

NORA Board Meeting
Hershey Lodge, Pennsylvania
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United States: +1 (571) 317-3112- Access Code: 189-365-349
- One-touch: <tel:+15713173112,,189365349#>
May 21, 2019
12.30 p.m.

- I. Introduction – Chairman Charles Uglietto and President John Huber
- II. Approval of Minutes
- III. NORA Extension – John Huber
- IV. Financial Information – Treasurer Eric Degesero
 - a. 2018 Year End Financials
 - a) Allocation of Budget Shortfall
 - b. Audit Status and Update
 - c. First Quarter Financials
 - d. Informational Reports - State Allocations
 - State Disbursements
- V. 2020 and 2021 Budgets – Charles Uglietto and John Huber
- VI. Research and Development – Director of Laboratory Dr. Thomas Butcher
 - a. Review of Lab Operations
 - b. Review of Outside Projects – Richard Sweetser
 - c. Technology Workshop Tom Butcher and John Huber
- VII. Education and Training Activities – Don Farrell and John Levey
 - a. Gold Courses – Newly Completed and Online
 - b. Revision to Exams and Silver Book
- VIII. Energy Efficiency
- IX. Executive Committee and Officers – First Vice Chairman Proposed
- X. Old Business –
- XI. New Business
- XII. Adjournment

Minutes
Board of Directors
National Oilheat Research Alliance
September 24, 2018
Newport, Rhode Island

I. Introductions and Opening Remarks

Mr. Tom Santa called the meeting to order at 12:41 pm EST and directed Mr. John Huber to call the roll. Mr. Huber called the roll and the following members of the Board were present.

Al Breda
Allison Heaney
Bruce Harris
Charles Ugiletto
Chris Daly
Daniel Singer
Eric Degesero
Greg Anderson
Joe Kennan
Joe Willis
John McCusker
John Miles
Kate Childs
Ken Russ
Kevin Conti

Kirk Darby
Matt Meehan
Michael Januario
Mike Estes
Natalie Mondsini
Peter Boutte
Quincy Longacre
Scott Hacker
Steve Clark
Steve McCracken
Susan Hammond
Ted Noonan
Tom Santa (Chairman)
Will Berry

Mr. Huber announced that quorum was met with a combination of in-person and phone attendees and the meeting was called to order at 12:45 pm EST. Mr. Huber discussed the state of NORA and where NORA currently stands regarding funding, leadership, consumer education, research and development and education. Mr. Huber stated that NORA currently has a great story and that a personal goal of NORA's is to focus on thought leaders to tell the story. Leadership changes include: Mr. Tom Santa will be done serving his term as chairman and Mr. Charlie Ugiletto will be NORA's new upcoming chairman. Mr. Roger Marran and Mr. Eric DeGesero both will be exiting the board and executive committee as their terms expire on 12/31/18. Mr. Huber stated that term limits were mandatory and necessary and he urged people to get involved in the different committees and boards.

II. Approval of Minutes

A motion to approve the minutes from the May 22, 2018 board meeting was made by Mr. Charlie Ugiletto, seconded by Ms. Allison Heaney and approved by voice.

III. Financial Information – Treasurer Mr. Eric Degesero

Mr. Degesero discussed the 2017 audit that was distributed and reviewed at the meeting in May.

Mr. Degesero discussed the board packet that was distributed. He stated, “on page 13 you will see the accompanying management letter dated June 5, 2018. I would note, that this was received on September 10, 2018 – page 10”.

The report identifies material weaknesses and significant deficiencies.

- *Material weakness* – deficiency or combination of deficiencies in an internal control that may reasonably result in a material misstatement in the financial statement.
- *Significant deficiency* – a deficiency or combination of deficiencies in an internal control that is less severe than a material weakness but important enough for the auditor to mention.

There were two material weaknesses:

First, is the tracking of contracts with vendors on R&D projects. There were a couple of items where contractors had finished items and had not yet submitted reports or invoices. This has evolved from Richard Sweetser tracking contracts and payments. Now all of that is done by the accounting firm, and invoices and payments are all processed and reviewed by them.

The second issue had to do with an adjustment to the grants to the states for 2017. During the year, adjustments had to be made to the budgets to compensate for the warm winter in 2017. This required adjustments to each of the state accounts by category and to the national account. In communicating this budget change, the accounting firm failed to adjust the budget for the states for the consumer education column. A new reporting schedule will allow the President to see those changes after they are made.

Mr. Degesero moved on to discuss the significant deficiencies.

