

# Results of Marketer Biodiesel Use Survey

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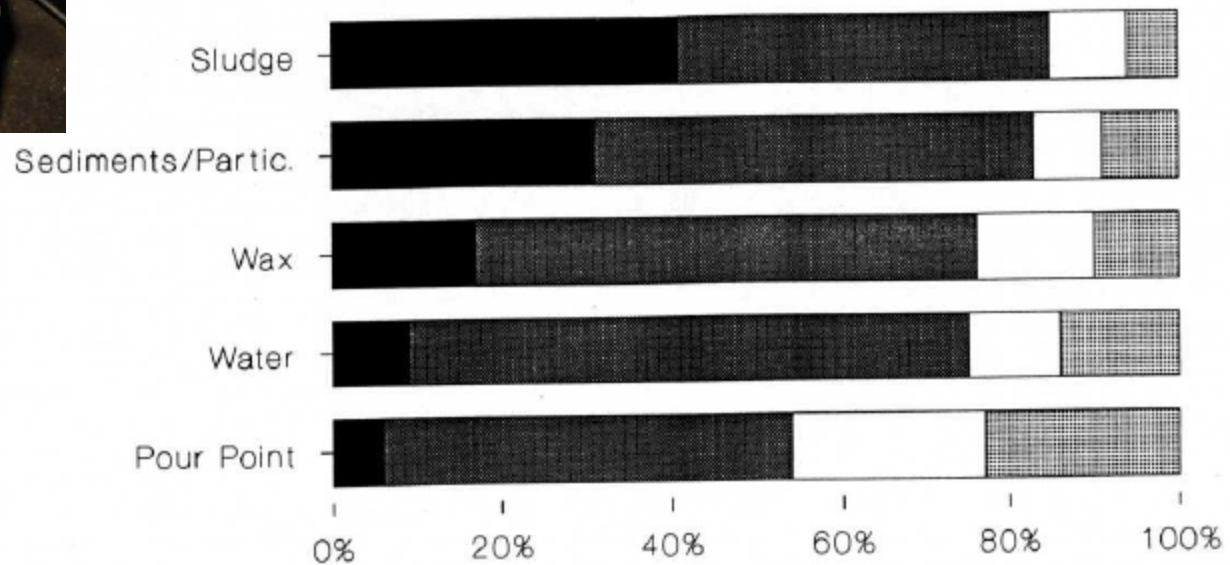
Technical Workshop  
Sept. 14, 2016

# Objective

- In the U.S. biodiesel is now being used widely in heating systems. In many cases the blend level is under 5% but there are also many users now at B-20 or higher.
- This experience base is unique in the world and provides an opportunity to identify technical challenges we should be focused on going forward.
- Key objective: identify where there are clear technical issues that should be the subject of future research.

# Prior related surveys – pre-biodiesel

What is the rate of occurrence of these fuel quality problems?



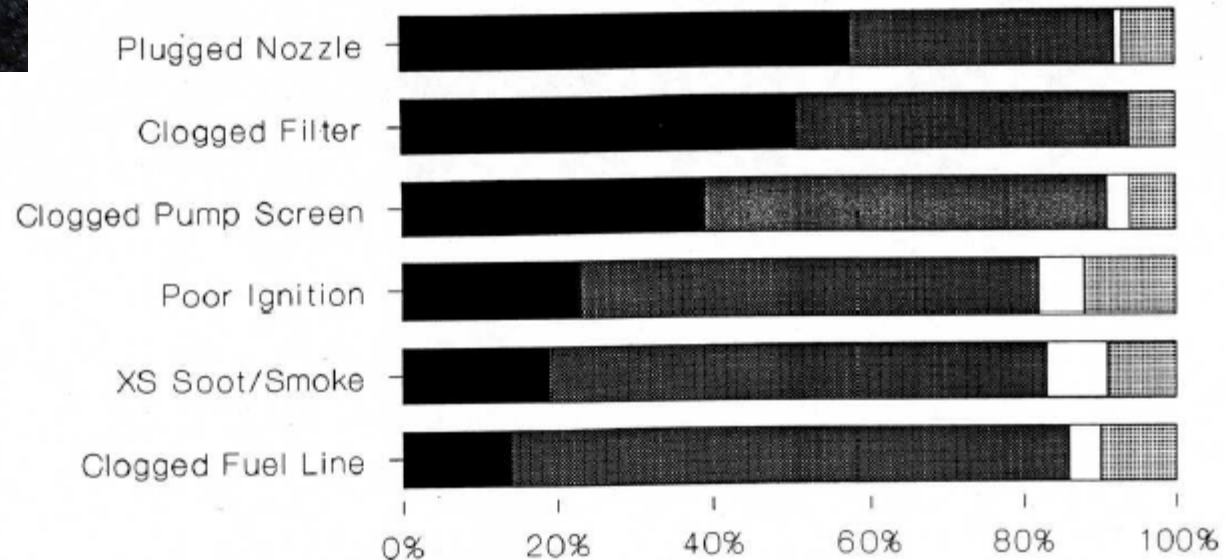
	Often (%)	Sometimes (%)	Rarely (%)	N/R (%)
Sludge	41.1	44.4	8.9	5.6
Sedin/Partic	31.1	52.2	7.8	8.9
Waxing	16.7	58.9	14.4	10.0
Water	8.9	65.5	11.1	14.4
Pour Point	5.6	47.8	23.3	23.3

Figure 1.

Reported frequencies of fuel quality problems

## Prior related surveys – pre-biodiesel

What is the rate of occurrence of these heating equipment problems?



	Often (%)	Sometimes (%)	Rarely (%)	N/R (%)
Plugged nozzle	57.8	34.4	1.1	6.7
Clogged filter	51.1	43.3	-	5.6
Clogged screen	38.9	52.2	3.3	5.6
Poor ignition	23.3	58.9	5.6	12.2
XS Soot/Smoke	18.9	64.4	7.8	8.9
Clogged fuel line	14.4	72.2	3.4	10.0

