



# New Fuels for Oilheat

## Toward a Sustainable Energy Future

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# Why New Fuels?



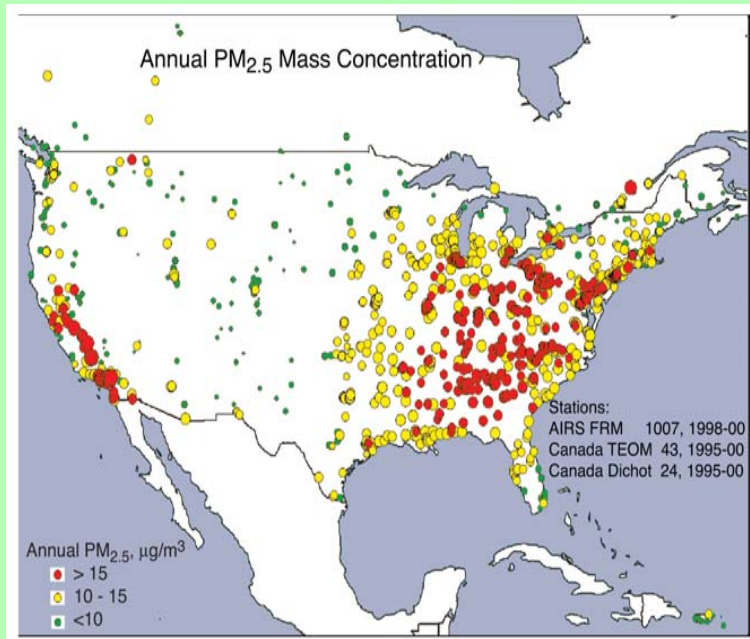
Energy Independence

# Why New Fuels?

## Smog



# Why New Fuels?



## Particulate Emissions (PM 2.5)

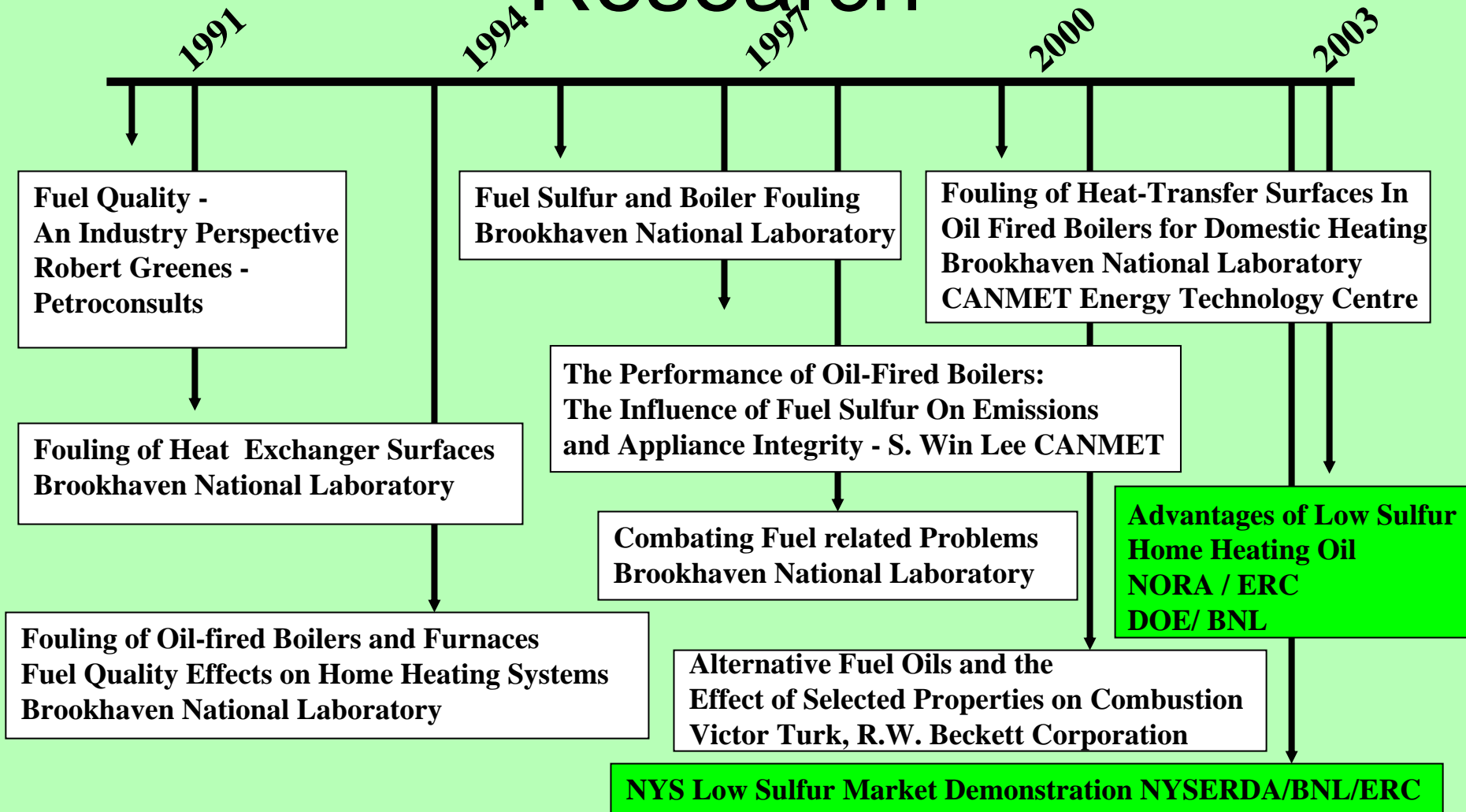