He stated that, collections are received either electronically or by check. Unfortunately, they are often separated from the return which creates the account receivable. As indicated in the response, two receivables were created when the report submitted by the wholesaler for the NORAable gallons they sold. However, the receivable was not linked to the payment received. This will require an additional level of review which we have already incorporated. The total amount in question for the two, one-time receivables was \$45,000.

Finally, there is the salary issue. The accounting firm has been doing a final adjustment to all salary related items and classification throughout the audit. They have now adjusted the general ledger, so that this occurs during the transactional phase, prior to the audit.

Mr. Degesero stated that the auditor encountered no difficulties nor disagreements with management in performing the audit which can be found on page 11.

Mr. Degesero moved to make a motion to accept the 2017 audit.

A motion was made by Ms. Kate Childs to accept the 2017 audit, it was seconded by Mr. Charlie Ugliletto and duly approved by voice.

Mr. Degesero went on to review the first eight months of 2018. As a reminder on a quarterly basis the first quarter represents approximately 44% of annual revenue, the second 12%, the third 11%, and the fourth 33%.

The first quarter of 2018 had a prolonged cold stretch however a warm February meant the quarter's degree days were slightly warmer than normal. For New England, the weather on a census adjusted basis was 6 percent warmer than normal, and for the mid-Atlantic, approximately 3 percent warmer than normal.

Through eight months we have total revenues of \$5,995,743 (page 16, column 2). Netting refunds of \$696,497 from this results in collections of \$5,299,246 (collection costs are included in the total). This represents approximately 56% of our expected net revenue for the year. Our expectation for the 3rd quarter, based on history, is a net of \$1.5 million. And if the fourth quarter is normal, the net revenue should be about \$3 million. This would mean we would finish the year with \$9.9 million in revenue. The budget for 2018 was \$9.4 million.

Mr. Degesero discussed the next item on the statement of activities which was the in-kind contributions and grants. NORA has just completed a contract with NBB for nearly \$180K to support the progress towards higher blends of biodiesel. This is obviously due to the good work of Dr. Butcher.

The next items discussed were the various program expenses. Please remember, the state payments are recorded as an expense on Day 1 of the year. NORA's expenses are largely in line with the completion of 2/3 of the year. One of the cost drivers for the consumer education is the website for certifications. NORA recently changed the program for that which necessitated a month of overlapping payments, and expenses associated with the transition. The new program is cheaper and should require much less affiliated expenses.

The salary line continues to be over budget due to some legal expenses being allocated to that line. Most other expenses are below budget at this point. NORA is now working on the annual report which is largely done by the audit, however, between accounting fees and the annual report, we should be close to budget.

Mr. Degesero then discussed the balance sheet- Page 18 of the handout.

The most significant item there is the change in the total grants payable. The amount held in accounts by the states is continuing to decrease. In 2017, this number was nearly \$9.7 million, it is now closer to \$7.8 million, or a \$1.9 million decrease. Thus, the states are now catching up to spending and reducing old balances.

The other significant items are the research and development not yet obligated. This has risen due to underspending last year. NORA has a lease on its lab as well as three employees there, so money was put aside in case NORA's reauthorization does not occur. There was a dramatic decrease in the contracts under obligation. NORA has not done a new RFP based on uncertainty of funding.

Mr. Degesero noted that there were two schedules in the packet that are informational.

The first is a list of states and their percentages (p. 39-42) and the other is a tracking of state spending by year (pp.19-38). Mr. Huber discussed these handouts in detail and there were no questions or comments.

IV. Research and Development || V Director of Laboratory Dr. Thomas Butcher

a. Review of Lab Operations

Dr. Butcher discussed the research facility located in Plainview, NY, on Long Island, the 3,500-square-foot facility is operated by NORA. Dr. Butcher stated that the lab is fully functional with two new full time employees; Neehad Islam – Mechanical Engineer, Stony Brook University and Ryan Kerr –Chemical Engineer, Stony Brook University.

Dr. Butcher discussed the internal R&D projects.

Dr. Butcher gave the following status update on the projects below:

1. Tankless Coil Boilers (Best Practices with NYSERDA)
 - All experimental work complete
 - Hot water production efficiency ranged from 33 to 67%
 - Impact of increased hot water efficiency on annual fuel use ~ 15%
 - Key Best Practices recommendations: Minimize jacket heat loss; improved thermal coupling between boiler water and DHW to enable lower water temps
 - Project report is completed and report is available.
2. Mini-split Heat Pumps Field Study (Best Practices with NYSERDA)
 - Co-funded project to look at 5 of 6 Field Sites
 - Study of why and how these heat pumps are being installed and how they are controlled
 - Best practices guide to be developed
 - Six sites to be included in New York
 - Five sites were monitored last heating season, the sixth site will be done this heating season
 - Planning to add one additional plus more sites in New England
 - Project in progress
 - Key findings to date: Heat pumps often installed to solve a local problem, control of operation of both boiler and heat pump informally implemented
3. Field Study of Blends of 10% Ethyl Levulinate