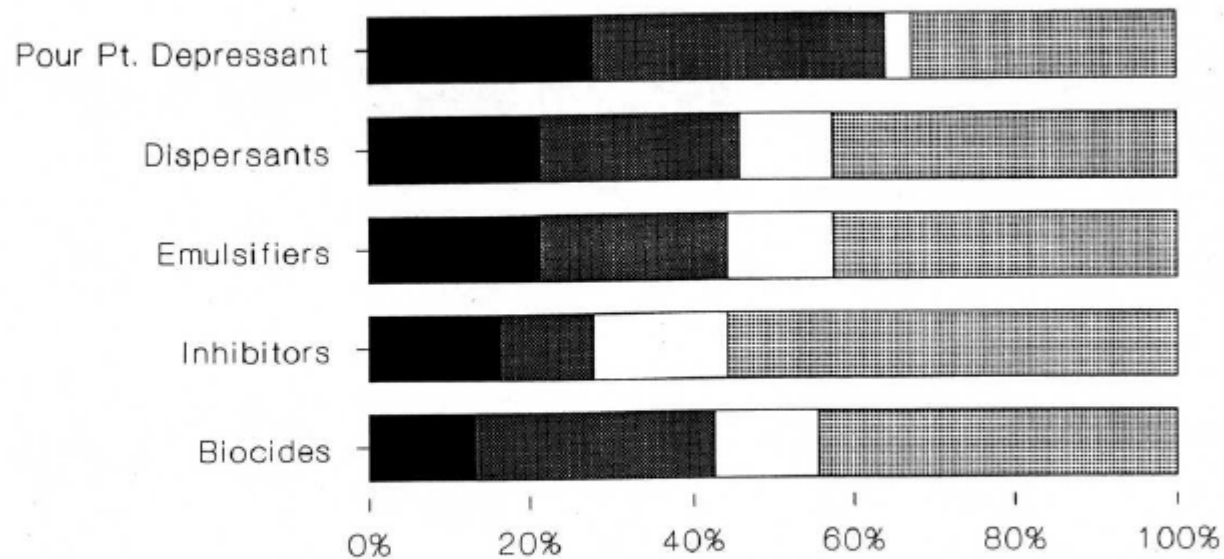
Often Occurs
  Sometimes Occurs
  Rarely Occurs
  N/R - No Response

Figure 2.

Reported frequencies of heating equipment problems

## Prior related surveys – pre-biodiesel

What is the frequency of use of additives to improve fuel quality?



	Often (%)	Sometimes (%)	Rarely (%)	N/R (%)
P. P. Depressants	27.9	36.1	3.2	32.8
Dispersants	21.3	24.6	11.5	42.6
Emulsifiers	21.3	23.0	13.1	42.6
Inhibitors	16.4	11.5	16.4	55.7
Biocides	13.1	29.5	13.1	44.3

Often Used
  Sometimes Used
  Rarely Used
  N/R - No Response

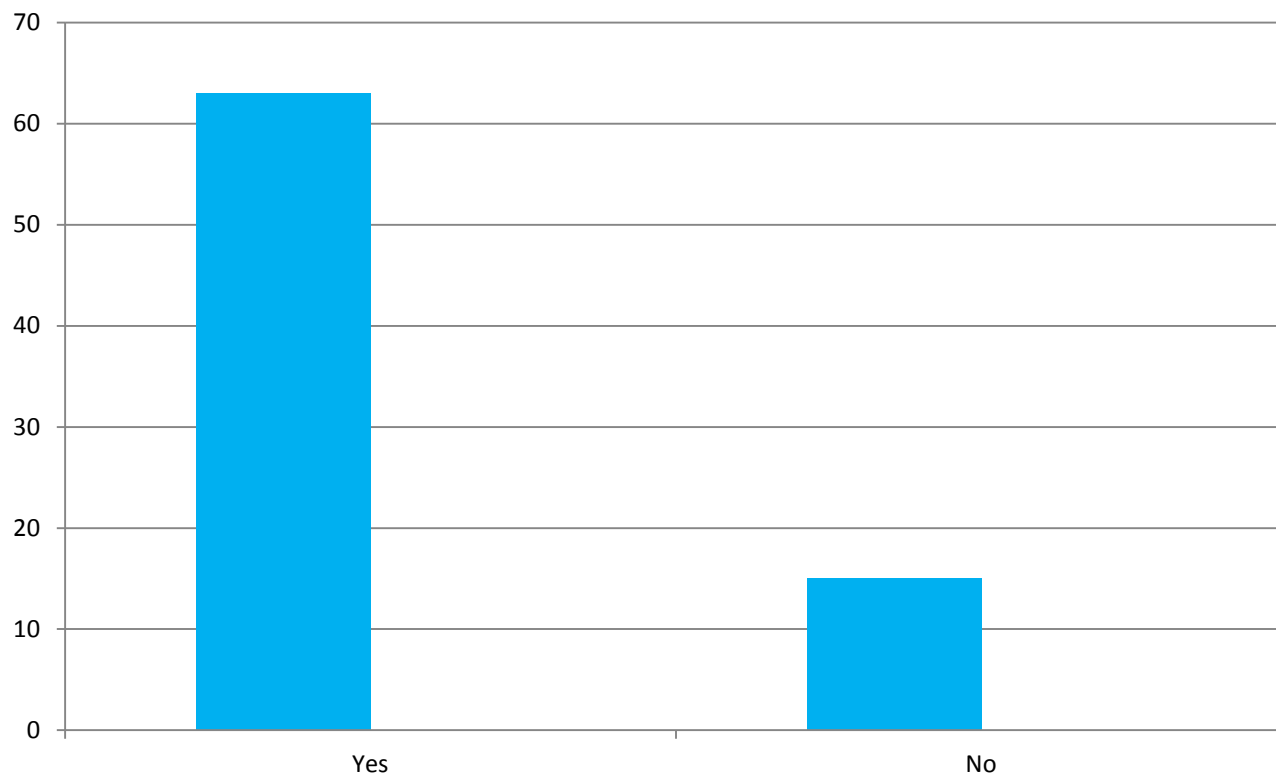
Figure 5.

