

**BIOHEAT<sup>®</sup> ACTIVATION GUIDE**

Bioheat<sup>®</sup>, the  
**EVOLUTION**  
of Oilheat

You have the unique opportunity to deliver an exciting new liquid fuel to heat your customer's homes. It's called Bioheat<sup>®</sup> and it's smart and simple. Bioheat<sup>®</sup> is made from Biodiesel produced right here in the USA, so when you deliver Bioheat<sup>®</sup> you're actually making a difference in reducing our country's dependence on foreign oil and helping to create new American jobs. Best of all, Biodiesel is classified by the EPA as an advanced biofuel made from readily available, renewable resources. It is the domestic, sustainable, cleaner burning, heating oil replacement that meets strict national quality standards and specifications.

Your customers won't need to make any changes to their current heating or hot water systems. Bioheat<sup>®</sup> burns cleaner and is priced competitively with regular oilheat. Delivering Bioheat<sup>®</sup> today also improves the air we all breath.

Bioheat<sup>®</sup>, the evolution of oilheat activation playbook is a useful tool developed to aid you in making Bioheat<sup>®</sup> a part of your fuel offering. This guide addresses several topics that will help you understand how Bioheat<sup>®</sup> can help your business prosper into the future. In addition to this binder, you can also find useful information and tools developed specifically for Bioheat<sup>®</sup> Dealers at [www.bioheatonline.com](http://www.bioheatonline.com).

Thank you for your interest in Bioheat<sup>®</sup>. We look forward to working together with you to make Bioheat<sup>®</sup> the fuel choice for the future.

Bioheat<sup>®</sup>. It's smart and simple. It's the evolution of oilheat.

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## Biodiesel Education

As a registered Bioheat® marketer, it's important for you to understand the basics behind the product you sell. To understand Bioheat® you have to understand Biodiesel — the raw materials used in its production, the production process, the advantages and quality assurance guidelines.

### TOPICS COVERED IN THIS SECTION:

- > Biodiesel Definition
- > Biodiesel Production
- > Bioheat® & Biodiesel Advantages
- > Bioheat® Market Overview
- > Bioheat® & Biodiesel Quality Assurance

**Bioheat® QuickGuide:** The book has been formatted to provide you information as simply as possible. The first two pages in each section of this book has a "Quick Reference" guide that topline the content of the rest of the section.



# Biodiesel Education at a Glance

Bioheat® is Biodiesel blended with traditional heating oil. To understand Bioheat® you need to know about Biodiesel first.



## What is Biodiesel?

Biodiesel is a renewable energy resource made domestically from esters of long-chain fatty acids found in soy and other vegetable oils, recycled restaurant oils, and animal fats or tallow. To certify as Biodiesel, the fuel must meet current ASTM D-6751 requirements and be designated as B100.



## How is Biodiesel produced?

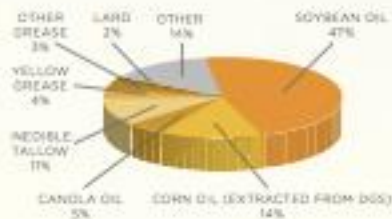
In a chemical process called transesterification, glycerin is separated from the fats or vegetable oils of the feedstock. The glycerin is sold for use in the manufacture of soaps and other household products. The remaining, purified methyl esters are in fact Biodiesel.

Biodiesel Production Process:



## What is Biodiesel made from?

Feedstocks that meet the ASTM quality specifications as defined under ASTM D-6751.



**Bioheat® QuickFact:** New feedstocks are emerging for Biodiesel production. Palm oil, Pennycress, algae, jatropha, low ricin castor and seashore mallow.

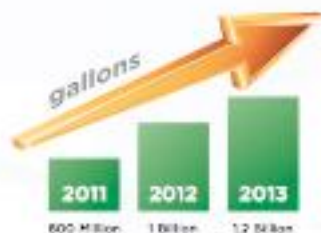
### Where is Biodiesel produced?

Independent production facilities across the nation are capable of producing more than 2 billion gallons of Biodiesel a year, using a variety of feedstocks. It is readily available through direct shipment from over 1,459 petroleum distributors and a few public pumps as well.



### How much Biodiesel is being produced?

With the EPA's commitment to renewable energy standards, the demand for domestic fuel alternatives and the growing endorsement of manufacturers, Biodiesel production is expected to rise considerably within the next few years. A billion gallons should be produced in 2012 and 2.5 billion gallons are expected to be produced by 2017.



Source: National Biodiesel Board Future Projections

### What are the Bioheat® market drivers?

#### Industry Facing

#### Significant Challenges:

- Housing Market Depressed

#### Conversions to Natural Gas:

- Perceived as cleaner Fuel
- Domestic Sources
- Huge Marketing Abilities
- Cost Differential

#### Heating Oil Market Goals:

- By 2030 all Oilheat will be ULSD with a 15% inclusion of Biodiesel.
- By 2050 all Oilheat will be B100 Biodiesel.



### Bioheat® and Biodiesel is quality assured.

BQ-9000® is a voluntary quality assurance program that accredits producers of Biodiesel. BQ-9000® promotes the success of Biodiesel, warrants that the quality is maintained at ASTM D-6751 specifications and helps monitor quality throughout the distribution system.

### BIOHEAT® ADVANTAGES?

#### Environmentally friendly

positive energy balance of 5.54:1.

**Promotes better air quality** and lowers toxic emissions vs. petroleum diesel.

**Decreases our country's dependence on foreign oil**, creates jobs and is good for the U.S. economy.

#### Healthy and safe

Passed EPA's Tier 1 and 2 health effects testing with flying colors.

**Virtually sulfur free** contains no nitrogen or offensive aromatics.

**Reduces nitrous oxide in boilers and home heaters.**

#### Highly efficient

Biodiesel has higher cetane level for more efficient ignition.

#### Highest BTU content for an alternative fuel contains 11% oxygen by weight

helps the fuel to burn cleanly and completely.

#### High lubricity (<300 HFRR)

enhance and extend equipment life and reduces HC, PM, CO in existing diesel engines.

**Requires no equipment retrofitting or modifications**

**Increases the time between maintenance.**

## Biodiesel Defined

Biodiesel is a domestic, renewable fuel for oil burners derived from natural oils like soybean oil, and which meets the specifications to ASTM D-6751.

Biodiesel can be blended with heating oil in existing burners with little or no modification. Biodiesel is not the same thing as raw vegetable oil. It is produced by a chemical process which removes the glycerin from the oil.

### Technical Definition for Biodiesel (ASTM D-6751) and Biodiesel Blend:

*Biodiesel, n*—a fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100 and meeting the requirements of ASTM D-6751.

*Biodiesel Blend, n*—a blend of Biodiesel fuel meeting ASTM D-6751 with petroleum-based diesel fuel, designated BXX, where XX represents the volume percentage of Biodiesel fuel in the blend.

It's a renewable energy resource that lowers toxic emissions and particulate matter. To be certified Biodiesel, the fuel must meet current ASTM D-6751 requirements and be designated as B100.

Biodiesel (B100) is simply a designation that was used to gain Biodiesel's acceptance by engine and fuel injection equipment manufacturers. The definition was needed to secure engine manufacturers and fuel injection equipment acceptance. It means that undesirable content (such as coal slurries, raw vegetable oils and fats and non-esterified oils) have been eliminated during production. Biodiesel blends combine specified percentage of Biodiesel (B100) fuel with petroleum-based diesel fuel and can be used in heating systems without modification.



### B100 ELIMINATES:

- Coal slurries
- Raw vegetable oils and fats
- Non-esterified oils
- Partially esterified oils
- Non ester renewable diesel

### B100 PROPERTIES:

- Renewable
- Positive energy balance, 5.54:1
- Biodegradable
- 10x less toxic than table salt
- High cetane (averages > 50)
- High lubricity (<300 HFRR)
- BTU content (118,000 to 120,000)
- Cold flow (feedstock specific)
- Flash point > 260° F
- No nitrogen or aromatics
- Virtually sulfur free
- Contains 11% oxygen by weight







# Feedstocks

Biodiesel is made from feedstocks that may be used to produce Biodiesel that meets the ASTM quality specifications as defined under ASTM D-6751.

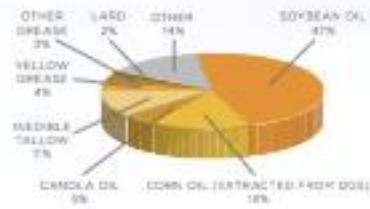
Currently 47% of Biodiesel is commonly made from soybean oil.

Another 14% is corn oil derived from a high nutrient livestock feed and co-product of ethanol production. 13% comes from animal fats and the remainder is a combination of canola oil, yellow grease, brown grease, and other materials. The majority of the materials are EPA approved. There are constantly new sources being explored, such as pennycress, algae, jatropha, palm oil, low ricin castor, and seashore mallow.

Feedstocks Used in Biodiesel Production: January – December 2010



Biodiesel Feedstocks in Marketing: 2012 – 2013



Source: National Biodiesel Board Future Projections

## PROGRESS WITH NEW FEEDSTOCKS

EPA APPROVED PATHWAYS OR UNDER REVIEW:





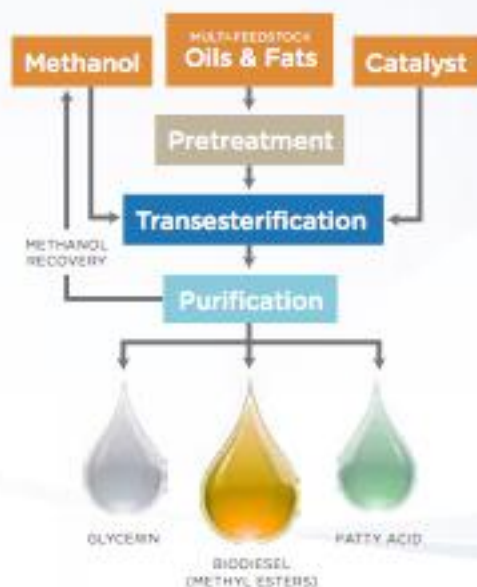
## Biodiesel Production

The chemical process known as transesterification produces Biodiesel when glycerin is separated from fats or other oils of the feedstock:

The glycerin is sold for use in the manufacture of soaps and other household products. The remaining, purified methyl esters are in fact Biodiesel. A Biodiesel blend is a blend of Biodiesel fuel meeting ASTM D-6751 with petroleum-based diesel fuel designated BXX, where XX is the volume percent of Biodiesel.

The Biodiesel production process is known as transesterification, which is the combining of vegetable oil or animal fat (100 lbs) with methanol or ethanol (10 lbs). Soybean, yellow grease, tallow & palm are the most common oils. Methanol, the alcohol & Sodium or Potassium Hydroxide act as the catalyst.