- Dead River Company in Maine
 - 11 homes, service technicians
 - Strong support from the NORA lab
 - Tests started in December 2017
 - Results of field tests: Analysis indicated fuels well mixed and did not separate even under very cold conditions
 - One problem observed with one specific fuel pump solenoid. Alternative pump now being used
 - NORA explored elastomer response – swell typically high
 - Test will continue to Spring 2019
 - Overall test considered successful. Plans under development for a single-boiler, EL100 test this year
 - Studies to identify a suitable pump for EL 100 in progress
4. Impact of Copper on Fuel Stability
- A range of studies conducted on impact of copper exposure on degradation of petroleum No. 2 and biodiesel blends
 - Results show very strong effect if the surface to volume ratio is high
 - Efforts to evaluate practical impact in heating systems has not yet developed a case for replacing copper lines. Work in progress
 - Publication with REG on this work prepared for submission to a Journal
5. Biodiesel Studies (with NBB)
- Basic studies of separation, stability, elastomer compatibility, of EL/petroleum (No. 2) blends
 - Studies to achieve high biofuel blend level with EL/biodiesel/No. 2 oil
 - Basic studies on synthetic diesel properties for use as heating oil
 - Stability and low temperature flow properties of EL very good
 - Clear concern about elastomer
 - Synthetic diesel shows outstanding stability properties
6. Combustion Studies
- Cad Cell steady state and transient response with a range of fuels
 - Steady state combustion and emissions with a range of fuels
 - In-burner performance of regulator pistons, field samples, B0 and B20
 - Tear-down and examination of field samples, B0 and B20
7. Biodiesel Review
- A comprehensive report has just been completed covering much of the earlier work done on biodiesel blends – combustion, field testing, pump testing, stability, and elastomer compatibility. Purpose – to document this earlier works

b. Outside projects

Mr. Sweetser gave a presentation on the study comparing heating oil, biodiesel

and advanced biodiesels with natural gas. Mr. Sweetser indicated that this is a production through heating the home study. The ratios of equivalence increased slightly from the previous report due to better equipment in use and the cessation of LNG imports. Once finalized this study will be on the NORA website and made available.

c. Technology Conference It is going on now, and everyone is welcome to attend and participate.

d. Future Fuels

- R&D Focus Areas for the Near Future
- EL-10 Field Studies
- EL-100 Commercial Boiler Test
- Air Source Heat Pump Field Study
- Explore other wood-based fuels
- Resilient Heating Systems
- Domestic Water Heating
- Continued Fuel Stability / Quality Studies
- Lubricity Evaluation from Field Samples
- SMTI – Testing with Biodiesel and EL (NYSERDA Proposal)
- Field Trials with the Babington Burner
- Other Advanced Burner Concepts
- Remote Diagnostics and Controls (again)
- Tests to Support Novatio at NORA?
- Pushing the Envelope on Biodiesel Blend Levels – with NBB

VI. Education and Training Activities

Mr. Levey discussed the online education system and that NORA has been working to become active in the online education space. The online education system currently has 23,000 technicians in the database, and 15 percent of them are active users.

Technicians can get CEU's online, there are currently 20 videos online for continuing education.

Mr. Levey discussed the NORA Gold certification and that all eight classes are actively running. NORA is also working to recognize manufacturers classes that can be used toward NORA Gold certification. TACO, Peerless etc. have classes that are equivalent to NORA classes and that can be used in place of a NORA class.

NORA will be conducting a train the trainer at Planview Lab to help make classes more accessible. Some companies rate pay on certification and certifications are offered in some areas so NORA is working to have a central classroom for technicians looking to earn Gold certification.

Mr. Levey discussed that several CEU programs have been added to the learning.noraweb.org website this year and we are working with various manufacturers to add additional online classes. Many of the videos were created by NORA and others have been produced by manufacturers of heating equipment and approved by NORA. As NORA identifies additional quality instructional videos, they will be added to the site.

b. Steam and Controls – These two books are in final revision and should be completed by the end of the year.

VII. Consumer and Internal Education

a. Outreach to Groups

The new website has been a great outreach tool for NORA. State rebates, CEU's from companies, questions etc. are funneled through the new website. NORA is consistently working to improve digital communication by adding different offerings and ways to communicate. Currently NORA communicates through the following vehicles: NORAweb.org; Learning.NORAweb.org; Press Releases; and Article.

b. Ideas for Messaging and Outreach

Mr. Farrell stated that NORA is constantly looking for writers and stated that they could email him if they are interested or know someone interested in being a featured writer.