Reported frequencies of additive use

# Biodiesel Use Survey – 2012-2013

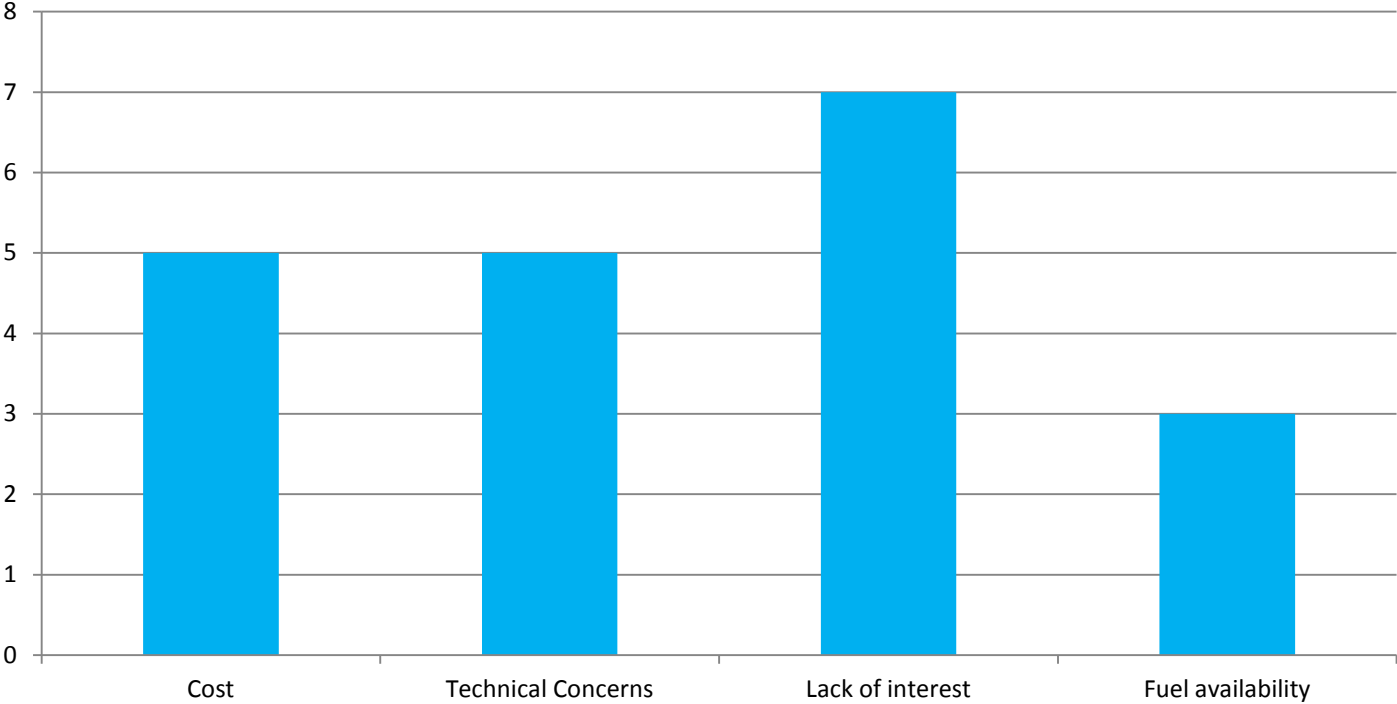
- Sent to users of the Bioheat logo
- Total responses ~ 75

# Have you marketed or used Bioheat at all?



Answer	Count	Percent answer
Yes	63	80.80%
No	15	19.20%

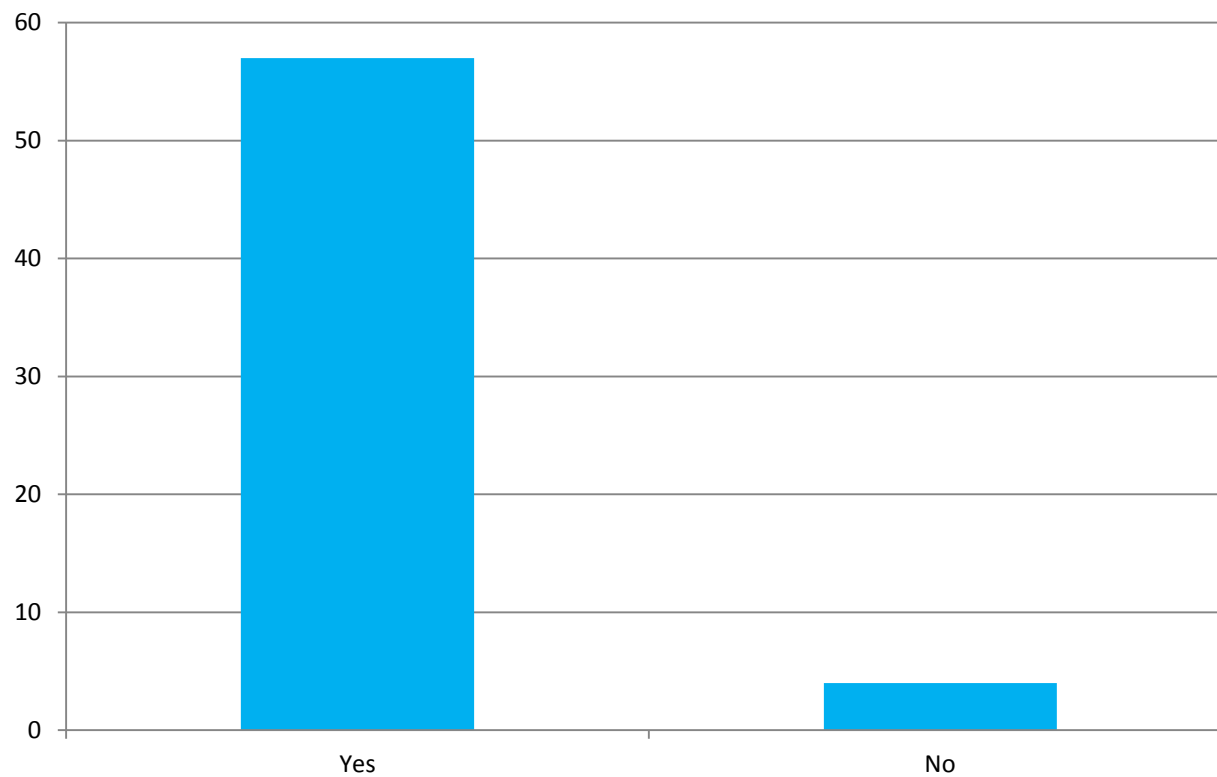
Reasons you have not been involved with Bioheat



Answer	Count	Percent answer
Cost	5	25.00%
Technical Concerns	5	25.00%
Lack of interest	7	35.00%
Fuel availability	3	15.00%

