participant Profiles:
Participants represented both power (21) and sail (9), and commercial (15), recreational (13), research (2), and government (1). Some biodiesel was set aside for use by the government owned research vessels of the National Oceanic and Atmospheric Administration's Florida Keys National Marine Sanctuary. Their participation, although with only one vessel, was significant in terms of setting an example and adding credibility.

Vessel Types:
Many varieties of vessels participants in this project, ranging from small sailboats to larger commercial fishing boats. The age of the participating vessels spanned 60 years, ranging from 1926 to 1986 with the average year built being 1976.
The lengths of the participating vessels ranged from 27' to 65' with an average length of about 38'.
The horsepower of the participating vessels ranged from 12 hp to 1,000 hp.
The number of gallons of fuel used per year ranged from 50 to 5,000 with an average of about 500.
The fuel tank capacity of the participating vessels ranged from 12 gallons to 1,000 gallons.
Most vessels were powered by single engine and only four had twin engines.
The blends of biodiesel to petroleum diesel ranged from 100% pure to 20% with an average blend of 24%.
Nine hundred gallons of biodiesel were used in the fuel trials with a range per vessel engine of 6 gallons to 100 gallons with an average of 25 gallons.

Who were the participants?
The captains and owners of the vessels involved in this project represent a diverse background, ranging from modest to substantial with an average around $50,000 to $75,000. A summary of participants is listed below:
Boy Scouts of America Sailing Program (1)
County Commissioner (1)
Chamber of Commerce President (1)
Chairman of Key West Port & Transit Authority (1)
President of Florida Association of Diver Operators (1)
Charter Diving (2)
Charter Excursion (1)
Charter Fishing (2)
Charter Sail (1)
Commercial Fishermen (5)

Dockmaster (1)
Marina Operator (1)
Marine Industry (2)
NOAA Research Vessel (1)
Realtor (1)
Shell Oil Executive (1)
Soybean Farmer (1)
Vacation Sail (5)
Vacation Power (6)

Biodiesel Survey Results - A Review of Survey Questions and Responses

1. Where and when did you first hear about biodiesel? Only three participants had heard about biodiesel prior to the exposure generated by these fuel trials. One of them was a soybean farmer. The four most mentioned sources for information about the biodiesel fuel trials were the newspapers, radio, Bryan Peterson's presentations, and posters. It should be noted that some of the participants heard about biodiesel and the fuel trials for the first time when they showed up at the fuel dock to refuel and saw the fuel trial display.

2. Prior to trying biodiesel did you have any concerns about using it? Most potential participants showed both an initial reluctance and curiosity about using biodiesel. After reading the literature and talking to a biodiesel representative most everyone's concerns were answered. Again, the only reluctance which could not be overcome was from some commercial fishermen, people using someone else's vessel or people that did not want to pay for biodiesel as part of the fuel trials.

3. How did your vessel perform using biodiesel? None of the participants have experienced any difficulties using biodiesel and most are very enthusiastic about its potential. Only one participant indicated a minor difference when starting his engine. He observed that his engine took an additional revolution or two before it "caught." He also noticed that his exhaust temperature seemed to be cooler. *One charter fishing captain said that his customers noticed the "popcorn smell" of his exhaust and that it made them so hungry that he ran out of food.*

4. What do you see as the primary benefits of using biodiesel? Improved exhaust and fuel smell, reduced soot and environmental friendliness were cited overwhelmingly as the primary benefits of using biodiesel.

5. After trying biodiesel, do you have any concerns about the use of the fuel? After trying the fuel and experiencing no difficulties, all participants agreed that their short term concerns about the effect of biodiesel on their engines were alleviated. However, there is still some concern about the long term effects, both harmful and beneficial, of prolonged use of biodiesel. In addition, many participants expressed concern about the availability and price of biodiesel. These concerns are more fully addressed in questions #8 to #11.

6. Comparing biodiesel to petroleum diesel, please choose which fuel you feel best meets the following statements:

a. Safer in the event of a spill
   Biodiesel - 27 Petroleum Diesel - 0 No Opinion - 0
b. Provides lower exhaust emissions
   Biodiesel - 27 Petroleum Diesel - 0 No Opinion - 0
c. Provides better engine lubrication
   Biodiesel - 5 Petroleum Diesel - 3 No Opinion - 19
d. Is less likely to cause engine problems
   Biodiesel - 0 Petroleum Diesel - 2 No Opinion - 25
e. Is safer for human to use
   Biodiesel - 27 Petroleum Diesel - 0 No Opinion - 0
f. Is a renewable resource
   Biodiesel - 27 Petroleum Diesel - 0 No Opinion - 0
g. Causes less environmental damage during production
   Biodiesel - 26 Petroleum Diesel - 0 No Opinion - 1
h. Reduces dependence on foreign suppliers
   Biodiesel - 26 Petroleum Diesel - 0 No Opinion - 1
i. Exhaust odor is more pleasant
   Biodiesel - 26 Petroleum Diesel - 0 No Opinion - 1

It is significant that all of the participants consistently rated biodiesel as superior to petroleum diesel. It is perceived to be safer in the event of a spill, to provide lower exhaust emissions, to be safer to humans to use, to be a renewable resource, to cause less environmental damage during its production, to reduce dependence on foreign suppliers, and to have a more pleasant exhaust and fuel odor.