# Why New Fuels?

## Global Warming



# Low Sulfur Heating Oil Research



# Sulfur and Nitrogen Content in Fuels

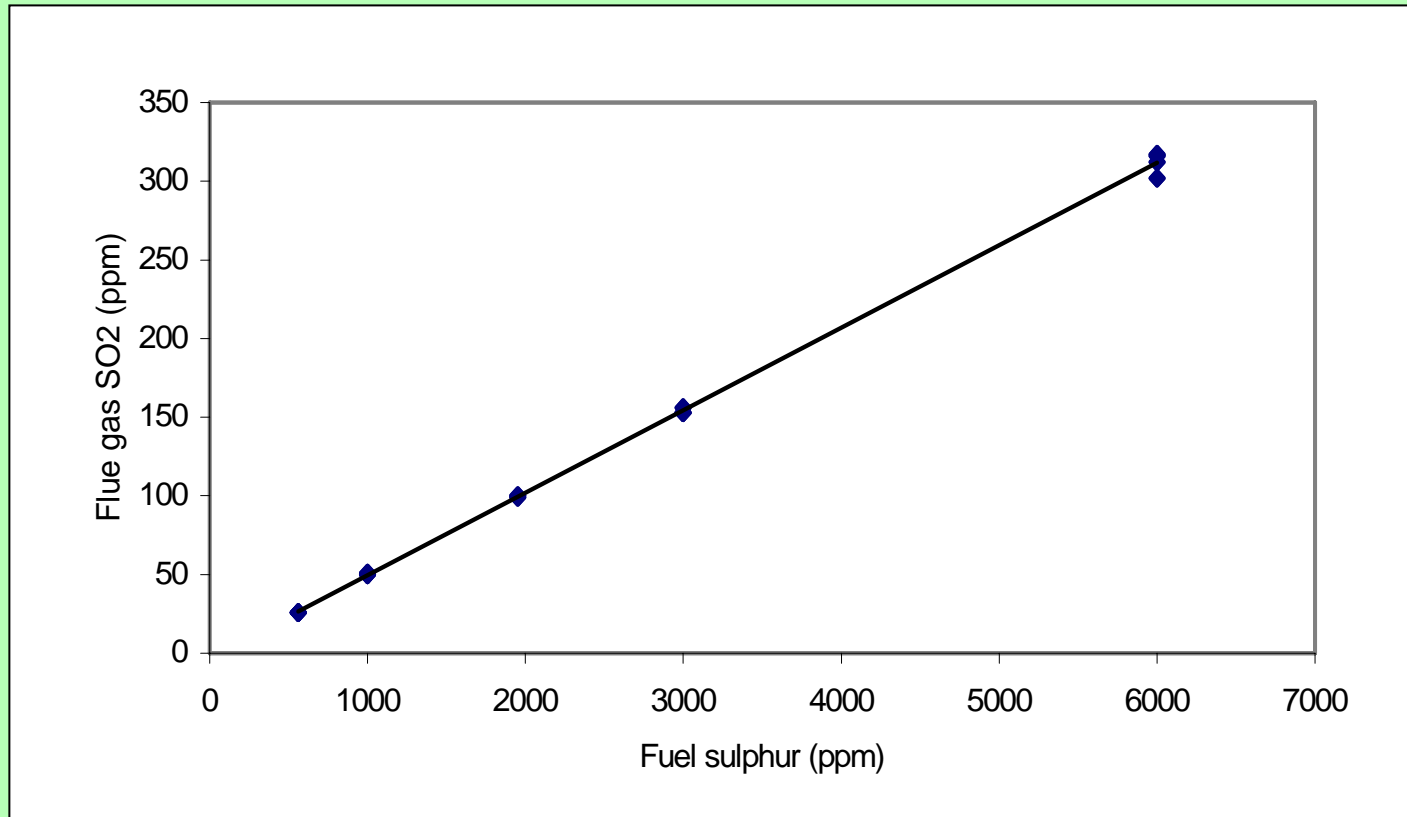


	S	N
No. 2 Heating Oil	2000 ppm	<900 ppm
Low Sulfur Diesel	350 ppm	150 ppm
ULS Diesel	<15 ppm	<100 ppm