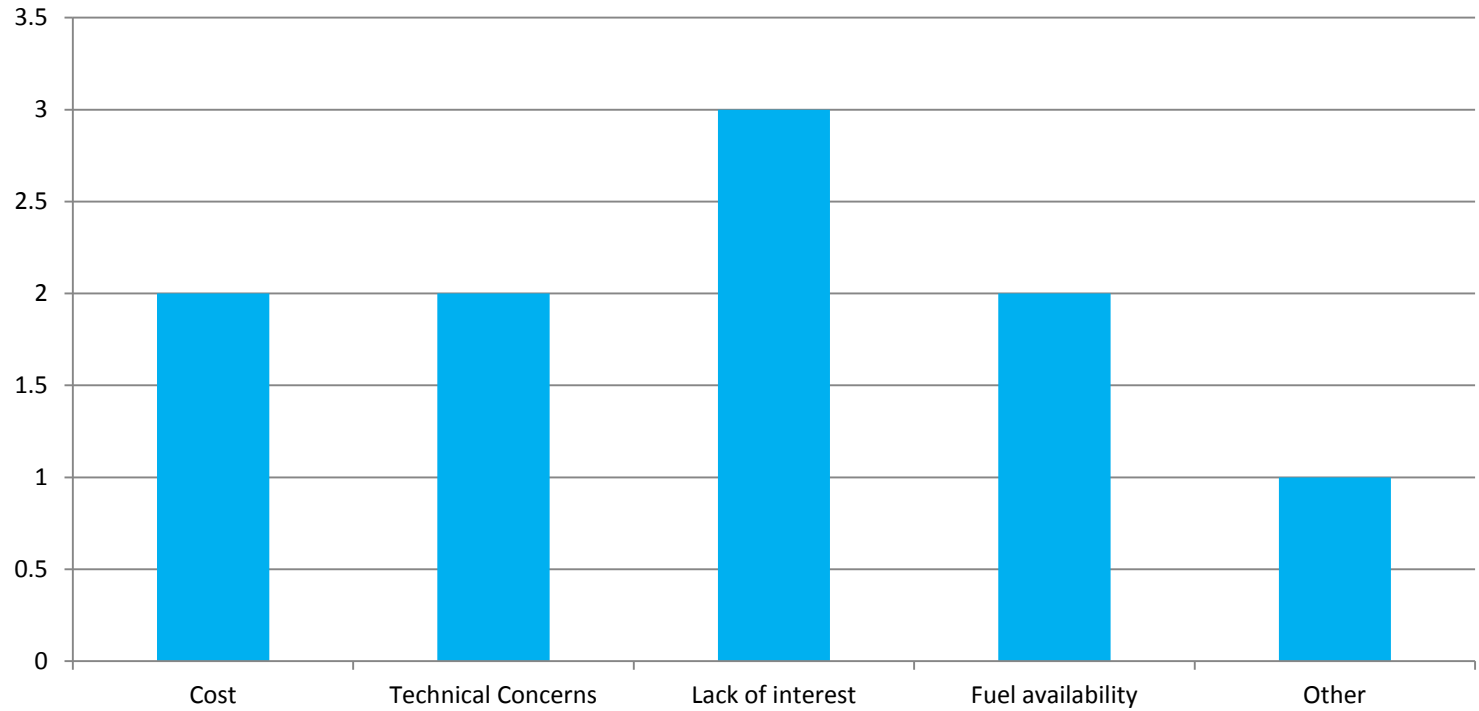


## Are you still marketing or using Bioheat?



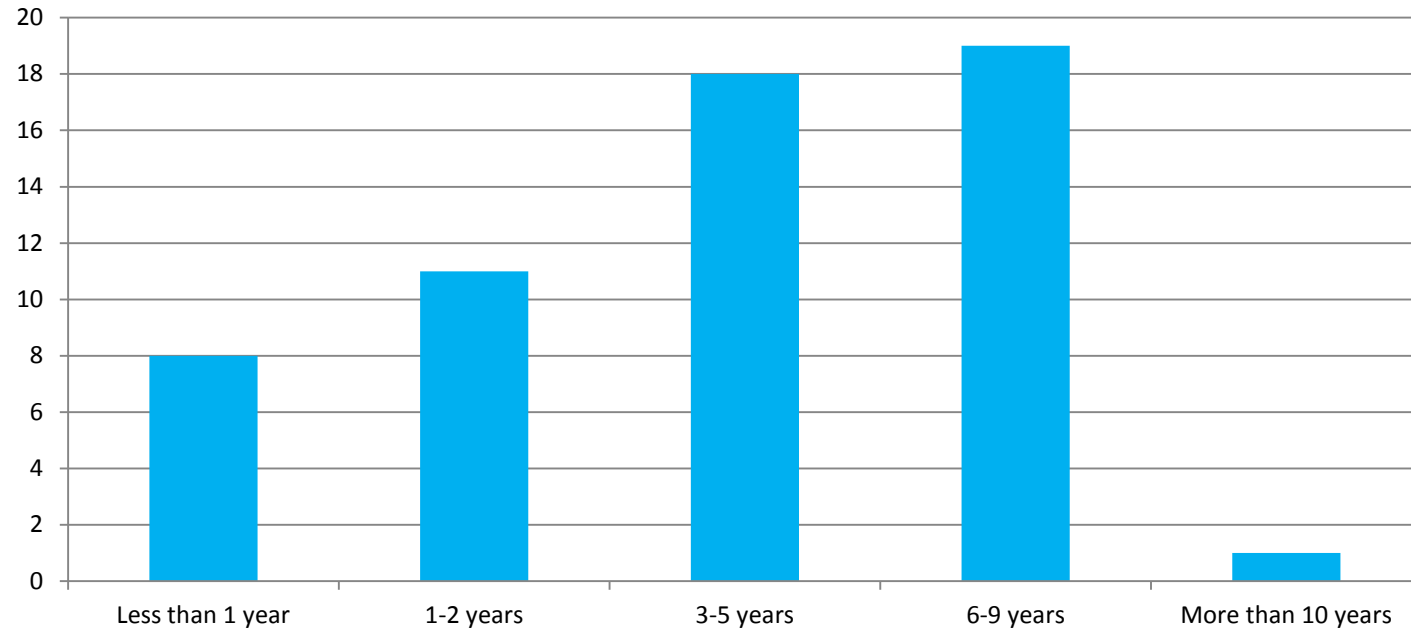
Answer	Count	Percent answer
Yes	57	93.44%
No	4	6.56%