The Biodiesel Production Process:



### Renewable Fuel Standards-II Rule making Process:

Requires a "ramp-up" to 36 billion gallons of renewable fuel by 2022. There are four "nested" volume mandates: Renewable Fuel, Advanced Biofuel; Biomass-based Diesel; Cellulosic Biofuel.

EPA Proposed Rule 3: Biomass Based Diesel Fuel

- 2012 Volume obligation maintained at 1 billion gallons
- 2013 Volume obligation proposed 1.28 billion gallons

EPA broadens program to include diesel fuel and non-road uses (except ocean-going vessels) and to allow for credits for renewable fuel used in jet fuel and home heating oil.

Narrows definition of "renewable biomass", includes requirements for life cycle greenhouse gas (GHG) emissions reductions compared to baseline petroleum.

- Biodiesel is included as an Advanced Biofuel and Biomass-Based Diesel

### Distribution:

National Distribution Capabilities of Biodiesel

- Pipeline shipment development increasing
- Available through direct shipment from over 1,459 petroleum distributors nationwide.
- Approximately 1,321 retail filling stations nationwide, 200 locations are semi-truck accessible.
- Some 1,200 terminals cover the U.S. landscape, 224 handle Biodiesel nationwide, 93 automated for distribution.
- Numbers expected to grow with RFS2 implementation.



### U.S. Production Locations:

Production capacity is 2.0 billion gallons registered with EPA to meet required volumetric obligation.

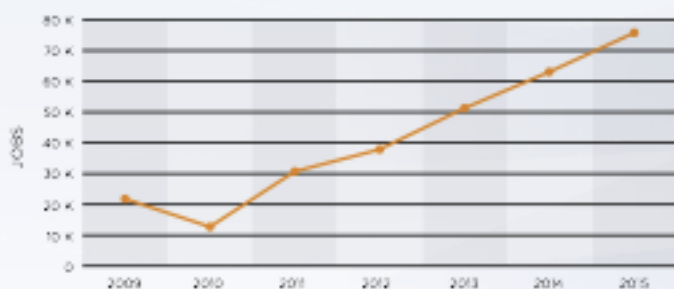


In 2011, the Biodiesel industry is on track to produce at least 800 million gallons. More than double Biodiesel production of 315 gallons in 2010, when Congress allowed Biodiesel tax incentive to temporarily lapse.

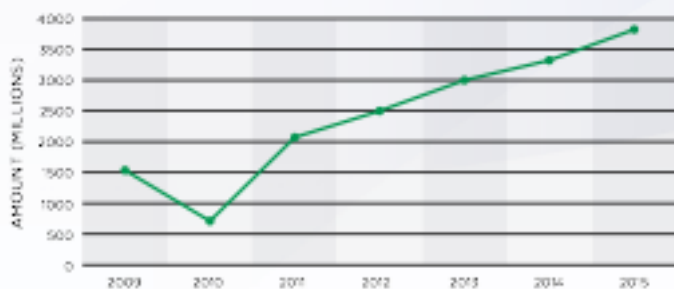
## Economic Study

According to a recent economic study, this year's rejuvenated production will support more than 31,000 U.S. jobs and generate income of nearly \$1.7 billion to be circulated throughout the economy. It also is expected to generate an estimated \$345 million in federal tax revenue and \$283 million in state and local tax revenues.

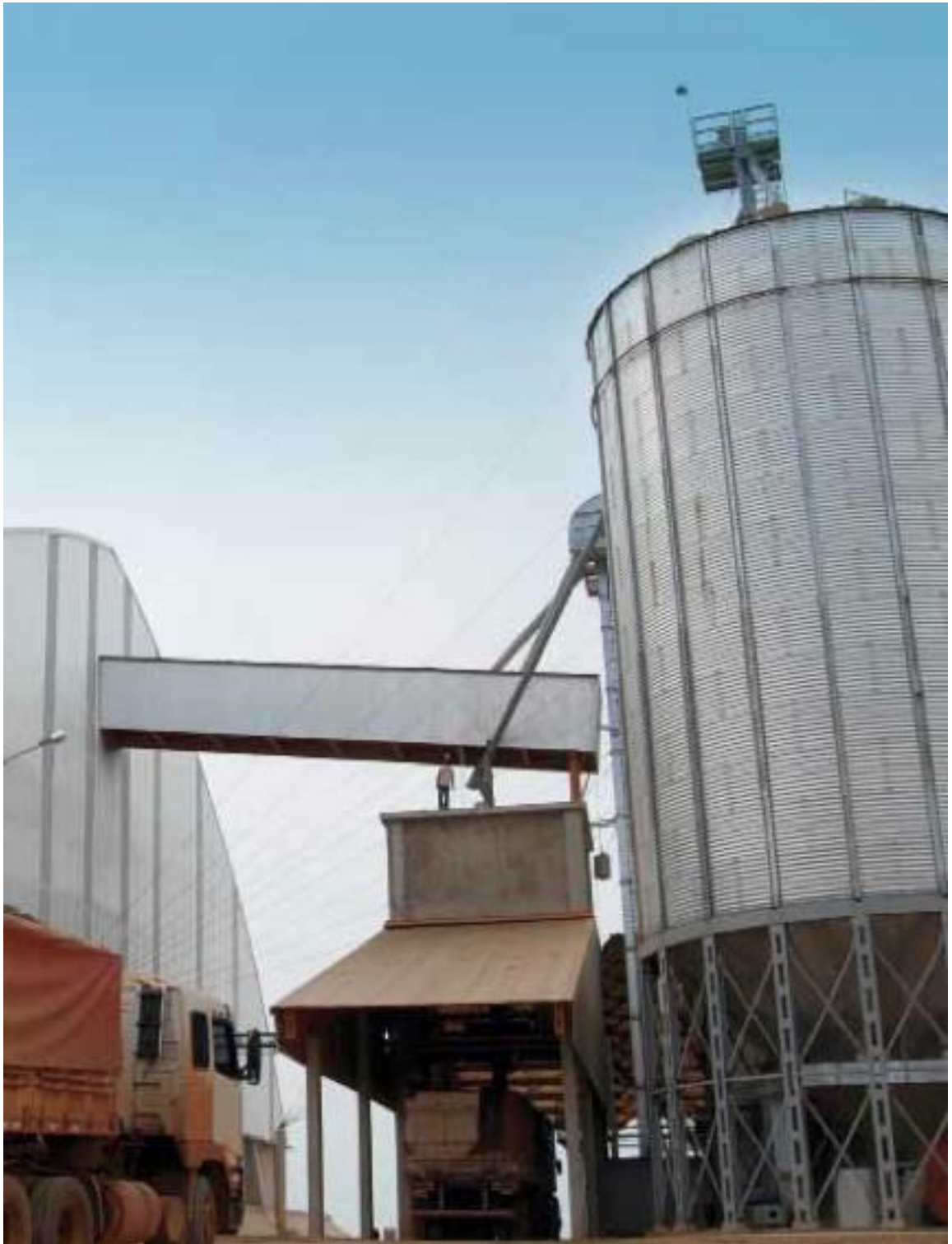
Biodiesel Production Influence on Employment



Biodiesel Diesel Industry Income



Source: National Biodiesel Board Future Projections





## Biodiesel and Bioheat® Quality Assurance Look For...

- B100 – ASTM certification D-6751 (or current version)
- EPA registration, required to sell Biodiesel
- BQ-9000® – Voluntary Quality Assurance Program
- No. 2 Heating Oil – ASTM D-396, (inclusive of up to 5% B100).
- Diesel Fuel – ASTM D-975, (inclusive of up to 5% B100).

Biodiesel controls minor components not found in petro diesel and not addressed by ASTM D-975.

- including stability parameters

Other 'renewable diesel' fuels will need ASTM specifications to control minor components that can cause unexpected filter clogging and system fouling.

### ASTM & Biodiesel

ASTM International is a group that sets technical standards for global industry. D-6751 is their code number for pre-blended Biodiesel fuel.

Biodiesel is the ONLY renewable diesel fuel with approved ASTM specifications:

- ASTM – D-6751: B100 prior to blending
- ASTM – D-975 : On/off road blends up to 5% Biodiesel
- ASTM – D-7467: On/off road blends B6 to B20
- ASTM – D-396: Home heating oil up to 5% Biodiesel (Bioheat®)



## SPECIFICATION FOR BIODIESEL (B100) – ASTM 6751

\*Biodiesel (B100) and the petroleum diesel must meet their respective ASTM specifications before blending.

Property	ASTM Method	Limits	Units
Calcium & Magnesium, combined	EN 14538	5 maximum	ppm (µg/g)
<b>Flash Point (closed cup)</b>	<b>D 93</b>	<b>93 minimum</b>	<b>°C</b>
Alcohol Control (one to be met)			
1. Methanol Content	EN 14110	0.2 maximum	mass %
2. Flash Point	D93	130 minimum	°C
<b>Water &amp; Sediment</b>	<b>D 2709</b>	<b>0.05 maximum</b>	<b>% vol.</b>
Kinematic Viscosity, 40 C	D 445	1.9 – 6.0	mm <sup>2</sup> /sec.
Sulfated Ash	D 874	0.02 maximum	% mass
<b>Sulfur</b>			
<b>S 15 Grade</b>	<b>D 5453</b>	<b>0.0015 max. (15)</b>	<b>% mass (ppm)</b>
<b>S 500 Grade</b>	<b>D 5453</b>	<b>0.05 max. (500)</b>	<b>% mass (ppm)</b>
Copper Strip Corrosion	D 130	No. 3 maximum	
Cetane	D 613	47 minimum	
<b>Cloud Point</b>	<b>D 2500</b>	<b>report</b>	<b>°C</b>
Carbon Residue 100% sample	D 4530*	0.05 maximum	% mass
<b>Acid Number</b>	<b>D 664</b>	<b>0.5 maximum</b>	<b>mg KOH/g</b>
<b>Free Glycerin</b>	<b>D 6584</b>	<b>0.020 maximum</b>	<b>% mass</b>
<b>Total Glycerin</b>	<b>D 6584</b>	<b>0.240 maximum</b>	<b>% mass</b>
Phosphorus Content	D 4951	0.001 maximum	% mass
Distillation	D 1160	360 maximum	°C
Sodium/Potassium, combined	EN 14538	5 maximum	ppm (µg/g)
<b>Oxidation Stability</b>	<b>EN 15751</b>	<b>3 minimum</b>	<b>hours</b>
<b>Cold Soak Filtration</b>	<b>D7501</b>	<b>360 maximum</b>	<b>seconds</b>
For use in temperatures below -12 °C	<b>D7501</b>	<b>200 maximum</b>	<b>seconds</b>

**BOLD = 93-9000 Critical Specification Testing Once Production Process Under Control**

- \* The carbon residue shall be run on the 100% sample.
- # A considerable amount of experience exists in the US with a 20% blend of biodiesel with 80% diesel fuel (B20). Although biodiesel (B100) can be used, blends of over 20% biodiesel with diesel fuel should be evaluated on a case-by-case basis until further experience is available.