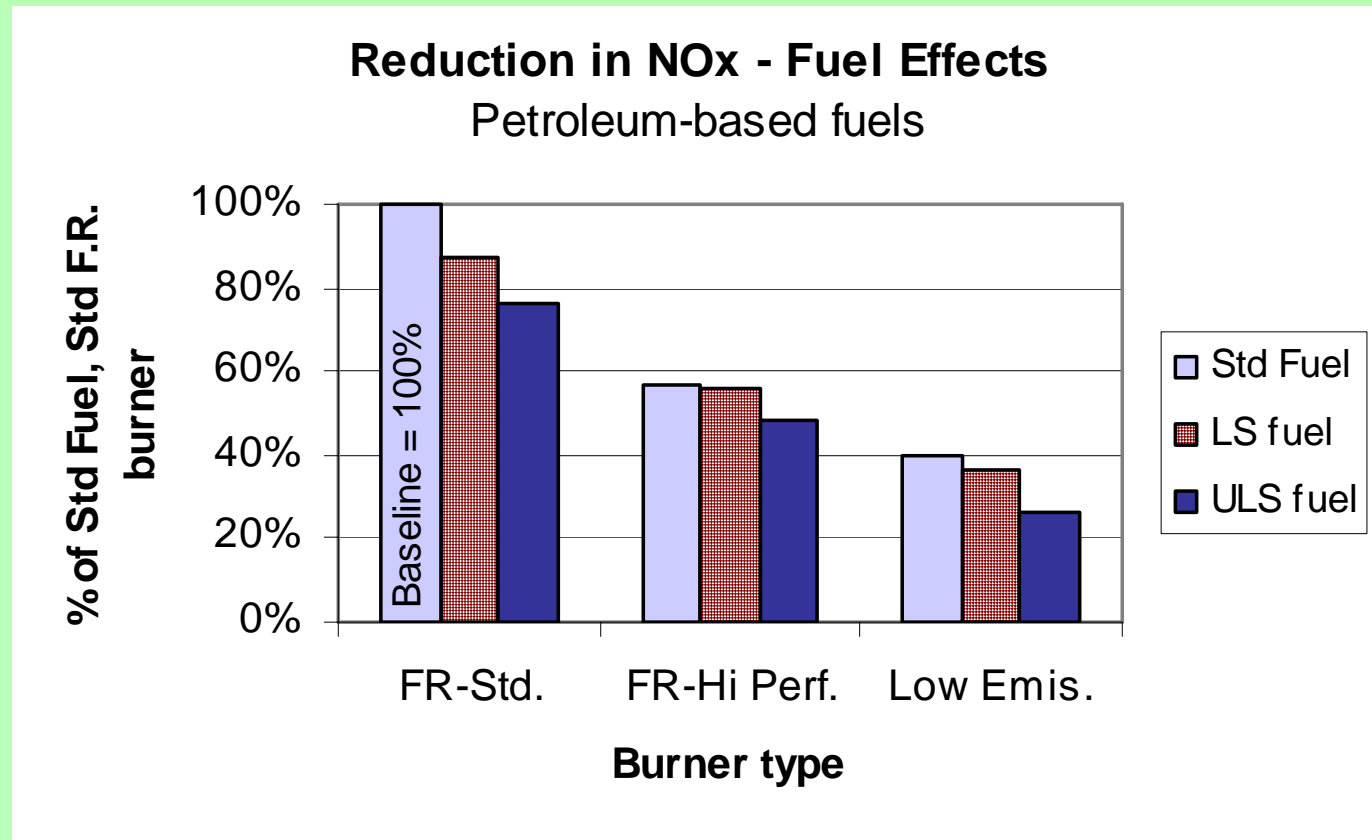
# BNL Laboratory Testing



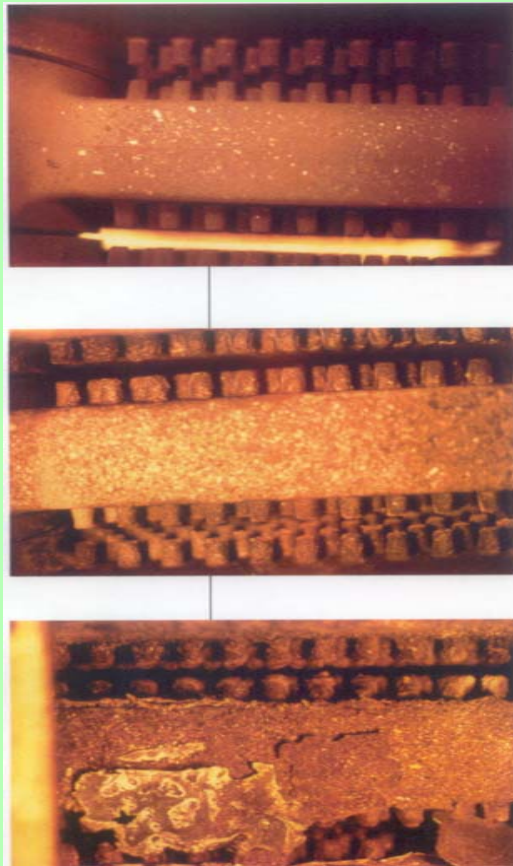
# Effect of Fuel Sulfur on Flue Gas SO<sub>2</sub> Emissions



# Fuel Sulfur Effects on NO<sub>x</sub> Formation



# What Does Low Sulfur Mean In The Real World of Boilers?

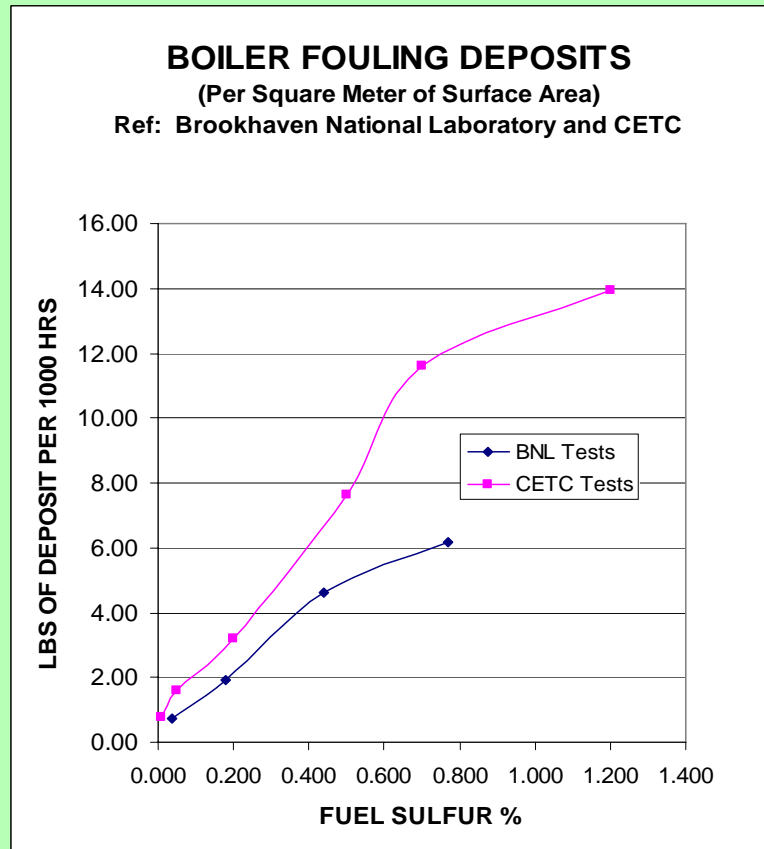


**No. 2 heating fuel  
0.04% sulfur by weight**

**No. 2 heating fuel  
0.18% sulfur by weight**

**No. 2 heating fuel  
1.08% sulfur by weight**

# Low Sulfur Achieves Cleaner Heat Exchangers



# Low Sulfur Fuel Demonstration

1000 Homes

Buhrmaster Energy Group

Albany, New York



# Low Sulfur Fuel Demonstration

Buhrmaster Energy Group


Albany, New York





# Low Sulfur Heating Oil Field Demonstration in 1000 Homes


**BOILER FOULING COMPARISON SCALE**  
Visual Determination from #1 through #5  
Customer /ID: \_\_\_\_\_ Date: \_\_\_\_\_