The only areas of uncertainty were indicated by the large number of “no opinions” regarding engine lubrication and engine problems. In light of the lubricity studies indicating a strong factual basis for the superiority of biodiesel versus petroleum diesel there is an opportunity to shift the public perception on this issue*. In terms of engine problems, longer term studies are needed in real life applications that can be highly publicized. In addition, stronger unequivocal acceptance by diesel engine manufacturers is needed.* It should be noted however that neither of these issues prevented all of the participants from indicating that they would recommend biodiesel to a diesel and that they would be willing to participate in future fuel trials. “Lubricity and engine problems” could become more of an issue for a percentage of the market being asked to purchase biodiesel at prices exceeding petroleum diesel.

7. Would you recommend biodiesel to a friend? One hundred percent of the participants indicated that they would recommend biodiesel to a friend.

8. Would you buy biodiesel if it were available at the same price as petroleum diesel? One hundred percent of the participants indicated that they would buy biodiesel if it were the same price as petroleum diesel.

9. Would you buy biodiesel if it were available at a slightly higher price than petroleum diesel? Eighty-five percent of the participants indicated that they would pay slightly more for biodiesel. Although almost everyone asked, “How much more do you mean by slightly?”

10. Studies have shown that a 20% blend of biodiesel with 80% petroleum diesel most efficiently provides many of the benefits of biodiesel. Would you buy biodiesel as a 20% blend with petroleum diesel if it added only $.30 per gallon to the price? Seventy percent of the participants said they would pay $.30 per gallon more for a 20 percent biodiesel blend. The other 30 percent were largely commercial fishermen or high volume fuel customers that felt that they could not afford any increase in fuel prices.

11. Would you buy 100% biodiesel if it were available at twice the price of petroleum diesel? Forty percent of the participants indicated that they would be willing to pay double the price for biodiesel. Most of these participants had vessels with smaller engines and lower fuel consumption or were charter boat captains that saw a benefit for their passengers. Most indicated that they would blend it with petroleum diesel to keep the price down. The 60 percent that would not pay double for biodiesel had vessels with larger engines that were high volume consumers. Every commercial fisherman said they would not pay double. The remaining participants, including some of those that were willing to pay $.30 per gallon more for a blend, would not pay double for 100% biodiesel. This suggests an interesting marketing approach regarding pricing. The price is the same for a 20% blend at $.30 a gallon increase versus 100% biodiesel at double price which is then blended. The perception however is that a $.30 per gallon increase is less!

12. Are you concerned with liability in the event of an oil or fuel spill? Only one of the participants was not concerned about an oil or fuel spill.

13. Does your boat insurance cover you in the event of an oil or fuel spill? Responses were evenly mixed between “yes,” “no” and “I don’t know.” Many of the yes responses indicated that even though they had coverage they did not think it was enough to cover them fully in the event of a spill. Roughly thirty percent of the participants had no boat insurance at all.

14. How much is your current annual boat insurance premium? Seventy percent of the participants had boat insurance with an average annual premium of about $900.

15. Did you read the Fuel Fact sheets that were given to you at the Biodiesel Fuel Trials? Virtually everyone read the fuel facts since it was required before they received the biodiesel. Some participants, however, forgot that they had to read it.

16. Do you have any suggestions for future Biodiesel Fuel Trials? People would like to have the biodiesel brought to their docks at home, at their marina or at their yacht club. Several participants suggested that future trials should be conducted on a long-term basis to determine engine wear, efficiency, operating temperature and power.

17. Do you have any comments about how the Biodiesel Fuel Trials were conducted? All participants had favorable comments about how the fuel trials were run. There were no spills in the water or on the boat. The biodiesel representatives were courteous and professional.

18. Would you like to receive a summary of the results of this survey? All participants indicated that they would like to receive copies of the survey. Some participants are very interested in distributing biodiesel information.

19. Would you be interested in participating in future market testing of biodiesel fuel? All participants indicated that they would be willing to participate in future biodiesel fuel trials if they were convenient.

20. How would you rate your annual household income? The average income of fuel trial participants was approximately $50,000 to $75,000.