## Reasons you have stopped using Bioheat



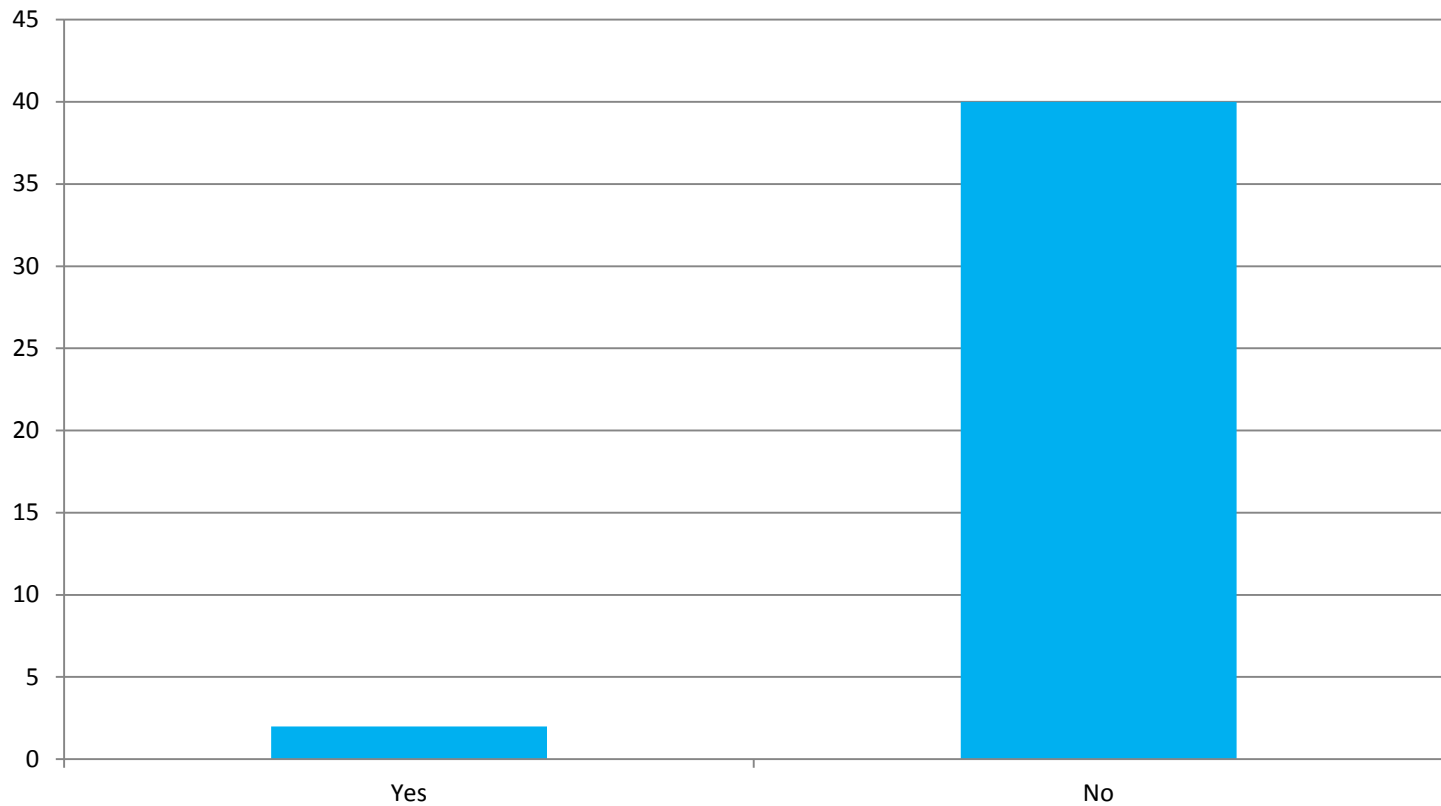
Answer	Count	Percent answer
Cost	2	20.00%
Technical Concerns	2	20.00%
Lack of interest	3	30.00%
Fuel availability	2	20.00%
Other	1	10.00%

## How long have you marketed or used Bioheat?



Answer	Count	Percent answer
Less than 1 year	8	14.04%
1-2 years	11	19.30%
3-5 years	18	31.58%
6-9 years	19	33.33%
More than 10 years	1	1.75%

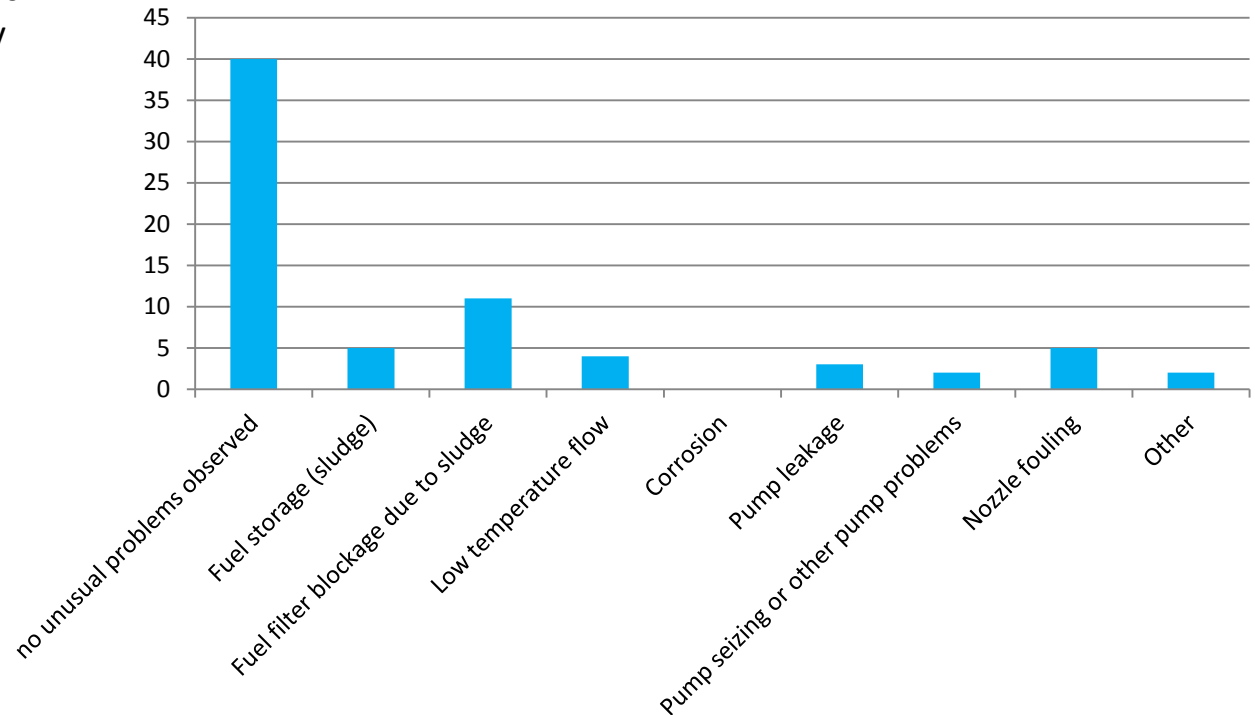
## With Bioheat use, do you change any system components?