C  
h  
e  
c  
k  
  
O  
n  
e  
  
B  
o  
x  
  
O  
n  
l  
y

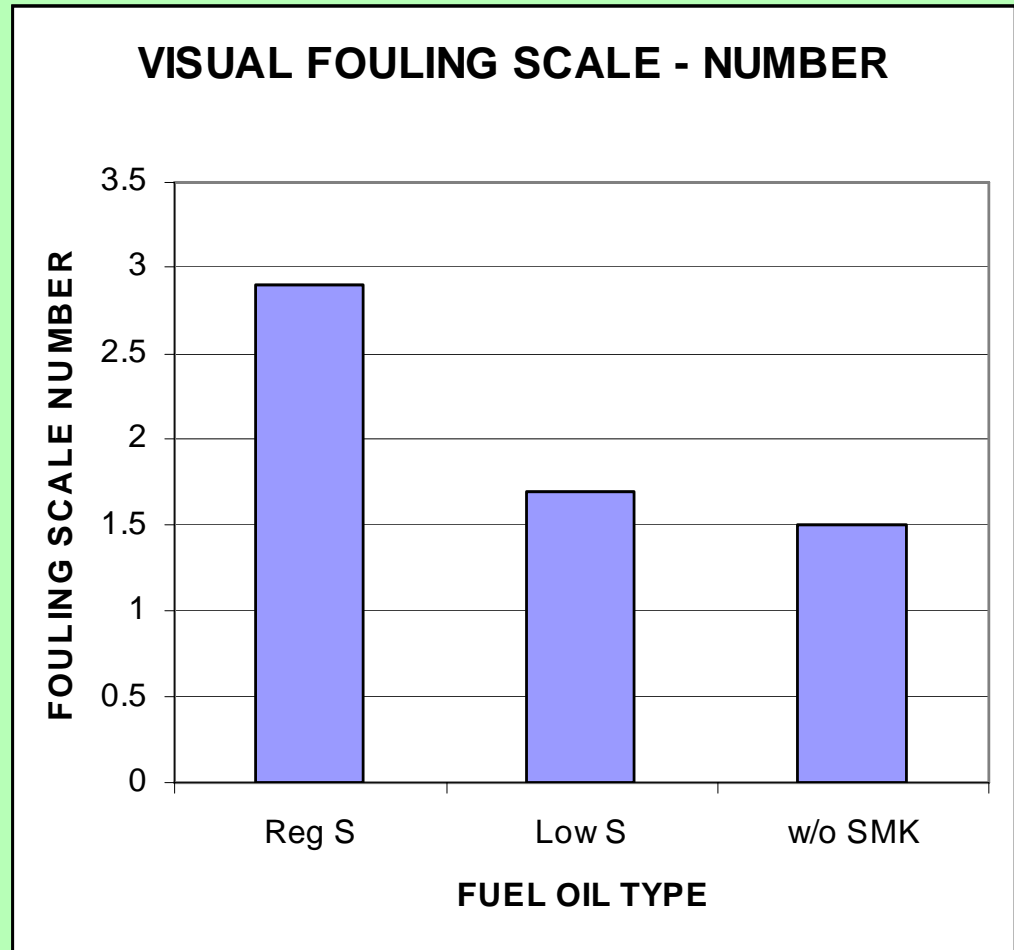
#1 Level 

#2 Level 

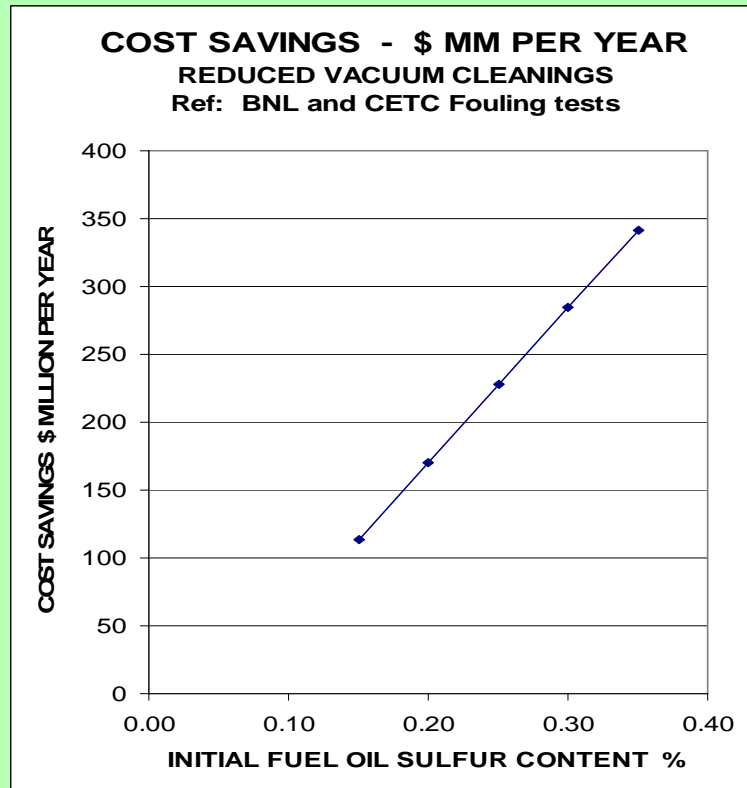
#3 Level 

#4 Level 

#5 Level [ More than #4 ] 



# Low Sulfur Heating Oil Maintenance Cost Saving Estimates



# Low Sulfur Benefits and Advantages

## Summary

Service and cleaning cost savings for fuel oil dealer

Energy Savings for Customer – 1 to 2 percent or more annual savings

Opportunity for condensing heating systems

Improved market image and more effective competition with natural gas

# Leading Oilheat Dealers in the United States Starting to Use Low Sulfur Fuel Oil



Don Allen  
E.T. Lawson, Inc.  
Virginia

Chairman of NORA

Why not low sulfur heating oil in New York State?

The sales tax problem!