## BQ-9000® Advantage

The National Biodiesel Accreditation Program is a cooperative and voluntary program for the accreditation of producers and marketers of Biodiesel fuel called BQ-9000®. The program is a unique combination of the ASTM standard for Biodiesel, ASTM D-6751, and a quality systems program that includes storage, sampling, testing, blending, shipping, distribution, and fuel management practices.

BQ-9000® is open to any Biodiesel manufacturer, marketer or distributor of Biodiesel and Biodiesel blends in the United States and Canada.

### BQ-9000® Goals:

- To promote the commercial success and public acceptance of Biodiesel.
- To help assure that Biodiesel fuel is produced to and maintained at the industry standard, ASTM D-6751.
- To provide a mechanism to track Biodiesel in the distribution system, identifying Biodiesel which meets ASTM standards.

Over 80% of the Biodiesel produced in 2010 was by a BQ-9000® accredited producer. As of 2011:

- 40 BQ-9000® producers
- 23 BQ-9000® marketers
- 3 BQ-9000® lab (Iowa Central)

Many large refiners (i.e. RFS2 obligated parties) are making BQ-9000® a pre-conditioned of purchase. OEM's are requiring BQ-9000® for warranty support.



BQ-9000® helps companies improve their fuel testing and greatly reduce any chance of producing or distributing inadequate fuel.

To receive accreditation, companies must pass a rigorous review and inspection of their quality control processes by an independent auditor. This ensures that quality control is fully implemented.

### **BQ-9000® PRODUCER**

This category is for companies that produce Biodiesel fuel (i.e. the fuel **MUST** meet the ASTM D-6751 standard to be legally defined as Biodiesel). The program ensures a production company is using a system for monitoring the quality of their Biodiesel, including:

- Sampling
- Testing
- Storage
- Retain Samples
- Shipping



### **BQ-9000® MARKETER**

This category is for distribution companies who sell Biodiesel and Biodiesel blends. This is an important designation, because proper handling of Biodiesel is as critical to fuel quality as proper production.



### **BQ-9000® LAB**

This category is for commercial laboratories engaged in the analysis of Biodiesel and Biodiesel blends. Laboratories operated by BQ-9000® Producers and Marketers are also eligible to seek this certification.



## What does Biodiesel have to do with the world's food supply?

Soybeans are grown primarily as high protein meal for livestock.

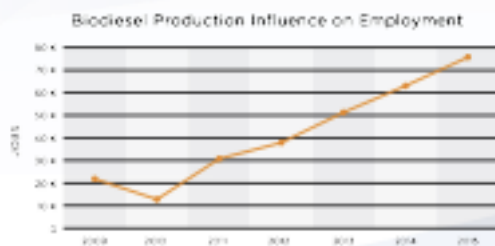
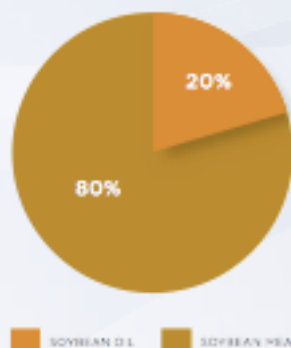
20% of that soy is a by-product, in the form of oil. By increasing the demand and value for soybean oil used in Biodiesel production, the cost of healthy proteins used for feed and foods is significantly reduced.

### Net Positive for Food Supply

All materials used for Biodiesel are by-products. Soybeans are grown based on the demand for their 80% protein meal. By increasing the value of the 20% oil portion, you are lowering the cost of the healthy protein portion used for food and feed. In 2009, the soybeans used to make 247 million gallons of soybean oil based Biodiesel produced soybean meal for 72 billion rations of protein.

### Co-Products of Food Production

Protein meal for livestock feed is the primary driver for soybean production. Better utilization of the oil co-product can reduce the price of the protein meal.



Source: National Biodiesel Board Future Projections



## Biodiesel's GHG Score Expected to Improve

EPA's greenhouse gas emission reduction percentages for Biodiesel use compared to conventional diesel fuel and heating oil:

- Soy greenhouse gas emission reduction: 57% compared to standard petroleum distillate fuel
- Animal fat, used cooking oil, inedible corn oil greenhouse gas emission reduction: 86%

In addition, Biodiesel production continues to get more efficient and existing agricultural land can be used more effectively.

Americans can feel more confident than ever in Biodiesel's ability to meet today's energy needs without sacrificing the ability of future generations to do the same. A new study shows production continues to be astonishingly energy-efficient in making Biodiesel for diesel vehicles and home heating, demonstrating its long-term sustainability.

Newly published research from the University of Idaho and U.S. Department of Agriculture shows that for every unit of fossil energy needed to produce Biodiesel, the return is 5.54 units of renewable energy. This energy-in, energy-out ratio is called "energy balance" or "fossil energy ratio."

### What is Bioheat's\* GGS (Greenhouse Gas Score)?

The EPA's greenhouse emission ratings for Biodiesel are good and getting better. In 1998, the energy balance was 3.2:1 and by 2011, the projected ratio will be 5.54:1.

### Energy Balance

	PROJECTED RATIO
2011	5.54 : 1
2009	4.5 : 1
1998	3.2 : 1

Source: National Biodiesel Board Future Projections



## More Information About Biodiesel

To find more detailed information about Biodiesel go to the National Biodiesel Board website: [www.nbb.org](http://www.nbb.org).



# Bioheat®

## The Evolution of Oilheat

It's an exciting and challenging time to be an Oilheat dealer. You have chosen to take advantage of Bioheat® and help lead your company and the Oilheat industry into the next generation. Bioheat® is a simple choice and a smart solution that results in a better fuel for your customers and ultimately an improvement in your bottom line. The following section will give you important information about Bioheat® and help you become a successful Bioheat® dealer.

### TOPICS COVERED IN THIS SECTION:

- > Bioheat® Definition
- > Bioheat® Advantages
- > Bioheat® in The Marketplace
- > Caring for Your Customers
- > Three Steps to Bioheat® Fuel Management
- > Bioheat® Performance Enhancements
- > Bioheat® and The Environment

## What is Bioheat®?

It's simple. Bioheat® is a blend of Biodiesel balanced with generic home heating oil of high, low, or ultra low sulfur quality.

Bioheat® blends usually range between 2% and 5%. Pure Biodiesel is called B100 and has to meet ASTM D 396 standards for quality. A Bioheat® blend with 2% Biodiesel is referred to as B2, a blend with 5% Biodiesel as B5 and so on up to B100 which is pure Biodiesel. To understand Bioheat®, you must understand Biodiesel.



### Bioheat® Advantages

- No retrofit or equipment modifications
- Enhances and extends equipment life
- Reduces periodic maintenance intervals
- No change in service protocols
- It's ready for distribution now, the future is now!

### Why Bioheat®?

- Growing energy demand
- Consumer transitions to natural gas, propane and wood pellets
- The future of Oilheat is dependent on change
- Bioheat® creates selling opportunity

### Bioheat® in The Marketplace

- U.S. Annual Consumption in 23 States of 7 Billion Gallons.
- Industry Facing Significant Challenges:
  - Housing Market Depressed – Sales & New Construction
  - Conversions to Natural Gas:

### Bioheat® Moving forward – Oilheat Industry Resolution of 2009

- Immediately offer Biodiesel/biofuel blends up to B5 to all customers.
- Implement laws/regulations to mandate the use of ultra low sulfur heating fuel (15ppm).
- Lower carbon intensity of heating oil by training the industry on the installation of thermal solar applications.



### Caring For Bioheat® Customers

In the end, it all comes down to our customers and their acceptance of Bioheat®. Answering their questions and tending properly to their Bioheat® delivery and heating systems is key to customer satisfaction and profitability.



### Common questions customers ask?

"What are the advantages of Bioheat?"

"What modifications will need to be made to my heating system?"

"Is Bioheat® right for my home?"

"How does the price compare to that of traditional heating oil?"

### Bioheat® Performance Enhancements

- Bioheat® B5 — less than 1.0 % lower energy content than N°2 fuel oil.
- B100 = 118,170 BTU/Gallon,  
N°2 Fuel Oil = 135,000 BTU/Gallon  
 $(5\% \times 118,170) + (95\% \times 135,000) / 135,000 = (5908 + 128,250) / 135,000 = 134,158 / 135,000 = 0.99 \%$
- Cetane — 47 Minimum, 50 Average.
- O2 — 11 % higher by weight.
- No Sulfur — Sox (Sulfur Oxides).
- Lower unburned hydrocarbons.
- Cleaner, More Complete and Efficient Burn.

### Bioheat® and The Environment

If the 7 billion gallons of oilheat used per year contained 5% Biodiesel (Bioheat®), approximately 7.7 billion pounds of pollutants would be reduced.

Bioheat® is:

Making Renewable Energy a reality

Reducing Carbon Intensity

Meeting The Low Carbon Fuel Standard

### Three Steps to Successful Bioheat® Fuel Management

#### 1. Check Quality

First, look for BQ-9000® suppliers when ordering Bioheat® and only accept ASTM D-6751 and ASTM D-396 fuel.

#### 2. Maintain As Usual

Using a Bioheat® blend (B5) requires the same maintenance protocols as N°2 diesel fuel. The fuel and air mixtures and pump pressure settings are standard.

#### 3. Know Limitations

You should be aware of Biodiesel's compatibility with engine components. With <B20, simply monitor hoses and gaskets for leaks like you normally would.



## Bioheat® Advantages

Bioheat® has several long term benefits.

It sets Bioheat® marketers apart from other oil companies and energy providers. Rebranding of a 20th Century oil company into an advanced renewable liquid fuel marketer for the 21st Century. Customer loyalty means everything. Remember, today's kids are tomorrows consumers.



### Bioheat® Advantages

- No retrofit or equipment modifications
- Enhances and extends equipment life
- Reduces periodic maintenance intervals
- No change in service protocols
- It's ready for distribution now, the future is now!



### Why Bioheat®?

- Growing energy demand
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- The future of Oilheat is dependent on change
- Bioheat® creates selling opportunity

### The future of Oilheat: Market Drivers for increased Biodiesel gallons and production

- RFS-2 Program kicks off (800 million, 2011, 1.0 billion, 2012, 3.6 billion by 2022)
- The Biodiesel Federal Tax incentive
- State mandates/incentives/use requirements
- Northeast States for Coordinated Air Use Management (NESCAUM) activities (Reduce Carbon Intensity)

### OEM STATUS

#### R.W. Beckett Company

Supports the use of B5, as specified in ASTM D-396. Reference Beckett Technical Bulletin, January 2009 for all alternative fuel recommendations.

#### Riello

Endorses B5 blends and lower percentage blends which meet the requirements of ASTM D-396.