Answer	Count	Percent answer
Yes	2	4.76%
No	40	95.24%

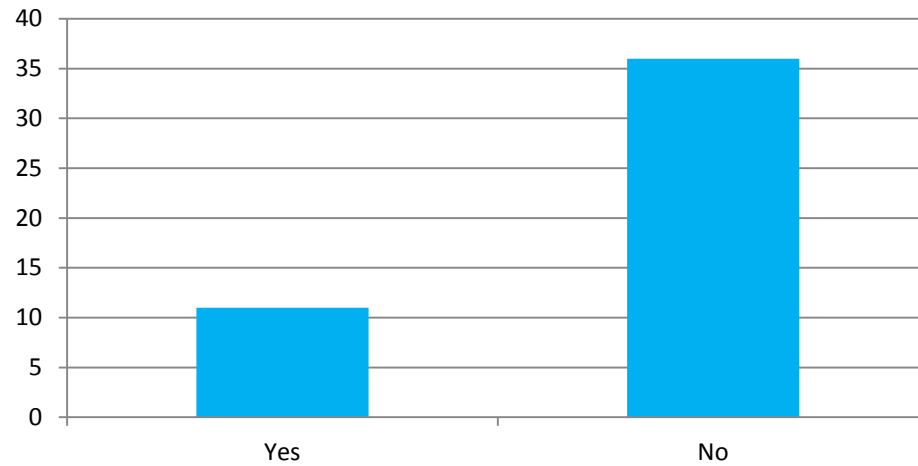
## Have you observed Biodiesel-related technical problems with:

Note – this question was to all users.  
A similar later question was to only those using higher blends.



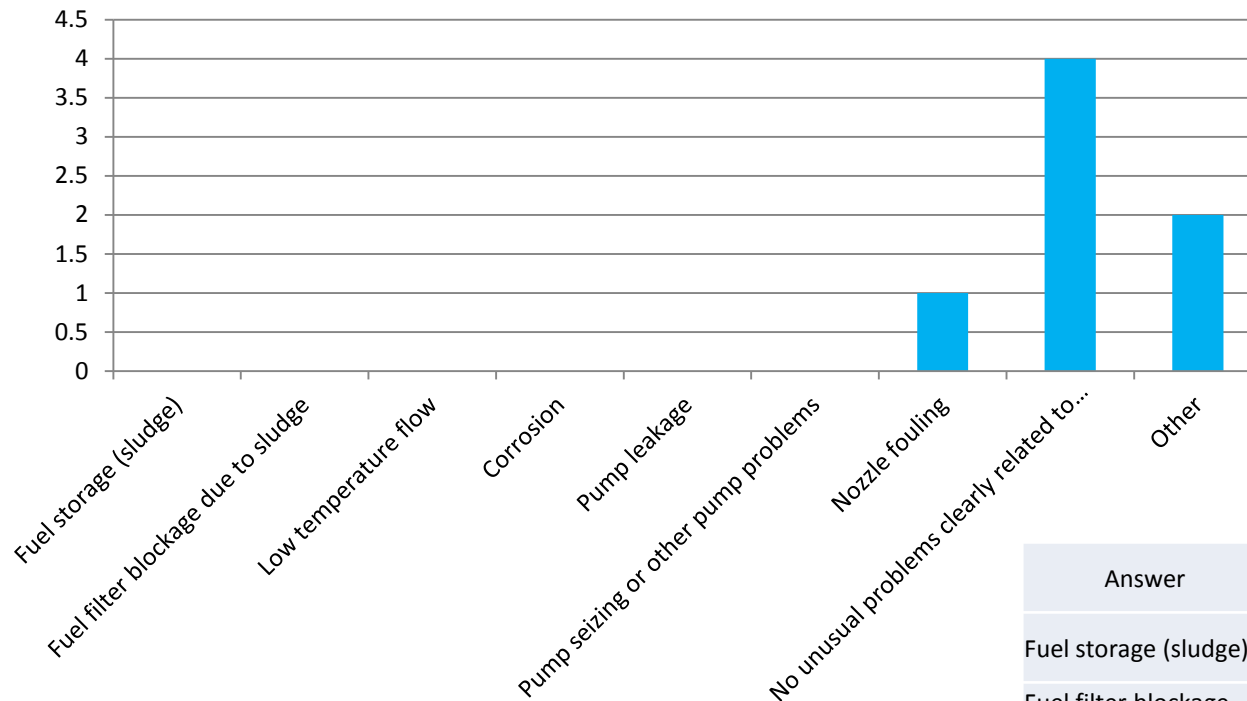
Answer	Count	Percent answer
no unusual problems observed	40	55.56%
Fuel storage (sludge)	5	6.94%
Fuel filter blockage due to sludge	11	15.28%
Low temperature flow	4	5.56%
Corrosion	0	0.00%
Pump leakage	3	4.17%
Pump seizing or other pump problems	2	2.78%
Nozzle fouling	5	6.94%
Other	2	2.78%

# Have you explored or done field tests with blends above B-20?



Answer	Count	Percent answer
Yes	11	23.40%
No	36	76.60%

# With higher levels of biodiesel, have you observed Biodiesel-related technical problems with:



Note – this question was only to those who are currently selling higher blend levels.

Answer	Count	Percent answer
Fuel storage (sludge)	0	0%
Fuel filter blockage due to sludge	0	0%
Low temperature flow	0	0%
Corrosion	0	0%
Pump leakage	0	0%
Pump seizing or other pump problems	0	0%
Nozzle fouling	1	14%
No unusual problems clearly related to biodiesel observed	4	57%
Other	2	29%

# 2016 Survey

Sought a larger audience

Three databases

- Users of BioHeat Logo

- Company Owner/ President/GM

- Service Managers

Similar questions with more effort to focus on biodiesel-specific concerns

## Responses

BioHeat Logo Users – 25

Owner/President/GM – 86

Service Managers - 22

Total responses - 133



# Users of BioHeat Logo

**\* Does**  
**(or has) your company deliberately deliver heating oil blended**  
**with biodiesel?**

Answer	0%100%	Number of Responses	Response Ratio
Yes	<div></div>	<a href="#">19</a>	76.0%
No	<div></div>	<a href="#">5</a>	20.0%
No Responses	<div></div>	1	4.0%
	Totals	25	100%

# Users of BioHeat Logo

**\* Reasons**  
**you have not delivered heating oil blended**  
**with biodiesel. (select all that apply)**









Answer	0%	100%	Number of Responses	Response Ratio
Cost	<div></div>		1	25.0%
Technical concerns	<div></div>		1	25.0%
Lack of interest by customers	<div></div>		2	50.0%
Lack of interest in your company	<div></div>		1	25.0%
Lack of knowledge in your company			0	0.0%
Heating Equipment manufacturers' recommendations			0	0.0%
Fuel availability	<div></div>		2	50.0%
Other			0	0.0%
	Totals		4	100%

# Users of BioHeat Logo

**\* Are**  
**you still delivering heating oil blended with biodiesel?**

Answer	0%100%	Number of Responses	Response Ratio
Yes	<div></div>	17	68.0%
No	<div></div>	2	8.0%
No Responses	<div></div>	6	24.0%
	Totals	25	100%

## Users of BioHeat Logo

Answer		Number of Responses	Rating Score*
Fuel filter blockage	 100%	8	3.0
Heat exchanger cleanliness	 12% 87%	8	2.8
Low temperature flow	 100%	8	3.0
Corrosion	 100%	8	3.0
Fuel pump leakage	 100%	8	3.0
Fuel pump seizing or other pump problems?	 100%	8	3.0
Nozzle fouling	 100%	8	3.0
Odors	 100%	8	3.0

~ 15,000 homes  
Mostly B-5 users

Owner / President / GM

\* Does  
(or has) your company deliberately deliver heating oil blended  
with biodiesel?