# WHY YOU SHOULD CONVERT TO LOW SULFUR (0.05%) HEATING OIL

## **The potential benefits accrue to:**

- **Your Oilheat company**
- **Your service department**
- **Your business image**
- **The fuel industry across the USA**
- **Everyone's environment**

## **If you resell and deliver No. 2 distillate product**

to end use consumers, you should know that conversion to low sulfur heating oil (0.05% product by weight) has the potential for significant improvement of your operating results, especially if your company services and maintains No. 2 oil-fired heating equipment.

You have likely read about low sulfur heating oil product in the trade press, encountered discussions at a business meeting, or know of fuel dealers who presently deliver on-highway diesel product that is dyed red for end user consumption as heating oil. (For example, in some Midwest cities, the 0.05 transportation fuel is a norm for both on-road and heating applications.)

It is important for Oilheat marketers to recognize why use of this product may be beneficial to all concerned.

Here is the situation: while present day heating oil is not very high in sulfur content (most product does not exceed 0.20% sulfur), actual field results from dealers who deliver the low sulfur product prove that it performs much better.

In numerical terms, the difference between 0.20 and 0.05 may not seem like much, but the 0.05 product has "75% less sulfur," which results in lower emissions, and simply burns a lot cleaner.

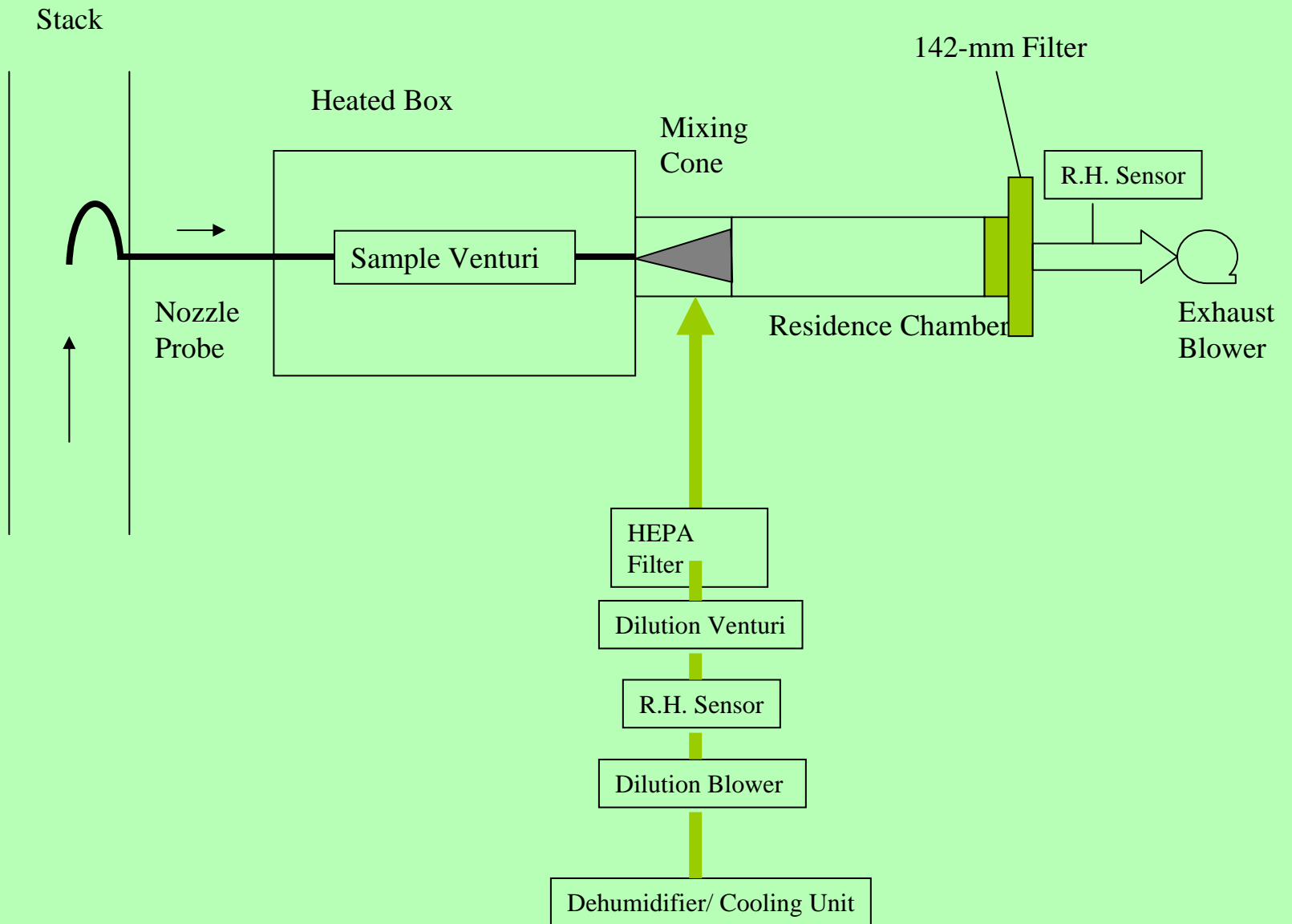
# Fine Particulate Emissions (PM 2.5) Testing