#### Carlin

Factory representatives acknowledge that the company endorses a 5% blend.

#### Suntec

Endorsements of Suntec products for use with Biodiesel fuels are only for fuels blended with Biodiesels meeting ASTM D-6751 and petroleum meeting ASTM D-396. B5 is certified if specifications above are in check.

## Bioheat® in the Marketplace

### Evolution of Heating Oil Industry:

- U.S. Annual Consumption in 23 States of 7 Billion Gallons.

### Heating Oil Industry Profile:

- Bulk of Sales in Northeast and Mid-Atlantic regions of the United States.

### Oilheat Economic Realities Market Share Losses:

- In the 23 NORA States and the District of Columbia, 908,000 fewer homes were using Oilheat in 2007 than in 2000, according to the U.S. Census Bureau.

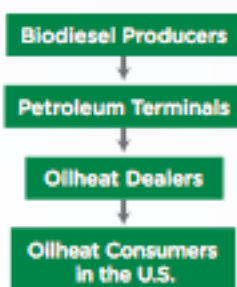
### Industry Facing Significant Challenges:

- Housing Market Depressed — Sales & New Construction

### Conversions to Natural Gas:

- Cleaner Fuel
- Domestic Sources
- Huge Marketing Abilities
- Cost Differential

### Bioheat® Strategic Partnerships:



### OILHEAT INDUSTRY MOVING FORWARD

The industry has made aggressive moves to push efficiency levels over 90%.

New technologies may offer potential for efficiency levels well over 100%. Adopting renewables such as Biodiesel and solar thermal offers potential for strong reductions in petroleum fuel use. Emerging combustion technologies may be developed to offer solutions for very low energy homes.

### Oilheat Industry Resolution of 2009

- Immediately offer Bioheat® Blends from B2 to B5 to all customers.
- Implement laws/regulations to mandate the use of ultra low sulfur heating fuel (15ppm).
- Lower carbon intensity of heating oil by training the industry on the installation of thermal solar applications.

## Caring For Bioheat® Customers

In the end, it all comes down to our customers and their acceptance of Bioheat®. Answering their questions and tending properly to their Bioheat® delivery and heating systems is key to customer satisfaction and profitability. In this section, we address the information required to provide exceptional customer service, secure sales, maintain a Bioheat® system, avoid poor quality fuel and utilize resources that are available to you.

What are common questions customers ask?

### “What are the advantages of Bioheat®?”

Bioheat® is safe and provides a cleaner, more complete and energy efficient burn. Bioheat® may actually extend equipment life and reduce periodic maintenance intervals. Bioheat® is made domestically from agricultural or recycled resources, reducing America's dependence on foreign oil and creating jobs here at home.

### “What modifications will need to be made to my heating system?”

None, when you switch to Bioheat® BS Blend. The performance and properties are the same as your current fuel and maintenance is standard. Most heating system manufacturers — like Beckett, Suntec Industries, and Carlin Combustion — accept Bioheat® and stand by their warranties with its use.

### “Is Bioheat® better than natural gas?”

The switch to Bioheat® is effortless and



studies show that over time, Bioheat® blends may reduce carbon emissions more effectively than natural gas.

### “Is Bioheat® right for my home?”

If you are currently using oil heat, yes. Bioheat® is right for your home and the environment, because it helps reduce sulfur content and improves burner reliability and efficiency.

### “How does the price compare to that of traditional heating oil?”

Pricing is comparable to that of the regular heating oil you are buying now.

## Three Steps to Successful Bioheat® Management

### CHECK QUALITY

First, look for BQ-9000® suppliers when ordering Bioheat® and only accept ASTM D-6751 and ASTM D-396 fuel. Why? Because poor quality fuel may plug filters and strainers, cause injector and nozzle failure, and void Manufacturers' warranties. It could cost you customers and profitability. It's okay to request documentation from the distributor, including the Bill of Lading, Certificate of Analysis, Material Safety Data Sheets, and product labeling placards (API RP 1637 and NCPA-HMIS rating).

### MAINTAIN AS USUAL

Using a Bioheat® blend (B5) requires the same maintenance protocols as heating oil. The fuel and air mixtures and pump pressure settings are standard. Regardless, you should make sure the tanks you're filling aren't contaminated with water, old fuel, or bacterial growth and always use stored fuel within 6 months. Check fuel filters often when Biodiesel is introduced to the system and change them if necessary. Learn about Biodiesel's cold weather properties and take precautions when the temperature drops, just like you would with heating oil.

### KNOW LIMITATIONS

You should be aware of Biodiesel's compatibility with burner components. With <B20, simply monitor hoses and gaskets for leaks like you normally would. But with any blend over B20, fuel system clogging, leakage and false flame failure may occur. B100 is compatible with most oil heating equipment, but may adversely effect natural or nitrile rubbers over time.



## Where Does Bioheat® Fuel Fit?

- Helps mitigate some of the negative attributes of heating oil
- Contributes immediately to help reduce sulfur content, burner reliability and efficiency.
- Offers us a unique position to market an improved product to our consumer base.
  
- Biodiesel and oilheat industries have similar goals and it would benefit both groups to develop a Bioheat® campaign.

## Biodiesel Advantages, B100

- It is renewable.
- It is energy efficient.
- It reduces petroleum-derived heating oil.
- It can be used in most heating oil equipment.
- It can reduce tailpipe emissions, including air toxins.
- It is nontoxic, biodegradable, and suitable

**"Resource Analysis of Energy Use and Greenhouse Gas Emissions From Residential Boilers For Space Heating & Hot Water"**

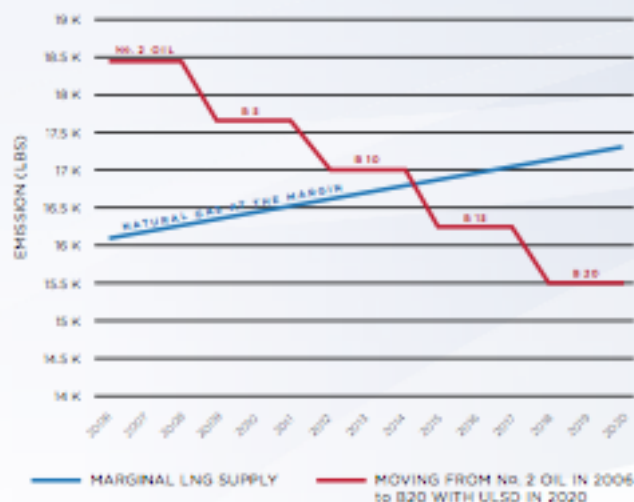
Presented to the Consortium of State Oil Heat Associations GHG Project, ICF International, July 2008.

From an economists perspective, natural gas at the margin, making decision based on small changes in resources.

This analysis compared the relative energy resources consumed and GHG impacts associated with natural gas (pipeline and LNG), heating oil (current product and ultra low sulfur), and biofuels (B5, B20 and B100) used for residential space heating boilers and water heating.

Consideration was given not only to impacts at the point of ultimate energy consumption, i.e., the efficiency of use at the residence, but also to those impacts associated with the production, conversion, transmission and distribution of energy to the household. The potential use of biofuel blends can significantly alter the relative GHG emissions profiles of natural gas and heating oil.

**Annual CO<sub>2</sub> Emissions Comparing High Efficiency Non-condensing Oil Boiler to Natural Gas Condensing Boiler:**  
New York / New Jersey / Pennsylvania



Source: February 2007 : ICF Report entitled, "Final Report Resource Analysis of Energy Use and Greenhouse Gas from Residential Boilers and Hot Water Heaters"

## Making Renewable Energy a Reality

While we're still exploring the capabilities of Bioheat® blends, one thing is certain: we can replace 5% of heating oil used in America right now, with no negative ramifications. In this section, we will reaffirm the environmental benefits of Bioheat® and hopes for future green initiatives.

### What makes Bioheat® good for the environment?

Unlike most fuels, Biodiesel actually has a positive energy balance of 5.54:1. Biodiesel is made from renewable resources like soybeans and biodegrades as quickly as sugar. It promotes better air quality because it produces lower emissions than petroleum diesel. The use of Biodiesels decreases our country's dependence on foreign oil, creates jobs and is good for the U.S. economy.

### Is the oilheat industry reducing its carbon footprint?

If the Oilheat industry is to survive, it must meet the voluntary and mandated demands to reduce sulfur and carbon emissions. Most states in the northeast — the largest oil heating market — along with Oregon and Washington, are in the process of adopting Low Carbon Fuel standards modeled after California's guidelines. The industry's goal in the near future is to primarily sell ULSHD (ultra low sulfur heating diesel) with 2-5% Biodiesel.

### What impact will that have on the environment?

If the 7 billion gallons of oilheat used per year contained 5% Biodiesel (Bioheat®), approximately 7.7 billion pounds of pollutants, including particulate matter, hydrocarbons, oxides of nitrogen, sulfur dioxides, and carbon dioxide would be reduced.

### What does Bioheat® have to do with the world's food supply?

Soybeans are grown primarily as high protein meal for livestock. 20% of that soy is a by-product in the form of oil. By increasing the demand and value for soybean oil used in Biodiesel production, the cost of healthy proteins used for feed and foods is significantly reduced.

### How does using Bioheat® improve domestic energy balance?

Americans can feel more confident than ever in Biodiesel's ability to meet today's energy needs without sacrificing the ability of future generations to do the same. A new study shows production continues to be astonishingly energy-efficient in making Biodiesel for diesel long-term sustainability.

Newly published research from the University of Idaho and U.S. Department of Agriculture shows that for every unit of fossil energy needed to produce Biodiesel, the return is 5.54 units of renewable energy. This energy-in, energy-out ratio is called "energy balance" or "fossil energy ratio".

Still thinking green?  
Find out more about the environmental benefits of Bioheat® in the following pages





## Bioheat® and the Environment

### THE "DRIVERS" OF LOW SULFUR HEATING OIL (LSHO) & LOW CARBON FUEL STANDARD (LCFS)

The LSHO program has its genesis in the Congressional mandate for states/regions to develop plans to restore pristine air quality to National Parks and wilderness areas in the U.S. LCFS initiatives are driven (at this point) by state legislative and executive mandates to reduce GHGs by 10% (or more) below 1990.

### AIR QUALITY, CLIMATE CHANGE AND THE OILHEAT INDUSTRY

Achieving these goals will ultimately require virtual elimination of common man-made pollutants including sulfur

and carbon dioxide. Current efforts should be understood as first phase of more transformational requirements.

### 5% BIODIESEL REPLACEMENT TO ALL HEATING OIL

The Oilheat industry annually distributes approximately 7 billion gallons, if all oil heat included a Biodiesel blend at 5%, = 350,000,000 gallons of Biodiesel blend would be used.