NORA plans to introduce a regular series of educational content “e-newsletters” geared for technical personnel. The content will include service tips/help/updates; educational opportunities and research updates.

VIII. Energy Efficiency This is generally done by the states through rebates, and NORA is largely limited to reviewing these activities.

IX. Executive Committee and Officers

Mr. Huber discussed the executive committees and officers. He talked about upcoming expiring terms as well as newly nominated officers. After a brief background about new officers a motion for acceptance of new officers was made by Mr. Ted Noonan, seconded by Mr. Steve McCracken and approved by voice.

XI. Old Business There was no old business.

XII. New Business

There was no new business.

XIII. Adjournment

Mr. Chairman adjourned the meeting at 2:13pm.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

DECEMBER 31, 2018 AND 2017

DRAFT

**These financial statements
may be reproduced only
in their entirety.**

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

DECEMBER 31, 2018 AND 2017

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INDEPENDENT AUDITOR'S REPORT

The Board of Directors
National Oilheat Research Alliance, Inc.
Alexandria, Virginia

Scope

We have audited the accompanying financial statements of the National Oilheat Research Alliance, Inc. (the Alliance), which comprise the statements of financial position as of December 31, 2018 and 2017, and the related statements of activities, functional expenses, and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Alliance's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Alliance's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

The Board of Directors
National Oilheat Research Alliance, Inc.
Alexandria, Virginia

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Alliance as of December 31, 2018 and 2017, and the changes in its net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Emphasis of Matter

As discussed in Note 11 to the financial statements, in 2018, the Alliance adopted Accounting Standards Update No. 2016-14, *Not-for-Profit Entities (Topic 958): Presentation of Financial Statements of Not-for-Profit Entities*. Our opinion is not modified with respect to this matter.

Report on Supplementary Information

Our audit was conducted for the purpose of forming an opinion on the financial statements as a whole. The Schedules of Expenses by State/Jurisdiction on pages 14-17 for the year ended December 31, 2018, are presented for purposes of additional analysis and are not a required part of the financial statements. Such information is the responsibility of management and was derived from and relates directly to the underlying accounting and other records used to prepare the financial statements. The information has been subjected to the auditing procedures applied in the audit of the financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the financial statements or to the financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States of America. In our opinion, the information is fairly stated in all material respects in relation to the financial statements as a whole.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

STATEMENTS OF FINANCIAL POSITION
DECEMBER 31, 2018 AND 2017

ASSETS

	2018	2017
ASSETS		
Cash	\$ 9,151,550	\$ 9,343,450
Assessments receivable	3,086,323	2,987,247
Prepaid state assessments	137,970	217,360
Other assets	<u>112,632</u>	<u>78,190</u>
TOTAL ASSETS	<u>\$ 12,488,475</u>	<u>\$ 12,626,247</u>

LIABILITIES AND NET ASSETS

LIABILITIES		
Accounts payable	\$ 760,957	\$ 1,098,309
Refunds payable	337,662	318,984
State grants payable	3,084,544	3,389,090
Obligation for unallocated state rebates	1,988,799	2,615,817
Other liabilities	<u>68,175</u>	<u>45,619</u>
TOTAL LIABILITIES	<u>6,240,137</u>	<u>7,467,819</u>
NET ASSETS		
Net assets without donor restrictions available for obligation - other than for consumer education, safety, and training	642,774	431,117
Designated net assets:		
Pre-2014 reauthorization net assets	55,933	55,933
National spending not yet incurred:		
Research, development, and demonstration - not yet obligated	5,098,554	3,779,596
Research, development, and demonstration - obligated under contract	316,580	750,328
Heating oil efficiency and upgrade - not yet obligated	123,040	110,763
Heating oil efficiency and upgrade - obligated under contract	-	-
Consumer education, safety, and training - not yet obligated	11,457	30,691
Consumer education, safety, and training - obligated under contract	<u>-</u>	<u>-</u>
Total net assets without donor restrictions	<u>6,248,338</u>	<u>5,158,428</u>
TOTAL LIABILITIES AND NET ASSETS	<u>\$ 12,488,475</u>	<u>\$ 12,626,247</u>