Answer	0%100%	Number of Responses	Response Ratio
Yes	<div></div>	<a href="#">35</a>	40.6%
No	<div></div>	<a href="#">51</a>	59.3%
No Responses		0	0.0%
	Totals	86	100%

## Owner / President / GM

### \* Reasons

you have not delivered heating oil blended with biodiesel. (select all that apply)

Answer	0%100%	Number of Responses	Response Ratio
Cost	<div></div>	<a href="#">15</a>	34.8%
Technical concerns	<div></div>	<a href="#">25</a>	58.1%
Lack of interest by customers	<div></div>	<a href="#">22</a>	51.1%
Lack of interest in your company	<div></div>	<a href="#">11</a>	25.5%
Lack of knowledge in your company	<div></div>	<a href="#">4</a>	9.3%
Heating Equipment manufacturers' recommendations	<div></div>	<a href="#">7</a>	16.2%
Fuel availability	<div></div>	<a href="#">12</a>	27.9%
Other ( <a href="#">View all</a> )	<div></div>	<a href="#">3</a>	6.9%
	Totals	43	100%

## Owner / President / GM

\* Which of the following fits your company best? (at present time)









Answer	0%100%	Number of Responses	Response Ratio
Deliver up to B-5 to all customers	<div></div>	<a href="#">15</a>	17.4%
Deliver B-20 to all customers	<div></div>	<a href="#">4</a>	4.6%
Deliver B-20 to some customers	<div></div>	<a href="#">3</a>	3.4%
Deliver blends at levels ABOVE B-20 to at lease some customers	<div></div>	<a href="#">5</a>	5.8%
No Responses	<div></div>	59	68.6%
	Totals	86	100%

Owner / President / GM

Up to B5

Answer		Number of Responses	Rating Score*
Fuel filter blockage	<div><div></div><div></div><div></div></div>	12	2.6
Heat exchanger cleanliness	<div><div></div><div></div><div></div></div>	12	1.8
Low temperature flow	<div><div></div><div></div><div></div></div>	12	2.7
Corrosion	<div><div></div><div></div><div></div></div>	12	2.6
Fuel pump leakage	<div><div></div><div></div><div></div></div>	12	2.6
Fuel pump seizing or other pump problems?	<div><div></div><div></div><div></div></div>	12	2.8
Nozzle fouling	<div><div></div><div></div><div></div></div>	12	2.7
Odors	<div><div></div><div></div><div></div></div>	12	2.5



Answer		Number of Responses	Rating Score*
Fuel filter blockage		3	2.3
Heat exchanger cleanliness		3	1.7
Low temperature flow		3	3.0
Corrosion		3	3.0
Fuel pump leakage		3	3.0
Fuel pump seizing or other pump problems?		3	3.0
Nozzle fouling		3	2.3
Odors		3	1.7

## Service Managers

\* Which of the following fits your company best? (at present time)

Answer	0%	100%	Number of Responses	Response Ratio
Deliver up to B-5 to all customers	<div></div>		6	27.2%
Deliver B-20 to all customers	<div></div>		1	4.5%
Deliver B-20 to some customers	<div></div>		0	0.0%
Deliver blends at levels ABOVE B-20 to at lease some customers	<div></div>		0	0.0%
No Responses	<div></div>		15	68.1%
	Totals		22	100%

## Service Managers B-5

Answer		Number of Responses	Rating Score*
Fuel filter blockage	16% 33% 50%	6	2.3
Heat exchanger cleanliness	50% 50%	6	2.0
Low temperature flow	33% 66%	6	2.7
Corrosion	16% 83%	6	2.8
Fuel pump leakage	16% 83%	6	2.8
Fuel pump seizing or other pump problems?	33% 66%	6	2.7
Nozzle fouling	16% 83%	6	2.7
Odors	100%	6	3.0