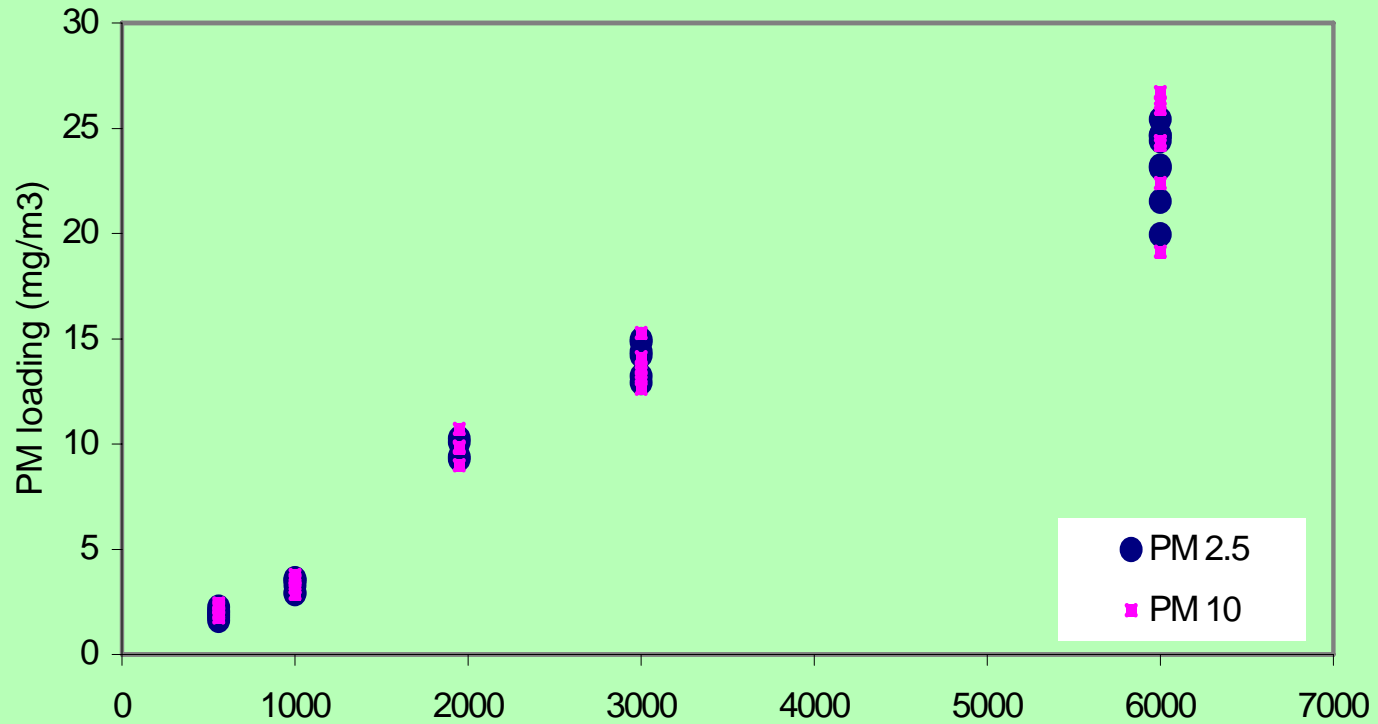
## **Dilution Sampler for Fine Particulates**

## **EPA Conditional Test Method (CTM-39)**

- fuel sulfur levels from 15 to 2000 ppm
- alternative fuels (biodiesel)
- advanced burners (blue flame)
- condensing boilers



# Effect of Fuel Sulfur on PM<sub>2.5</sub> and PM<sub>10</sub> Emissions



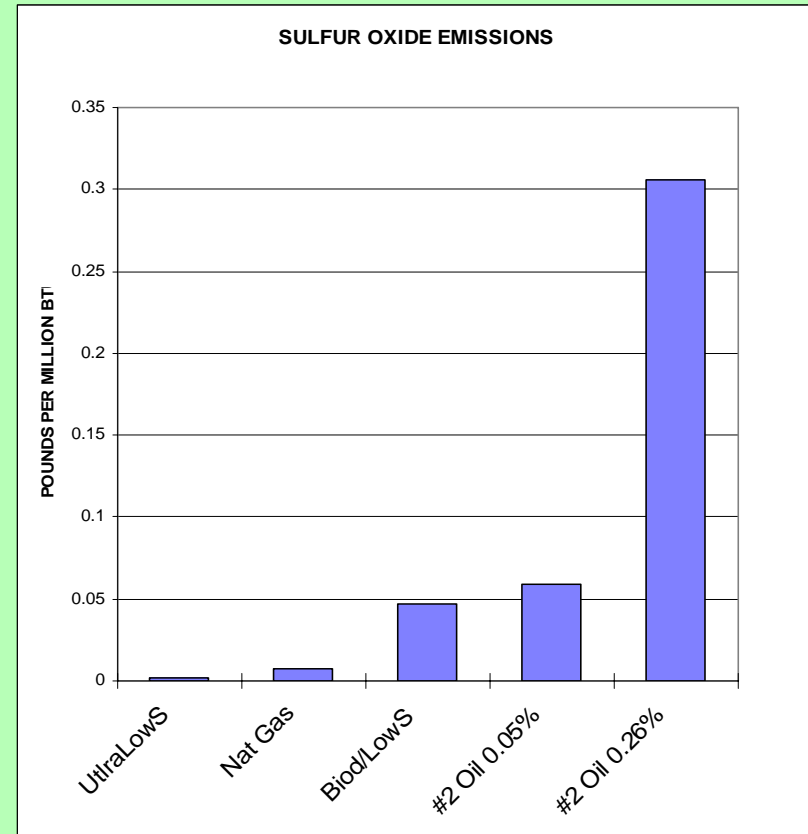
90+ percent of PM 2.5 emissions are sulfate-based

# Ultra-low Sulfur Fuel Oil

Further improvement in market image for oilheat

Makes oilheat the winner over natural gas in sulfur oxide emissions

Phased introduction can reduce refinery capacity problems



Ref: USEPA Publication AP-42

# What is biodiesel?

Biodiesel is a renewable fuel, derived from natural oils, such as soybean oil, which meets the specifications of ASTM D 6751.

Biodiesel is not raw vegetable oil.

Biodiesel contains about 10 - 12 % oxygen in chemical structure.

Biodiesel has ultra-low sulfur and nitrogen contents.