Review of Program Results

General Impressions

Although most mariners are not yet aware of biodiesel, they are receptive to the product. Initial reluctance to try biodiesel is easily overcome through demonstrations of the product and distributions of factually oriented literature. Participants perceive many strong benefits of using biodiesel versus petroleum diesel, although some questions remain about the long term effects of using biodiesel. These concerns can be resolved by prolonged demonstration projects and unequivocal support from engine manufacturers. In addition, a product certification standard could be developed by the National marine Manufacturers Association (similar to the TCW3 two stroke oil standard) which would make it easier for engine manufacturers to accept and endorse the use of biodiesel in their engines.

The fuel trials went smoothly and there was uniform support from the marine industry, fuel dock operators, and boat owners. The Free Fuel Trials were much more effective than the Discount Coupon Program in attracting participants and generating positive responses.

In promoting this program significant press coverage was generated resulting in a greatly increased awareness by industry and consumers of the positive benefits of biodiesel.

Given the current pricing of biodiesel, the best markets will be small volume users, charter boat operators, and possibly government/research vessels. If economics of scale can eventually be realized and the price of biodiesel reduced the market for biodiesel will expand.

The biggest obstacles at this point seem to be price and availability.

Conclusions

Promotional Coverage: Extensive coverage of the biodiesel fuel trials can be generated through a dedicated public relations campaign based upon press releases, editorial board meetings, interviews, and follow-up phone calls. There is a high degree of interest in biodiesel which can be tapped with a concerted effort prior to a special event such as the Biodiesel Fuel Trials. It is helpful to have local dignitaries or celebrities use biodiesel.

Sunrider: The Sunrider presentations were very effective in generating media interviews regarding biodiesel generally and the Biodiesel Fuel Trials in particular. If possible Bryan Peterson and the Sunrider should be used in future biodiesel fuel promotions.

Free Fuel Trials versus Discount Coupon Promotion: The Free Fuel Trials were very effective in generating initial interest in trying biodiesel which was then converted to genuine excitement about obtaining and using biodiesel. The Discount Coupon Program was not readily accepted because too little was known about biodiesel, especially from first person reports by credible local interests. There is an apparent reluctance on the part of consumers to buy biodiesel until they have tried it themselves or know someone who has tried it. It may be that as familiarity with biodiesel grows it will be possible to enter new geographic markets without first using the Biodiesel Free Fuel Trials. For the time being, however, Free Fuel Trials should precede the sale of biodiesel.

Potential Market: There is wide support for the use of biodiesel in most recreational and governmental categories. Commercially, charter fishing and diving operators that deal with the public in environmentally sensitive areas are also receptive to the use of biodiesel. Commercial fishermen seem to be the most receptive to try or use biodiesel.

Price and Availability: Price and availability will be the two principal problems to address in attempting to expand the market for biodiesel. Most participants in the fuel trials seemed receptive to paying $.30 per gallon more for a 20% biodiesel blend (even though the math at $3 per gallon for 100% pure biodiesel is roughly the same). Prices higher than this will meet with resistance, although there will be some categories of users such as sailboat owners and government research vessels that would possibly be willing to pay much more. As with most products, demand will be greater if the price is lower.

Availability is the other major problem to address and it is directly related to pricing. Lines of supply and volume discounts, if left to market forces, will be slow to develop. Initial low volume of startup demand will equate to higher price which will inhibit the acceleration of demand. Strategies should be developed for initially supporting demand with higher volume supplies and lower prices to stimulate the more rapid growth of demand.

Recommendations

Product, Packaging, Marketing, and Promotion

A Comprehensive, Integrated Marketing Program: This demonstration project has shown that boat owners like biodiesel and will purchase it at the right price. The objective now should be to create an integrated marketing program for promoting and distributing biodiesel. The recommendations outlined below can be implemented separately but would have the greatest synergy and effect if they were undertaken simultaneously as part of a comprehensive marketing strategy.

Overcoming the Price Hurdle: The most significant obstacle is the perceived high price of biodiesel when compared to petroleum diesel. Unless price can be significantly

reduced, biodiesel will need to be packaged and promoted in a way which clearly distinguishes it from petroleum diesel and compares it favorably with other “high priced” products. Similar products include fuel additives and two stroke lubricating oils which retail for $8 to $15 per gallon and more.

Biodiesel as a Fuel Additive: As a fuel additive, biodiesel can be packaged and distributed in quart, gallon, and five gallon reusable containers relatively easily. A one time deposit on the container would reduce future packaging costs and support the environmental concepts which lie at the foundation of biodiesel’s popularity. The most receptive market initially will be the small volume user and charter operator that will be blending biodiesel with petroleum diesel.

Biodiesel in Containers is more Easily Marketed by Retailers: By initially packaging biodiesel in reusable containers, consumers can buy biodiesel not only at fuel docks but also at marinas, marine stores, auto parts stores or at their yacht clubs. (This marketing approach would also target land-based users of diesel such as forklifts, travel lifts, automobiles and trucks.)