### National Biodiesel Board Emissions Calculator

		Pounds of Reduced Emissions
POLLUTANT	Particulate Matter	2,179,812.49 MM LBS
	Hydrocarbons	2,958,040.80 MM LBS
	Oxides of Nitrogen	4,797,559.77 MM LBS
	Sulfur Dioxide	1,433,250 MM LBS
	Carbon Dioxide	5,235,980,750 B LBS

Source: National Biodiesel Board Future Projections

## NORTHEAST STATES FOR COORDINATED AIR USE MANAGEMENT (NESCAUM).

Low Sulfur heating oil in the Northeast States Emission Benefits of Ultra Low Sulfur Heating Oil and Biodiesel Blends (reduction compared to 2,500ppm sulfur fuel).

### LOOKING FORWARD

NESCAUM values the relationship that has been established with the oilheat industry through the efforts of NEFI and NORA. Acknowledge and applaud the changes your industry has undergone and continues to explore in response to environmental needs. Appreciate oilheat industry's willingness to work with environmental regulators to come up with programs that make sense and hopefully meet our mutual interest.

### Emission Benefits of Ultra Low Sulfur Heating Oil and Biodiesel Blends

POLLUTANT	Reduction with 500ppm Sulfur Heating Oil	Reduction with 500ppm Sulfur Heating Oil / Biodiesel Blend (80/20)
SO <sub>2</sub>	75%	84%
PM	60%	> 60% <sup>1</sup>
NO <sub>x</sub>	10%	20%
Hg	—	20% <sup>2</sup>
CO <sub>2</sub>	1-2%	17-18%

Source: December 2005 : Northeast States for Coordinated Air Use Management (NESCAUM) Low Sulfur heating oil in the Northeast States.

## Bioheat® Resources

*Where can dealers turn when they need help?*

If you would like to speak with a fuel advisor personally, or need analytical or troubleshooting support, the Bioheat® Resource Center is here to help. Just call **877.B51.LINE** for assistance.

Online, there are also vast resources of information. Go to [www.biodiesel.org](http://www.biodiesel.org) and [www.bioheatonline.com](http://www.bioheatonline.com) to access the technical library, view educational videos, read the Biodiesel bulletin, or browse through databases and spec sheets.

*Want to know more about Bioheat® service?*

Help yourself to more details on the following pages:



[www.nbb.org](http://www.nbb.org)



[www.bq9000.com](http://www.bq9000.com)



[www.nora-oilheat.org](http://www.nora-oilheat.org)

## Bioheat® Sales & Marketing Strategy

As a Bioheat® dealer, you also become a Bioheat® marketer, making sales and championing the benefits of renewable energy. This section discusses how you can position your business accordingly, gives some consumer insights that will help you close the sale and provides advertising and marketing tools for your use.

### TOPICS COVERED IN THIS SECTION:

- > Capitalize on being a Bioheat® Marketer
- > Deliver messages that resonate with customers
- > Make a personal connection
- > Educate your customers
- > Tell the Bioheat® Story
- > Use the Bioheat® Marketing Workbook



## Bioheat® Sales and Marketing Benefits

Bioheat® transforms traditional oilheat into a modern, renewable home heating fuel for the next generation.

- Renewable and Sustainable
- Creates American Jobs
- Reduces the Use of Foreign Oil
- Helps Clean the Air
- No Need to Change or Modify Existing Equipment
- Bioheat® Costs are Similar to Traditional Oilheat



### Consumer Profiles

Three focus groups conducted in New York, Boston, and Philadelphia showed us that customers using oilheat have a favorable perception of Bioheat®.

- Consumers trust oilheat dealers' service departments as energy advisors.
- Consumers respond more readily to the renewable nature of Bioheat®.
- Consumers respond to Bioheat® as an American job creator.
- All consumers respond very positively to Bioheat®'s reducing dependence on foreign oil.
- No consumer wants to expend cost or energy to adopt a new fuel, the fact that Bioheat® requires no change in equipment is a big advantage.

### Bioheat® Consumer Education Talking Points

Let your consumers know the whole Bioheat® story from the field to burner with these quick and easy talking points.

- Bioheat® is a blend of Biodiesel and traditional heating oil.
- Biodiesel is made from American grown feedstocks like soybeans.
- Biodiesel is made from the byproduct of existing farming and food processing — Biodiesel does not effect the food supply.
- Standard blends of Bioheat® range between 2% to 5%.
- Over 7 billion gallons of oilheat are currently used to heat homes in the U.S.
- Bioheat® costs are similar to traditional oilheat.



## Capitalize on being a Bioheat® marketer

Eroding margins and market share is eating at profitability. Bioheat® offers an opportunity to distinguish your business and build for the future with these key Bioheat® benefits:

- No Need to Change/Modify Existing Equipment
- Renewable and Sustainable
- Creates American Jobs
- Reduces the Use of Foreign Oil
- Helps Clean the Air

### Positively influence the perception of your company

The adoption of Bioheat® indicates leadership and that your business is progressive and unique. It also shows that you truly care about the environment and the people in your service community. Bioheat® adds a newsworthy spin on the business that can generate publicity and lead to a broader customer base.





## Deliver messages that resonate with your customers.

Three focus groups conducted in New York, Boston, and Philadelphia showed us that customers using oilheat have a favorable perception of it and that they trust dealers' service departments as energy advisors. We found that some consumers like the idea of renewable energy primarily because it reduces dependence on foreign oil, addresses the price volatility of crude oil and is made in America. Others prefer renewable energy because it's the cleaner solution that improves air quality and because they like being part of the "green" solution.

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*Participants were screened in Waltham, Massachusetts, Langhorne, Pennsylvania and New York City, New York to meet the following criteria:*

- AGE 25 OR OLDER
  - HOMEOWNERS
  - RESPONSIBLE FOR PAYING THE HOME HEATING BILL
  - USE OILHEAT TO HEAT THEIR HOME
  - CROSS SECTION OF GENDER, INCOME AND EDUCATION LEVELS.
- 

### Perceptions of Oilheat

The focus group was unanimous in their choice and use of Oilheat. Oilheat is favorable with their customers:

- Safety, efficiency, reliability and personal service
- Pricing options
- Industry competition
- Trusting service technician
  - Energy advisor
- Consultant in home renovation and building projects

### Bioheat®: Awareness & Perceptions

Most participants were generally unaware of Biodiesel and Bioheat® highlights:

- Made in America
- Reducing our nation's dependence on foreign oil is a major benefit
- Renewable, sustainable, cleaner, better health effects are appealing
- Participants might be willing to pay a little more for Bioheat®
- Improved air quality benefits
- America should pursue Biodiesel and Bioheat®

### Consumer Perceptions & Benefits of their Full Service Oilheat Provider

The full service dealer targets 2 hours response for on call emergency service call. Flexible pricing program options. Vested in the community.

- Little league sponsorships
- Civic organizations
- They know who you are
- How many families house keys are in your office?

### Customer Demographic

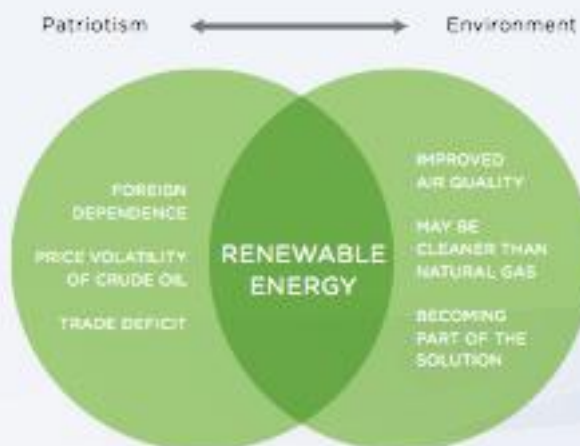
Crosses Political Lines  
Young vs. Old  
Male vs. Female

### Keys to Marketing Bioheat<sup>®</sup> to the Consumer

- No Equipment Modifications
- Made in America
- Creates American Jobs
- Reduces our Dependence on Foreign Oil
- Improves the Air We Breathe
- Is Priced Similar to Today's Oilheat
- Is a Better Home Heating Oil

### Bioheat<sup>®</sup> Sales Funnel

- Bioheat<sup>®</sup> is a better home heating oil
- Bioheat<sup>®</sup> is a natural solvent
- Bioheat<sup>®</sup> provides natural lubricity



## Make a personal connection and promote positive word-of-mouth advertising.

You have an advantage over competing home heat energy providers — you deliver your product directly to your customer's home and service their equipment when needed. This gives you a great opportunity to speak to your customers in person instead of just dropping off a brochure. Your customers think of you as a trusted provider of one of the most basic necessities in their lives. Bioheat® can take that personal relationship a step further and strengthen the loyalty of your customers. Strengthen this personal connection and don't be afraid to ask them to let their friends and neighbors know about Bioheat® — word-of-mouth advertising works wonders.



### Here are some key steps to take to get word-of-mouth off the ground:

- Identify a way in which your product is remarkable. It's easy, that's where Bioheat® comes in.
- Think about who your advocates can be and the influencers for your business and brand. Can you identify some key customers who can spread the word?
- Invite your key customers to participate in the program. You may want to reward them for it, this can range from just providing t-shirts, to giving cost discounts for referrals.
- Combine your word-of-mouth with other advertising both online and in print.
- Provide a call-to-action — a place to go or how to take action. At the very least, drive the conversation to your website or to [www.bioheatonline.com](http://www.bioheatonline.com).

Word-of-mouth is often the number one way a company has achieved knowledge about a product and is often in the top three. It's a key factor for getting your name out there and a driver for marketing success.

### Who or What Do You Trust?

Recommendations from consumers	78%
Newspapers	63%
Consumer opinions posted online	61%
Brand websites	60%
Television	56%
Magazines	56%
Radio	54%
Brand sponsorships	49%
Email I signed up for	49%
Ads before movies	38%
Search engine ads	34%
Online banner ads	26%
Text ads on mobile phones	18%

Source: Nielsen Online Global Consumer Study, April 2007



## Educate your customers — they are more likely to buy in.

Let your consumers know the whole Bioheat® story from the field to burner with these responses to frequently asked questions.

### "What are the advantages of Bioheat®?"

Bioheat® is safe and provides a cleaner, more complete and energy efficient burn. It is a renewable energy source; it is also non-toxic, biodegradable and suitable for sensitive environments. Bioheat® may actually extend equipment life and reduce periodic maintenance intervals. Bioheat® is made domestically from agricultural or recycled resources, reducing America's dependence on foreign oil and creates jobs here at home.

### "What modifications will need to be made to my heating system?"

None, when you switch to Bioheat® B5 Blend. The performance and properties are the same as your current fuel and maintenance is standard. Most heating system manufacturers — like Beckett, Suntec Industries, and Carlin Combustion — accept Bioheat® and stand by their warranties with its use.