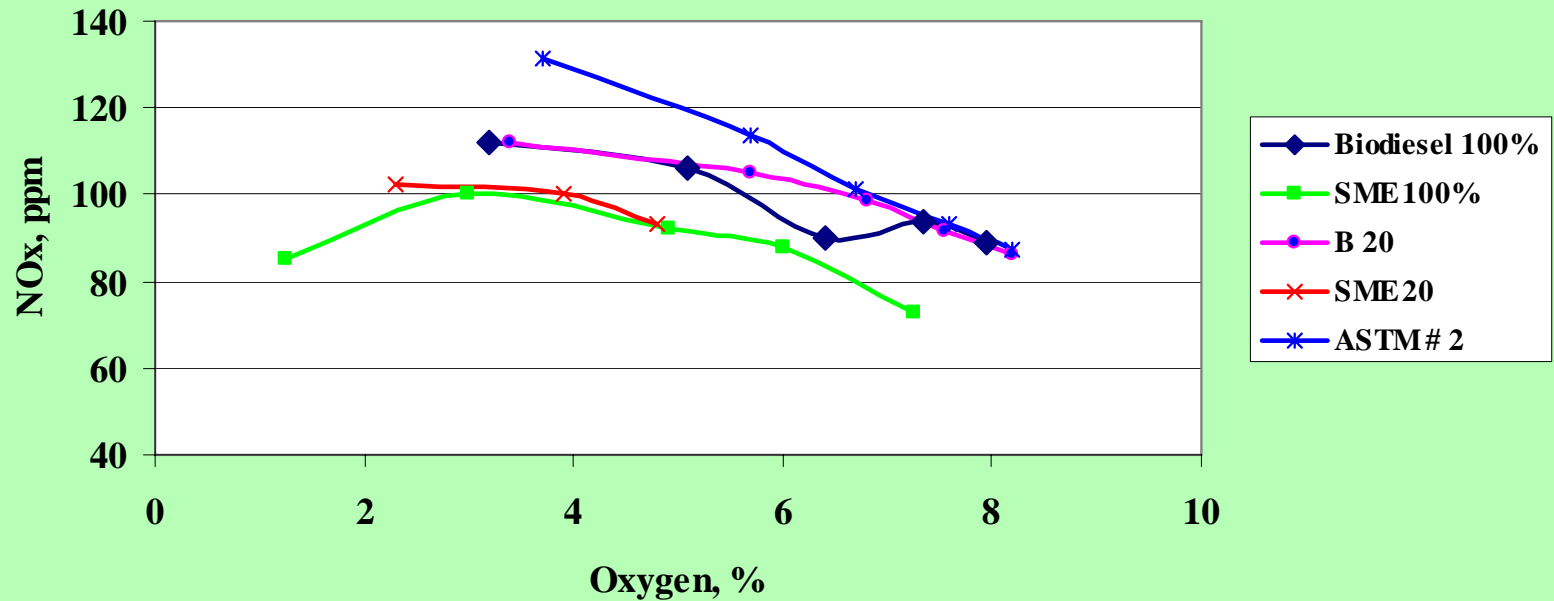
Biodiesel can be blended with petroleum-based heating oil and used with little or no equipment modification.



# Biodiesel Lab Testing - NOx

## Residential Boilers

NOx from biofuels compared



## Biodiesel Lab Testing - Conclusions



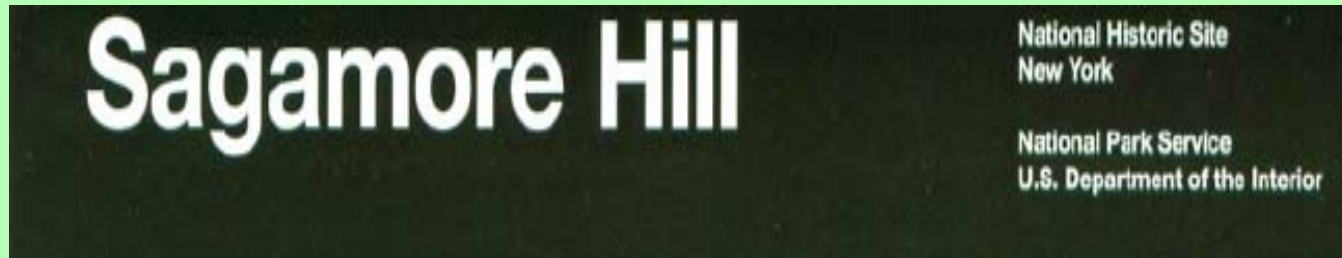
- **Biodiesel blends of up to B20 can be used without equipment changes**
- **Lower NOx emissions were measured**

# Biodiesel Field Testing

- Abbott and Mills, Inc. in Newburgh, NY
- Funded by NYSERDA/NORA/USDOE-NRBP
- Four seasons of supplying B20 to about 100 homes
- About 300,000 gallons B20 delivered
- No fuel related problems in storage, blending, delivery and use



# Field Testing of B20 and B100





Delivering comfort to The Bronx, Manhattan  
and Westchester.

*Family run since 1904.*



BE SMART. BE SURE.  
SCHILDWACHTER





Sclafani Petroleum

Putnam County, NY



# Educational Resources

## NBB (800) 841-5849



### Ask Ben

Biodiesel education works.

You've got business questions. Ben has the quick and accurate answers. His experience as the nation's most trusted and trusted source for business information. Ben is now available to serve you through an online link to the National Biodiesel Board and the National Biodiesel Association of America. All the information that you need to grow your business.

Just Ask Ben!

What do you want to Ask Ben?

Your e-mail address:

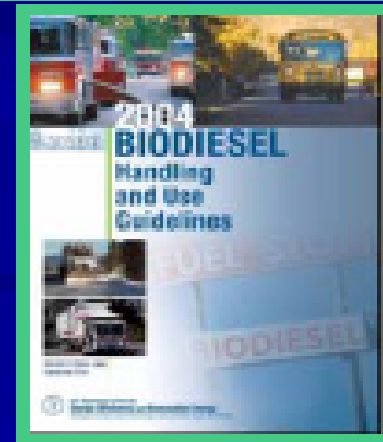
Company:

City:

State:

Zip:

Your e-mail will only be used to answer your question.