2 Service Managers;  
1 with 1600 customers  
1 with 1000 customers  
Both still delivering B-5

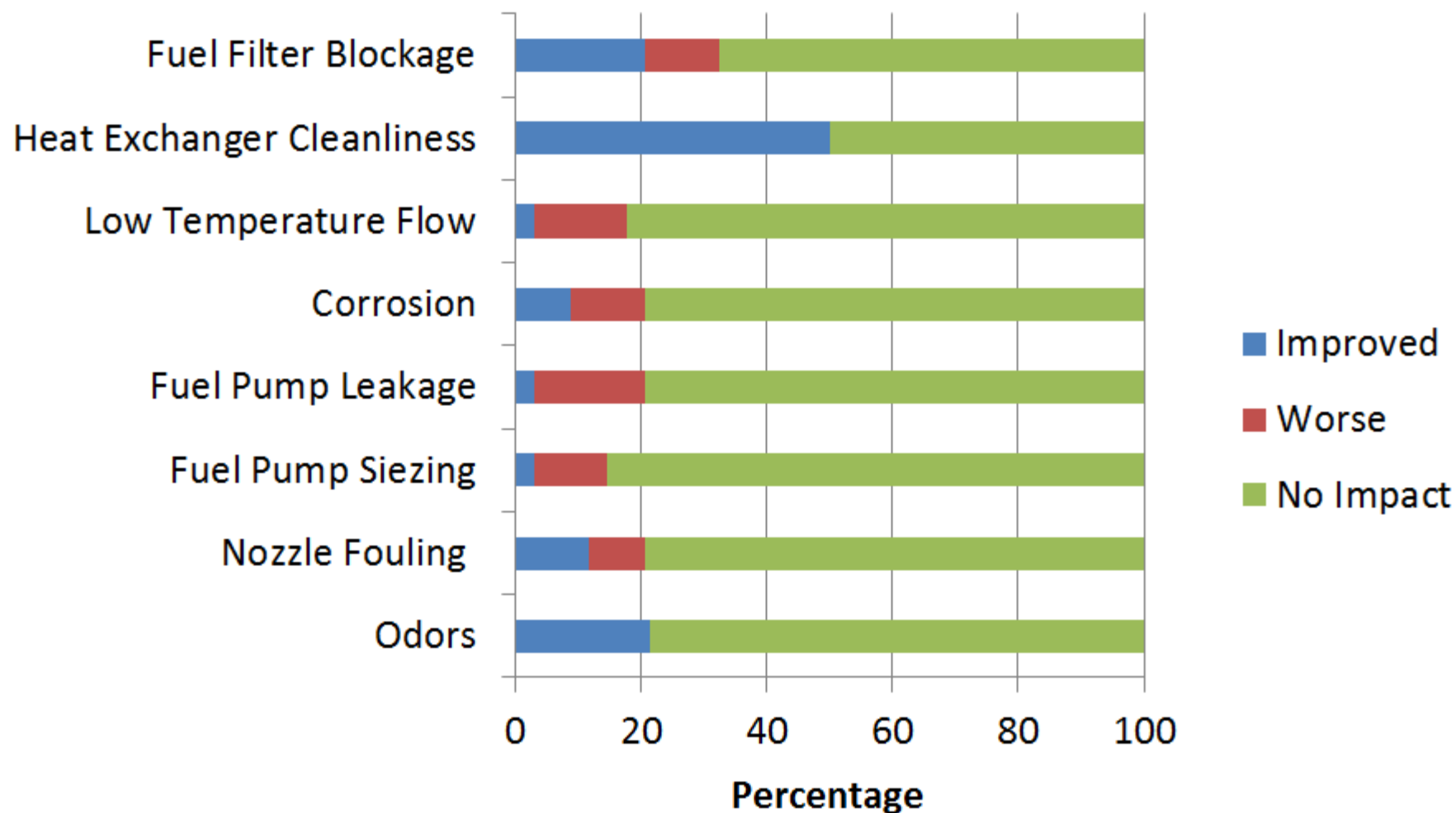
# Service Managers

\* With biodiesel  
blending, do you change any heating system components?

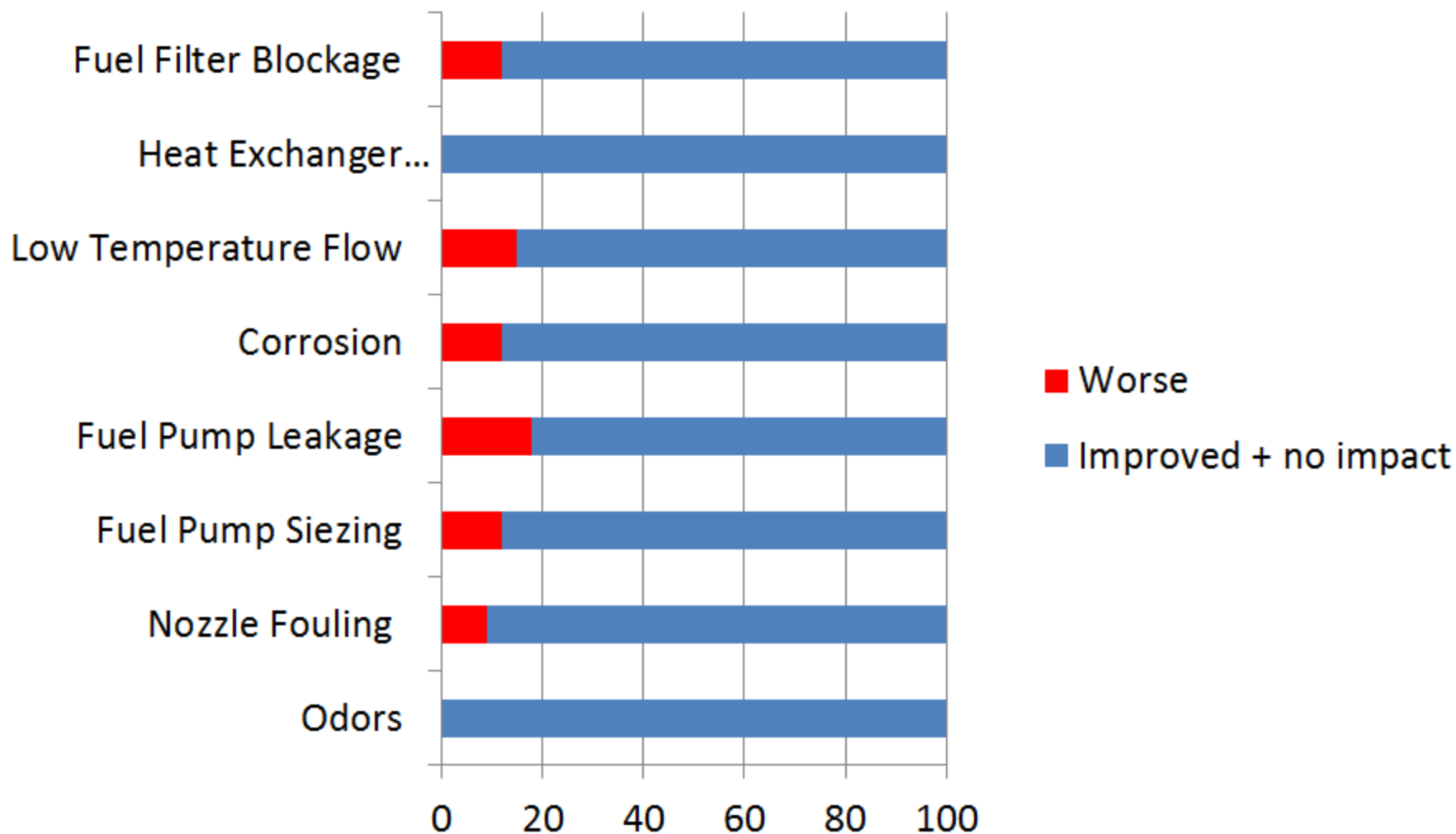
Answer	0%100%	Number of Responses	Response Ratio
Yes	<div></div>	3	13.6%
No	<div></div>	4	18.1%
No Responses	<div></div>	15	68.1%
	Totals	22	100%

[View comments \(2\)](#)

## Combining all responses



## Combining all responses



# Conclusions

- Experience with biodiesel varies among users;
- Groups which started with BioHeat are still marketing it;
- Many respondents are not yet using biodiesel;
- Reasons for not using biodiesel vary but certainly include technical concerns, interest, and availability;
- The dominant response on technical issues is positive but some concerns are reported;
- Difficult to identify concerns which are clearly a problem.