### "Is Bioheat® better than natural gas?"

The switch to Bioheat® is effortless and studies show that over time, Bioheat® Blends may reduce carbon emissions more effectively than natural gas.

### "Is Bioheat® right for my home?"

If you are currently using oilheat, yes. Bioheat® is right for your home and the environment, because it helps reduce sulfur content, burner reliability and efficiency.

### "How does the price compare to that of traditional heating oil?"

Pricing is comparable to that of the regular heating oil you are buying now.



## Tell the Bioheat® Story

Contact your local newspapers, radio, cable, and television stations to let them know about Bioheat® availability. Fill them in on the basics so they understand that you have a publicity worthy story to share.



### USE ONLINE MEDIA

The world needs to know that you are now a renewable energy provider. It's more important than ever to maintain a company website with email addresses where the media and potential customers can contact you to learn about your services and the Bioheat® product. In addition, your site should be linked to the Bioheat® website via our dealer locator feature. Social media tools like Facebook and Twitter are also valuable resources for promoting your business. It's easier than ever to establish a presence online and in today's world, it's essential.



### COLLABORATE WITH OTHERS

Are there any "green" organizations in your community that might welcome a talk on Bioheat®? Do your local schools or scouting clubs seek information about renewable energy? Are there awards given in your community for innovative or environmentally aware businesses? Perhaps there are home shows or Earth Day festivals in the works. Get involved! Engage in activities in your marketplace that synergize with the renewable energy effort and you will reap the rewards.




#### CLOSE THE SALE WITH THESE HELPFUL TIPS

If your customers hesitate about the switch, try to pinpoint why they wouldn't use Bioheat®. There are no valid reasons to resist using Bioheat® and since it is the better choice all around, you should be able to close the sale. Don't forget to remind them that it feels good to do the right thing...for their heating system, home, our country, and the environment.

- Why wouldn't they use Bioheat®?
- There's a better choice, with no effort needed!
- It feels good to do the right thing helping reduce the use of foreign oil.
- They can maintain their sense of independence they love!
- They're helping produce American jobs.



#### KNOW THE REQUIREMENTS FOR USING THE BIOHEAT® TRADEMARK

The National Biodiesel Board (NBB) and the National Oilheat Research Alliance (NORA), owns the trademark rights to the term "Bioheat." The blended fuel used in association with the term must contain a minimum of 2% Biodiesel by volume, with the conventional high or low-sulfur oil meeting ASTM D-396 standards and the pure Biodiesel meeting ASTM D-6751 standards. As a registered trademark, a  should always follow the name.



*Get ready for action...*

*Use this helpful guide to develop a plan to adopt and market Bioheat®.*

## **Bioheat® Marketing Plan Workbook:**

Developing a marketing plan will help you take the most advantage of Bioheat®.

The following pages will guide you through some of the key steps and considerations.

Follow these basic steps and you'll be well on your way to finding success with Bioheat®.

- Assess your current situation
- Identify your market segments and targets
- Define a strategic marketing mix
- Create a value proposition and product positioning
- Develop a launch plan
- Train your sales and service department team
- Establish your budget
- Define your metrics of success
- Evaluate and re-assess your situation and adjust if needed

## STEP 1:

# Assess Your Current Situation

A great way to evaluate your situation is to perform a SWOT analysis. SWOT stands for strengths, weaknesses, opportunities, and threats. The goal of SWOT is to determine where the company's products, services, or product lines fit within the context of the internal and the external environments. Evaluate your situation with Bioheat® as a part of your offering and see how you stack up against the marketplace. You may find some opportunities with other areas of your business that can help support your efforts with Bioheat®.

### STRENGTHS

*what you are really good at*

### OPPORTUNITIES

*how to leverage your strengths*

### WEAKNESSES

*where you are falling short*

### THREATS

*your vulnerabilities due to your weaknesses or competitor strengths*

Strengths	Weaknesses
Opportunities	Threats

Fill in your own SWOT analysis here

By harnessing this data, you'll have a way to validate and guide your marketing investments. From this exercise, you can also derive some key marketing objectives which will guide your entire effort. Adding Bioheat® to your offering can give you the product differentiation you need to make your business stand apart from the competition.

Your initial objective for offering Bioheat® may simply be to generate awareness and increase loyalty for your business through the adoption of Bioheat®. This may help customers from switching to other dealers or from switching to other sources of home heat.

## STEP 2:

# Identifying Market Segments and Target Customers

Market segments represent groups of customer types who have similar needs. Segments help you tailor a specific marketing mix or message to satisfy the needs of a group of customers (a segment).

For instance: You may have commercial customers with needs far different from your residential customers. Differentiating these needs will guide a particular strategy for the commercial segment.

Customer targets are sub-groups within each segment. For instance, among your residential customers you may find differences between the wants and desires of suburban customers and urban customers based on their demographics. The more finely focused your efforts, that is, on your target markets, the more focused and effective your marketing efforts can be.

These simple questions will help establish your segments and define your targets:

### Segment/Target 1

1. Geographic Location \_\_\_\_\_
2. Age \_\_\_\_\_
3. Economic Status \_\_\_\_\_
4. Marital Status \_\_\_\_\_
5. Size of Family \_\_\_\_\_
6. Length of Residence \_\_\_\_\_
7. History with Oilheat \_\_\_\_\_

### Segment/Target 2

1. Geographic Location \_\_\_\_\_

2. Age \_\_\_\_\_

3. Economic Status \_\_\_\_\_

4. Marital Status \_\_\_\_\_

5. Size of Family \_\_\_\_\_

6. Length of Residence \_\_\_\_\_

7. History with Oilheat \_\_\_\_\_

### Segment/Target 3

1. Geographic Location \_\_\_\_\_

2. Age \_\_\_\_\_

3. Economic Status \_\_\_\_\_

4. Marital Status \_\_\_\_\_

5. Size of Family \_\_\_\_\_

6. Length of Residence \_\_\_\_\_

7. History with Oilheat \_\_\_\_\_



### STEP 3:

## Strategic Marketing Mix

Once the market segments and the market targets are determined, actionable elements of the marketing plan can be uncovered. The Strategic Marketing Mix is used to describe the framework for actual marketing plans and programs for your company. To describe the marketing mix, one expression has become predominant — the 4Ps, which include:

**PRODUCT:** A complete description of the product, its attributes and how its benefits and value are positioned in the marketplace.

**PRICE:** A translation of the value or willingness of a customer to pay for the product.

**PROMOTION:** How customers are informed about the product or how businesses communicate benefits, value, pricing actions or product attributes.

**PLACE (distribution channels):** The manner in which businesses deliver products to customers.

The marketing plan should contain a description of all of the elements of the marketing mix. Imagine that each P is a lever in a 'marketing machine.' As the product moves through the market, the product team and/or marketing managers will be making adjustments to those 'levers' of the marketing mix. The goal for this section of the marketing plan is to define each of the elements of the marketing mix and how those elements will come together in a cohesive plan. The following sample grid matches up the Strategic Mix against possible targets for Bioheat®. This is only a suggestion, you should evaluate your own situation to create a final plan.

### STRATEGIC MARKETING MIX

	Target 1	Target 2	Target 3	Target 4
Product				
Price				
Promotion				
Place				

### STRATEGIC MARKETING MIX

	Target 1	Target 2	Target 3	Target 4
Product				
Price				
Promotion				
Place				

#### STEP 4:

## Create a Bioheat® Value Proposition & Product Positioning Statement

The Value Proposition is used to define and prove the economic or strategic benefit of the product or service for a given target market. It must be expressed in the customer's terms. The proof should be expressed clearly. You've heard some of the Value Proposition for Bioheat® in previous pages. Here's a recap. You may wish to add more Value statements more specific to what your company offers.

#### Bioheat® Value Proposition:

- Renewable and Sustainable
- Creates American Jobs
- Reduces the Use of Foreign Oil
- Helps Clean the Air
- No Need to Change or Modify Existing Equipment
- Little to No Extra Cost

The *Product Positioning Statement* is a tool to describe how you wish your company and your product to be perceived by your target audience. Here's an example of an introductory positioning statement that includes Bioheat®:

*(Your Dealership) is now powered by Bioheat®, the renewable home heat for oilheat users that helps clean the air, creates American jobs and requires no change or modification to existing equipment.*

You should alter this statement to make it more specific to your business. To prepare your positioning statement you need:

1. The name of the product
2. The target market
3. An understanding of the needs of that market and how those needs are to be satisfied with your product or service
4. How your product or service is better than that of the competition.

Practice Positioning Statement

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Practice Positioning Statement

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Practice Positioning Statement

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Final Positioning Statement

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## STEP 5:

# The Bioheat® Launch Plan Activation

The product launch is an intense series of activities and tasks that actually begins prior to your customer marketing efforts. The product launch is really just a set of dates and deliverables that show how efforts can and should be coordinated between team members. Use this grid as a starting point for developing action items for each team member.

### Product Launch Deliverables:

	Start Date	End Date	Responsible Person or Organization	Dependency on other functions or needed information	Risks
Marketing Collateral/ Promotions Events PR					
Customer Service Call Center Set Up Staffing Training					
Finance Metrics Systems					
Sales Training Staffing					
Product Development Product Testing Quality					

## STEP 6:

# Train Your Bioheat® Sales Team

Your sales and service team should have all the Bioheat® information and training you can provide so they're prepared to qualify customers and represent the value and benefits of Bioheat®. The Bioheat® Activation Guide you're reading now is a great resource to share with your entire team. This section is devoted to outlining the work needed to help the sales force to sell. The information should be communicated as simply as possible.

1. Market segments and targets
2. Selling Strategy — Provide a paragraph or some bullets that help the sales teams
3. Bioheat® education and overview
4. Describe the Bioheat® product and service in detail
5. Ways to qualify customer needs/desires
6. Identify key influencers and decision makers
7. List price and possible discounts
8. Communication of Bioheat® value proposition
9. Positioning for the product against the competition
10. Customer references
11. Resources for more information

## STEP 7:

# Identify Tactics That Meet Your Strategic Objectives

Determining which tactics to employ in your marketing plan can be the biggest challenge for any business. There is no one-size-fits-all answer to this question and it's a process that continually evolves over time. It's critical to identify your objective (remember Step 1) and establish a strategy from the Strategic Marketing Mix (Step 3) before you start picking your tactics. Some tactics work better than others to reach your objectives.

For instance, if your goal is to generate awareness, you may wish to budget most of your money towards getting the most impression in front of the most people. A combination of Outdoor advertising combined with Radio is a great mix for maximizing exposure and awareness. You may wish to increase loyalty, in which case you'll be putting most of your effort towards your current customers and a combination of reward promotion delivered via direct mail both in print and online may deliver the best results.