## Ultra-low Sulfur Transportation Fuels in Europe

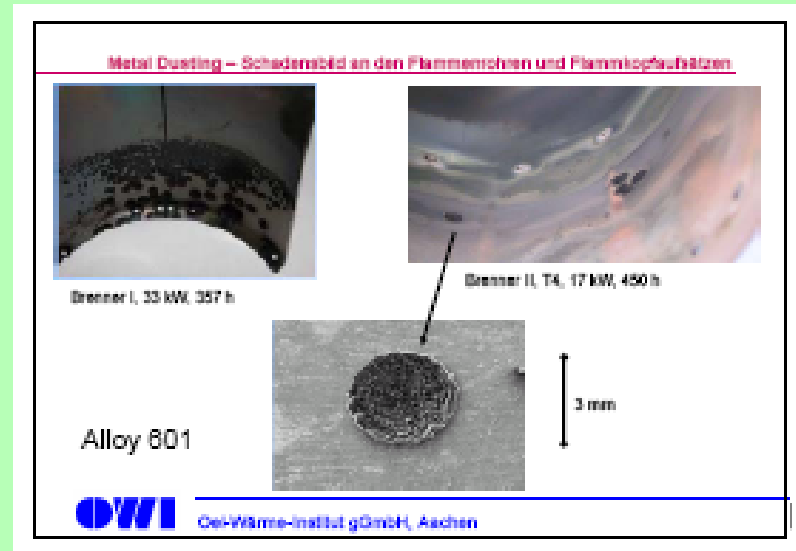
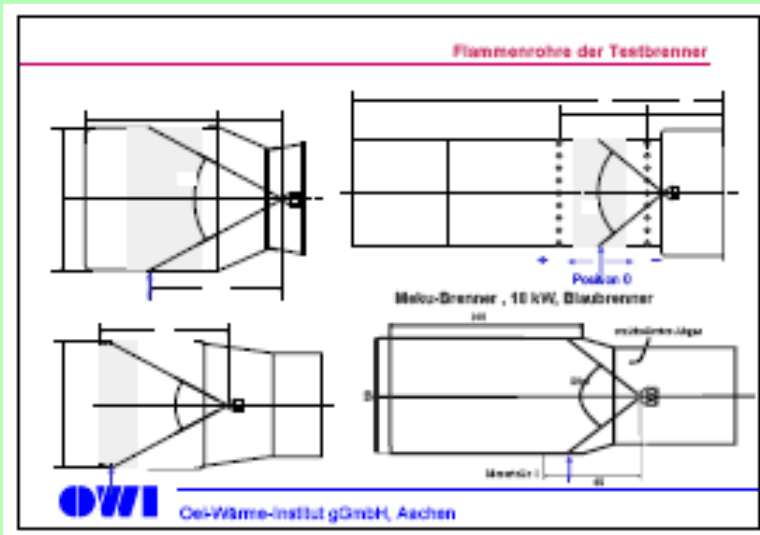
10 ppm S Gasoline

10 ppm S Diesel

EU Directive for Biodiesel

# European Ultra-low Sulfur Heating Oil Research

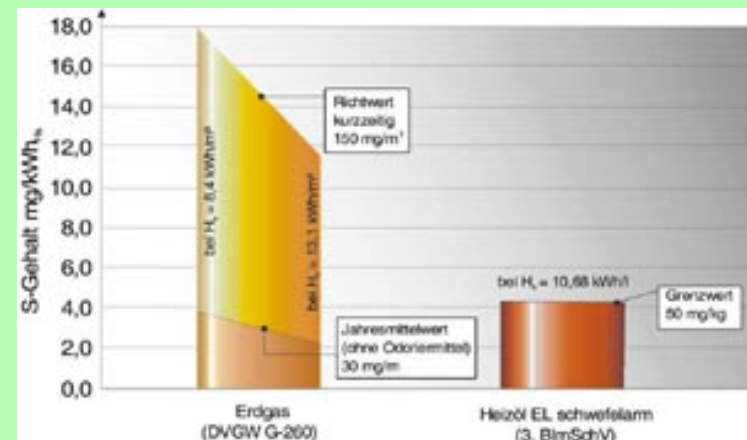
## Technical Issues with Burner Flame Tube Corrosion



# Ultra-low Sulfur Heating Oil in Germany

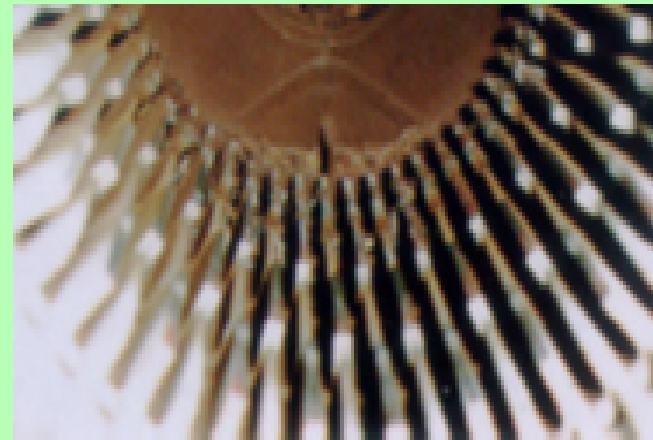
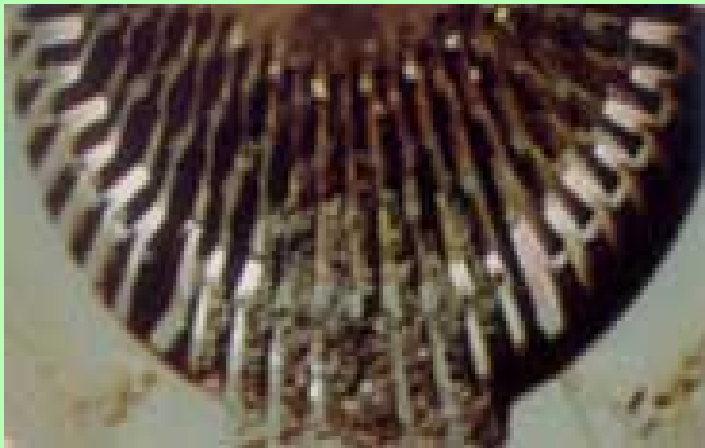
50 ppm Sulfur content

2 to 3 percent market share in 2005



# Ultra-low Sulfur Heating Oil in Germany

Cleaner boilers - just like natural gas



Thank You!