The initial expense for a fuel dock operator to acquire a tote tank and a certified, calibrated pump is significant. Once demand and awareness for biodiesel increases through the sale of packaged biodiesel, dealers could progressively increase their inventory and profit margin by using drums, tote tanks, or larger volume tankage knowing that a market exists.

Legal and Taxation Issues: As the NBB Marine Marketing Committee discussed during their September 1995 teleconference, there are still unresolved biodiesel taxation and legal issues which need to be addressed when biodiesel is pumped and sold to consumers at marine fuel docks. Some of these potential problems may be eliminated if biodiesel is sold as a fuel additive in containers over the counter. Further legal research on retail taxation issues and dispensing requirements (calibrated pumps, disposal fees, environmental compliance) needs to be undertaken.

Implementation: The objective of all of these recommendations is to develop a biodiesel distribution program which will keep the perceived price of biodiesel reasonable and will make it easy for retailers to carry the product.

Until the market is more fully educated, pumping biodiesel next to petroleum diesel will cause the consumers to focus on the price differential between the two fuels. As a fuel additive, biodiesel will be perceived differently and will not have to be positioned in competition with lower priced petroleum diesel.

Generally, implementation would require a central holding facility for bulk biodiesel in Florida, a container fill operation and a sales and distribution network. Creative support would be needed to develop proper packaging, labeling, collateral material and in-store displays for biodiesel. Sales and administrative support would then be needed to set up 200 targeted “on consignment” marine outlets throughout Florida. Initial demand for biodiesel could be met by these outlets with estimated volumes of 100 to 1,000 gallons per outlet (with a total first year volume state-wide of 10,000 to 100,000 gallons). The success of this would depend in part on additional support through advertising, boat show promotions, demonstration programs, and free fuel trials.

This program could be implemented in Florida during the winter and spring of 1995-1996. If it is successful in Florida, a similar program could be rolled out to other regions in time for the summer of 1996 boating season.

Expand Biodiesel Fuel Trials in Other Areas

Expand Fuel Trials to Cover All of Florida: The Biodiesel Fuel Trials should be expanded to other major metropolitan areas of Florida during the coming winter season. Targeted cities should be Fort Lauderdale, Jacksonville, St. Petersburg, and Pensacola. Based upon the success and experiences of the Florida Phase II studies, a national roll-out plan should be developed for the Summer of 1996.

Field Trials Should Also Include Marinas, Yacht Clubs, and Discretionary Allocations: Although fuel trials should still be conducted at fuel docks, other sites such as marinas and yacht clubs should be utilized. In addition, specific charter operators and government/research vessels should be targeted.

Demonstration Projects – Boat Shows, Water Taxis, and Marine Towboats

Demonstration projects seem to be the key to developing consumer acceptance of biodiesel. There are over 26 boat shows per year in Florida. A Cooperative program with the Marine Industries Association of Florida could be created for promoting biodiesel at their affiliated boat shows. Diesel powered water taxis, marine towboats, or other vessels accessible for demonstrations could be a promotional highlight of these shows for the near future.

Long-Term Demonstrations - Twin Diesels

Several of the Biodiesel Fuel Trial participants that own twin diesel powered vessels have indicated a willingness to participate in future marketing studies. By running a biodiesel blend in one engine and regular petroleum diesel in the other, valid long term comparisons of the two fuels could be made under nearly identical circumstances. This could result in convincing research reports that would sustain the long term acceptance of biodiesel. It would be especially persuasive if one of these demonstration vessels could be used in conjunction with boat show promotions and future fuel trials.

Manufacturer Endorsements:
Diesel engine manufacturers may be interested in participating in the long term demonstration or in conducting in-house research on the long term effects of biodiesel. Their endorsement and support of biodiesel is crucial. Given the increasing demands by the EPA and consumers for more environmentally friendly engines, it may be crucial for diesel engine manufacturers to embrace biodiesel.

NMMA Certification:
The National Marine Manufacturers Association has established certification standards for many marine products including boats, trailers, and two stroke oil. At the current time there is no NMMA standard for the marine use of biodiesel fuel. It approached properly NBBA could be encouraged to research and develop such standards in cooperation with NBB.

NMMA deals with many environmental issues because it is in the long term interest of its members. Involvement with an environmentally friendly fuel such as biodiesel could become an active priority for the NMMA.

Potential New Product:

The possibility of processing soybean oil for use as two-stroke-out -board engine oil was mentioned by several fuel trial participants. Most marine outboards are gasoline powered two-stroke oil. The industry standard TCW3 oil retails for $8 to $15 per gallon. All two-stroke oil burns poorly and makes smoky exhaust which is then mixed with cooling water and discharged into lakes, rivers, and oceans. If soybean oil could be used to make a low pollution, non-toxic alternative to petroleum based two-stroke oil, there would be a huge market.