### Here's a list of common tactics you might use in your marketing mix over time:

- Public relations
- Print advertising in local newspapers and magazines
- Outdoor advertising on billboards, buses, shelters and subway cars and stations
- Radio advertising either as stand-alone spots or sponsorships of shows
- Local television sponsorships
- Digital online ads in local business or media websites
- Social media/digital viral communication
- Direct mail advertising from purchased lists in your market
- Direct mail advertising to your current customers
- Advertorials in local magazines
- Newspaper wrap advertising
- Statement stuffers
- Door hangers
- Street-level marketing (handout flyers on the street)
- Local event sponsorships
- Event marketing
- Cross promotions with other marketing partners with overlapping target markets

There are many more tactics to employ, be creative and committed to your results and measure effectiveness. The last thing you want to do is spend time, effort and money unwisely.

### Sample Tactical Mix for Bioheat® Marketing

**Objective:** Introduce and build awareness of Bioheat® to current customers

**Strategy:** Maximize dealer brand and Bioheat® brand impressions to customers



#### Outdoor Advertising

(Location for drive time for customers)

- Billboards
- Bus Shelters
- Subway signs



#### Public Relations

(Maximize Environmental message)

- Local newspaper articles
- Local T.V. News

#### Dealer Brand



#### Radio Advertising

(Pick the right station/shows for target)

- News, sports, music



#### Direct Mail

(Targeted list)

- Statement stuffer
- Email blast










**STEP 8:**

## Bioheat® Budgeting

No marketing plan is complete without a budget. The budgets established for the Bioheat® marketing plan should be prepared within the context of the financial targets of your operation. Furthermore, the financial plan establishes some of the metrics against which actual performance will be evaluated as the plan is executed.

Based on the sample marketing tactics outlined on page 65, here's a look at a sample budget for those tactics. The numbers will change for your particular situation and objective of course.

	Tactic	Creative	Media/Printing
	Outdoor	\$500	\$3,000
	P.R.	\$1,500	\$200
	Radio	\$300	\$2,000
	Email blast	\$200	\$300
	Bill Stuffer	\$300	\$500
	SUB TOTAL	\$2,800	\$6,000
	<b>TOTAL</b>		<b>\$8,800</b>

Based on your Strategic Marketing Mix, start by laying in costs for the tactics you plan to employ. Start broad, then make decisions and evaluate elements on a case-by-case depending on the state of the business, affordability, etc. Provide as much detail as you can. Indicate any assumptions that you can to support each item.

### Budget Grid for Bioheat® Marketing

	Q1	Q2	Q3	Q4	Total
Print (trade periodicals, etc.)					
Direct Mail (letter shop/postage/printing)					
Email (list rental, email tools)					
Premiums (spell out details for each)					
Events (provide details)					
Ad Agency Fees/Creatives (define each program)					
Promotional Discounts					
Sales Training					
Radio/TV					
Travel					
Staffing					
<b>TOTALS</b>					

### Budget Grid for Bioheat® Marketing (your categories)

	Q1	Q2	Q3	Q4	Total
<b>Total</b>					

## STEP 9:

### Measurements (or metrics)

Every dimension of the marketing plan requires an investment. Whether it's carrying out a research project or investing in a big advertisement. All activities are planned to drive business. Therefore, measurements need to be put into place to determine whether the investment yielded the intended results. Typical measurements might consider:

- Did the marketing program generate the number of sales leads desired?
- Were the number of sales leads sufficient to create proposals which led to new business?
- Did the advertisement generate more visits to the website?
- Did the campaign generate higher levels of customer satisfaction?

It is up to the person, team, or organization to determine which metrics to use, the frequency with which they are evaluated and the follow up on action plans which clarify or redirect the business in deriving new marketing initiatives.

Sit down with your team and determine the metrics most important to your organization and evaluate them on an ongoing basis.



## Bioheat® Technical & Service Considerations

Bioheat® will be a healthy addition to your operation and isn't complicated or difficult to maintain or service. Essentially, Bioheat® should be treated with the same care and technical skill required for handling traditional heating oil. There are technical and service aspects of Bioheat® like material contamination factors and cold flow properties that should be considered and they're outlined in this section.

### TOPICS COVERED IN THIS SECTION:

- > Bioheat® Fuel Properties
- > Bioheat® Contamination Factors
- > Managing Bioheat® in Cold Temperatures
- > Material Compatibility
- > Ultra Low Sulfur
- > Three Steps to Bioheat® Fuel Management
- > Bioheat® Service Checklist
- > Technical Studies
- > Bioheat® Technical Resources



## Fuel Properties

For optimum burner performance, viscosity is important because it affects the nozzle flow, which controls the input of heat to the appliance. The viscosity of Biodiesel complies with industry standards unless long-term oxidation occurs.

### The Fuel

- Biodiesel is a diesel-like fuel
- Biodiesel is completely miscible with diesel or home heating oil ASTM D-396

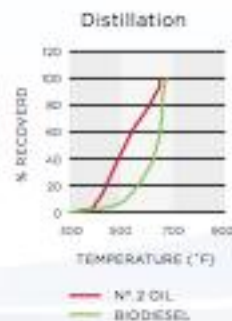
Some Differences from heating oil include:

- Oxygenated by -10% by weight
- 8-10% higher density
- Very low sulfur and nitrogen content

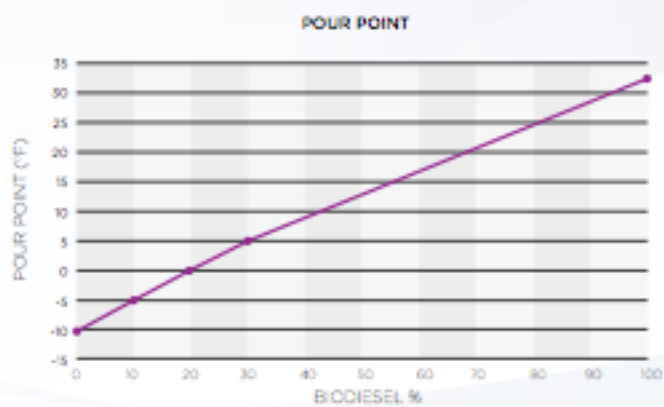
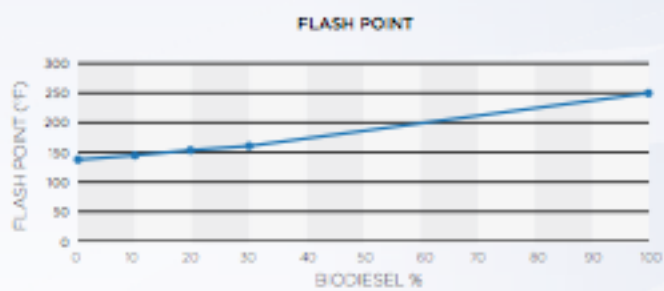
### Storage Stability

The ASTM specification for Biodiesel now includes a minimum stability specification. Fuels meeting this requirement are expected to be free from stability problems for at least a one year storage period.

- Biostab — major European study on stability
- 15-month storage test — no strong change observed in quality parameters
- Oxidation does occur slowly, antioxidant additives (preservatives) have been shown to be effective
- Housekeeping — water control importance



Source: Brookhaven National Laboratories



Source: Brookhaven National Laboratories

## Contamination Factors

Air, water, and dirt.

Air enters through vent pipes and brings in large amounts of moisture and increases oxidation of the fuel. Poorly constructed or deteriorating vents and seals may also allow water to infiltrate storage tanks. Moisture accelerates corrosion and fuel degradation, so extended storage requires the use of stabilizers. If stabilizers aren't used, the stored fuel degrades and forms sediment. Sediment can cause plugged filters, fouled injectors, and fuel system corrosion. Contaminants such as dirt and sand may also be introduced with fuel delivery. A general lack of housekeeping can increase the chance of operational headaches as well.



FILTER  
PLUGGING



MOISTURE



TANK SEDIMENT



NOZZLES



SLUDGE



AIR

### Sediment and Biodiesel

- Most tanks have water and sediment on bottom.
- Product of years of biological and oxidative degradation.
- What is solvency impact of Biodiesel blends?

Some users have reported that Biodiesel can loosen pre-existing tank sludge leading to requirements for filter changes. Lab tests done at BNL have not confirmed this effect.

## Managing Fuels in Cold Temperatures

Pay attention to the feedstock used in Biodiesel production, because it makes a marked difference in cold weather performance. For instance, canola oil's cold flow factor is at 26°F, which makes it more applicable in cold conditions than tallow, with a cold flow factor of 60°F.

### CLOUD POINT

Temperature at which the paraffin wax falls out of the liquid phase.

### CFPP

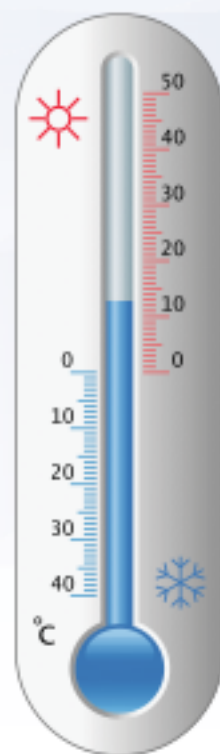
The absolute lowest operating temperature a vehicle will operate.

### POUR POINT

Temperature which fuel ceases to flow, more a storage flow temperature used by pipelines and terminals.

### FEEDSTOCK COLD FLOW FACTORS

- Soy Methyl Ester +38°F / 3°C
- Canola 26°F / -3°C
- Tallow +60°F / 15°C
- Yellow Grease +46°F / 7°C



## Material Compatibility

Lab studies have shown that long term exposure to brass, bronze, lead, tin, and zinc can accelerate Biodiesel degradation. There is, however, a great deal of field experience in which systems using these metals operate without service problems with Biodiesel blends.

### Elastomers

- Mechanical Property Evaluation
  - Swelling
  - Tensile strength
  - Elongation
  - Modulus of elasticity
  - Hardness
- A systematic study of the specific nitrile material commonly used in legacy oil burners is now in progress. This will supplement other studies on nitrile material.

A study by Underwriters Laboratories (UL) was conducted of the compatibility of B5 Biodiesel blends with elastomer seals commonly found in heating systems now. The materials passed these tests.

Compatibility with nitrile generally at blend levels up to B20 has been reported by National Renewable Energy Laboratory (NREL). Tests with the specific nitrile seals used for many years in oil burner pumps are on-going. For higher blend levels conversion to different seal materials, such as viton is recommended.

To learn more go to <http://www.clean-diesel.org/>

### Fuel Pumps

Seal materials are currently nitrile for higher blends. Using higher blends may require a change to Viton.

### Combustion Chamber

Combustion chamber refractory tests passed. Detailed side-by-side tests to evaluate impacts on cast iron boiler sealants showed no impact.

### POOR QUALITY FUEL LEADS TO:

- Filter & Strainer Plugging
- Injector & Nozzle Failures
- Warranty Concerns
- Lost Customer Confidence
- Unscheduled Service Calls, Reduced Profits





## Ultra Low Sulfur

Reports of corrosion on fuel handling and distribution equipment with the recent use of ULSD were reviewed by the Clean Diesel Fuel Alliance. Their initial report indicated that Biodiesel was potentially a contributing cause to the corrosion, even though not all the ULSD tested contained Biodiesel.

**> In a follow-up report, the comment about Biodiesel was rescinded.**

### WHY ULTRA LOW SULFUR HEATING OIL / BIODIESEL BLEND?

- Clean
- Deposit reduction, heat exchanger efficiency improvements, green
- Reduced acid emissions, reduced particulate emissions, more sustainable fuel



Nº. 2 HEATING FUEL  
0.04% SULFUR BY WEIGHT



Nº. 2 HEATING FUEL  
0.18% SULFUR BY WEIGHT



Nº. 2 HEATING FUEL  
0.34% SULFUR BY WEIGHT



Nº. 2 HEATING FUEL  
1.08% SULFUR BY WEIGHT

## Studies

There is still a lot of work being done to further substantiate the use of Biodiesel.

Oil burner pump testing and tests for legacy pump seal compatibility with Biodiesel content are being conducted to determine limitations. Documentation is being gathered from field experiences with Biodiesel blends and issues that arise in the field are being responded to rapidly. Facts are still being investigated to establish results on the success of ULSD with B20. A review of available combustion data is being studied and documentation regarding the impact of Biodiesel on copper components is in progress.

Beyond the current studies, we plan on conducting tests on the operability of Biodiesel at low temperatures and its storage stability. Biodiesel fuels that are not soy-based need to be validated. There is also a need to explore the conversion of tanks from heating oil to Biodiesel blends. The emissions resulting from Biodiesel blended with ULSD need to be confirmed, as well as Biodiesel's impact on older (versus newer) yellow metals.

### 2011 HEATING OIL TECHNICAL PROJECTS—BTSC

- Limits on Biodiesel content based on oil burner pump testing
- Limits on Biodiesel content based on oil burner legacy pump seal compatibility
- Rapid response to field issues
- Documentation of field experience with Biodiesel blends
- Review of available combustion data
- Documentation of Biodiesel impact on copper components.

### 2012 PROPOSED HEATING OIL TECHNICAL PROJECTS

- Low temperature operability
- Storage stability
- Validation of fuels other than soy-based Biodiesel
- Conversion of tanks from heating oil to Biodiesel blends
- Confirm emissions with Biodiesel blended

### BTSC STRATEGIES

- Limits on Biodiesel content based on oil burner pump testing.
- Rapid response to field issues.
- Limits on Biodiesel content based on oil burner legacy pump seal compatibility.
- Documentation of field experience with Biodiesel blends.

### \$5 ASTM EFFORT PARTICIPANTS

#### SPONSORS

National Biodiesel Board:  
Paul Nazzaro  
Steve Howell

National Oilheat Research Alliance:  
John Huber

#### MAIN PERFORMER

Underwriters Laboratories Inc.:  
Travis Hardin  
Thomas Blewitt  
Thomas Thompson

#### SUPPORTING ORGANIZATIONS

R.W. Beckett Corp.:  
Vic Turk

Carlin Combustion Technologies:  
Thomas Tubman  
Chuck Feldman

Biello Burners:  
Alan Simpson

Suntec:

Brockhaven National Laboratory:  
Tom Butcher  
C.R. Krishna  
Yusuf Celebi  
George Wei  
Chris Brown

## Prior Studies Are Encouraging

NREL/TP-540-38834, 2005 — Elastomer Compatibility Testing of Renewable Diesel Fuels included several Nitrile seal materials; "The results indicate that all of these elastomers appear to be fully compatible with 20% Biodiesel blends". Our elastomers are different — we need to document compatibility for these specific materials.

## North American Lab Emissions Studies

- RW Beckett Co.
- Brookhaven National Laboratory
- CANMET Energy Technology Center (Ottawa)
- New England Fuel Institute/NORA
- Imperial Oil



### FIELD SURVEY

- Objective - capture and technically document field experience with blends higher than B5
- Three stages: rough survey to identify scope of experience and high potential partners; detailed survey of selected partners including service records; sampling

### INITIAL RESULTS

- Level of Biodiesel use: how long, how many customers, blend level
- Exploration of higher blends?
- General opinion about Biodiesel
- Service records
- Willingness to participate

### KEY CONCLUSIONS:

- Lab tests in boilers & furnaces with No. 2 oil
- Combustion stability is good to B100
- NOx emissions are somewhat lower
- Particulate emissions are lower, in proportion to fuel sulfur content
- Flame luminosity somewhat lower at higher blend ratios, particularly during startup transients

### FIELD STUDIES: ABBOTT & MILLS

- in cooperation with Brookhaven, NYSERDA sponsored
- 2001-2005, Upstate New York
- B20, 100 homes
- Furnaces, boilers, water heaters
- indoor, outdoor, buried tanks
- Winter design temperature 0°F
- No increase in service resulting from Biodiesel use

### FIELD STUDIES: WARWICK

- 2001-2002 in two phases
- 32,285 gallons blend burned
- NOx emissions reduced by 10%
- No combustion performance impacts
- Fuel storage temperatures to 50°F

### FIELD STUDIES: SAGAMORE HILL

- in cooperation with Brookhaven, National Park Service, and NYSERDA sponsored
- Theodore Roosevelt home and museum
- B20, 2 years
- No problems in appliances or storage
- B100 tests done, pump seals changed to viton

## Three Steps to Bioheat® Fuel Management Success.

### CHECK QUALITY

First, look for BQ-9000® suppliers when ordering Bioheat® and only accept ASTM D-6751 and ASTM D-396 fuel. Why? Because poor quality fuel may plug filters and strainers, cause injector and nozzle failure, and void Manufacturers' warranties. It could cost you customers and profitability. Request documentation from your distributor, including the Bill of Lading, Certificate of Analysis, Material Safety Data Sheets, and product labeling placards (API RP 1637 and NCPA-HMIS rating).



### MAINTAIN AS USUAL

Using a Bioheat® blend (B5) requires the same maintenance protocols as #2 diesel fuel. The fuel and air mixtures and pump pressure settings are standard. Regardless, you should make sure the tanks you're filling aren't contaminated with water, old fuel, or bacterial growth and always use stored fuel within 6 months. Check fuel filters often when Biodiesel is introduced to the system and change them if necessary. Learn about Biodiesel's cold weather properties and take precautions when the temperature drops, just like you would with No. 2 petro diesel.

### KNOW LIMITATIONS

You should be aware of Biodiesel's compatibility with engine components. With <math>B20</math>, simply monitor hoses and gaskets for leaks like you normally would. But with any blend over B20, fuel system clogging, leakage and false flame failure may occur. B100 is compatible with most elastomers used after 1993, but may adversely effect natural or nitrile rubbers over time.



#### BIOHEAT® DIAGNOSTIC >20%

- Fuel system clogging may occur.
- Fuel system leakage – seal deterioration, oxidizing metals and yellow metal fittings.
- Flame Sensor – false flame failure with blends over B20 may occur.
- Standard fuel and air mixture setting.
- Standard pump pressure setting.

#### OEMS POSITIONS ON BIODIESEL

##### Engine Warranties:

- Parts and workmanship
- OEM's don't make fuel
- OEM's Don't warrantee fuel
- As with diesel – problems caused by the fuel is the responsibility of the fuel supplier
- Heating oil OEM's align with these thoughts
- [www.biodiesel.org/resources/fuelfactsheets/standards\\_and\\_warranties.shtml](http://www.biodiesel.org/resources/fuelfactsheets/standards_and_warranties.shtml)

#### MAINTAINING A BIOHEAT® SYSTEM

- The same standard maintenance procedures utilized for heating oil should be used for a Bioheat® blend.
- Bioheat® (B5) Blend – yields the same performance standard as N° 2 Fuel Oil.
- Check for water in fuel supply, remove when possible.
- Simply follow the same protocols.

#### BIOHEAT® PRECAUTIONS & OEM'S

- With Bioheat®, B5 Blend there are no precautions, the fuel performance and properties will be equal to that of N° 2 fuel.
- Standard OEM Procedures are required, Beckett, Suntec & Carlin with noted positions with Bioheat®.
  - Beckett is pleased to announce we will warranty our burners for use with Bioheat® blends, up to B5, meeting the fuels standards below.
  - Suntec Industries Incorporated, "B5" Biodiesel Fuels, 5% ASTM D-6751 Biodiesel and 95% ASTM D-396 fuel oil blends, are the current focus of Biodiesel marketing efforts in the fuel oil heating industry. Based on tests with these fuels, Suntec endorsed on May 16, 2006 all model A/B units already in the field for use with B5 Biodiesel fuels. Similarly, on May 15, 2007, all other Suntec products were endorsed for B5 Biodiesel fuels.
  - Carlin Combustion, No written statement as of August 2006, phone communication with representative stated that they did not have a problem with B5. (Communication B-6-08, with AFS).

#### BIODIESEL USAGE CHECKLIST

- Only accept ASTM D-6751 Biodiesel and ASTM D-396 fuel and periodically take fuel samples
- Look for BQ-9000® suppliers
- Avoid storage tanks contaminated with water or old fuel; bacterial growth
- Check fuel filters on vehicles and delivery system frequently upon initial Biodiesel use and change them as necessary
- Be aware of Biodiesel's cold weather properties and take precautions as with N° 2 petro diesel use in cold weather.
- Be aware of Biodiesel's compatibility with engine components.
- Use stored Biodiesel (B100) within six months

#### DOCUMENTATION

- BOL – Bill of Lading
- COA – Certificate of Analysis
- Material Safety Data Sheets
- Product Labeling – Place cards
  - API RP 1637
  - NPCA – HMIS Rating



## Bioheat® Technical Resources

- Technical Library
- Biodiesel Bulletin
- Educational Videos Available
- Informational Resources
- Technical Resources
- On-line Database & Spec Sheets
- [www.biodiesel.org](http://www.biodiesel.org) or [www.bioheatonline.com](http://www.bioheatonline.com)
- Bioheat® Resource Center: 1-877-B51-Line

## Bioheat® Resource Center

- Coordinated effort to address fuel problems efficiently and economically.
- Provides troubleshooting and analytical support.
- Provides personal counsel when you need it most.



## Bioheat® Resource Center

*Where can dealers turn when they need help?*

If you would like to speak with a fuel advisor personally, or need analytical or troubleshooting support, the Bioheat® Resource Center is here to help. Just call **877.B51.LINE** for assistance.

Online, there are also vast resources of information. Go to [www.Biodiesel.org](http://www.Biodiesel.org) and [www.bioheatonline.com](http://www.bioheatonline.com) to access the technical library, view educational videos, read the Biodiesel bulletin, or browse through databases and spec sheets.