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

STATEMENTS OF ACTIVITIES
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	<u>2018</u>	<u>2017</u>
CHANGE IN NET ASSETS WITHOUT DONOR RESTRICTIONS		
REVENUE AND GAINS/LOSSES		
Assessments revenue, net of refunds	\$ 9,241,652	\$ 8,851,079
Contract revenue	257,259	83,800
Other income	<u>73,832</u>	<u>28,684</u>
Total revenue and gains/losses9,572,7438,963,563
EXPENSES		
Program expenses:		
Research, development, and demonstration	1,928,697	1,869,509
Heating oil efficiency and upgrade	1,394,446	1,313,136
Consumer education, safety, and training	2,791,730	2,651,449
Unallocated state rebates	<u>1,942,501</u>	<u>1,818,717</u>
Total program expenses8,057,3747,652,811
Administrative costs231,756195,263
General and special projects:		
Assessment and collection costs	135,230	179,944
Annual report costs	<u>58,473</u>	<u>59,663</u>
Total general and special projects	<u>193,703</u>	<u>239,607</u>
Total expenses	<u>8,482,833</u>	<u>8,087,681</u>
CHANGE IN NET ASSETS WITHOUT DONOR RESTRICTIONS	1,089,910	875,882
NET ASSETS, BEGINNING OF YEAR	<u>5,158,428</u>	<u>4,282,546</u>
NET ASSETS, END OF YEAR	<u>\$ 6,248,338</u>	<u>\$ 5,158,428</u>

The accompanying notes are an integral part of these financial statements.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

STATEMENTS OF FUNCTIONAL EXPENSES
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	2018							
	PROGRAM SERVICES							
	Research, Development, and Demonstration	Heating Oil Efficiency and Upgrade	Consumer Education, Safety, and Training	Unallocated State Rebates	Total Program Services	Administrative Costs	General and Special Projects	Total 2018
Grants	\$ 713,907	\$ 1,326,723	\$ 2,463,485	\$ 1,942,501	\$ 6,446,616	\$ -	\$ -	\$ 6,446,616
Salaries, taxes, and benefits	388,799	56,854	67,656	-	513,309	59,661	36,037	609,007
Professional fees	727,318	4,738	249,398	-	981,454	151,383	153,089	1,285,926
Other expenses	98,673	6,131	11,191	-	115,995	20,712	4,577	141,284
TOTAL 2018 EXPENSES	<u>\$ 1,928,697</u>	<u>\$ 1,394,446</u>	<u>\$ 2,791,730</u>	<u>\$ 1,942,501</u>	<u>\$ 8,057,374</u>	<u>\$ 231,756</u>	<u>\$ 193,703</u>	<u>\$ 8,482,833</u>
	2017							
	PROGRAM SERVICES							
	Research, Development, and Demonstration	Heating Oil Efficiency and Upgrade	Consumer Education, Safety, and Training	Unallocated State Rebates	Total Program Services	Administrative Costs	General and Special Projects	Total 2017
Grants	\$ 563,659	\$ 1,248,355	\$ 2,369,317	\$ 1,818,717	\$ 6,000,048	\$ -	\$ -	\$ 6,000,048
Salaries, taxes, and benefits	335,166	35,994	54,021	-	425,181	79,182	45,173	549,536
Professional fees	783,147	25,755	216,764	-	1,025,666	97,737	140,036	1,263,439
Other expenses	187,537	3,032	11,347	-	201,916	18,344	54,398	274,658
TOTAL 2017 EXPENSES	<u>\$ 1,869,509</u>	<u>\$ 1,313,136</u>	<u>\$ 2,651,449</u>	<u>\$ 1,818,717</u>	<u>\$ 7,652,811</u>	<u>\$ 195,263</u>	<u>\$ 239,607</u>	<u>\$ 8,087,681</u>

The accompanying notes are an integral part of these financial statements.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

STATEMENTS OF CASH FLOWS
FOR THE YEARS ENDED DECEMBER 31, 2018 AND 2017

	<u>2018</u>	<u>2017</u>
CASH FLOWS FROM OPERATING ACTIVITIES		
Change in net assets	\$ 1,089,910	\$ 875,882
Adjustments to reconcile change in net assets to net change in cash from operating activities:		
Depreciation and amortization	31,121	31,064
Changes in assets and liabilities:		
Assessments receivable	(99,076)	(168,978)
Prepaid state assessments	79,390	(149,571)
Other assets	(65,563)	11,332
Accounts payable	(337,352)	385,975
Refunds payable	18,678	(74,006)
State grants payable	(304,546)	(712,752)
Obligation for unallocated state rebates	(627,018)	(315,060)
Other liabilities	<u>22,556</u>	<u>11,378</u>
Net change in cash from operating activities	<u>(191,900)</u>	<u>(104,736)</u>
NET CHANGE IN CASH	(191,900)	(104,736)
CASH, BEGINNING OF YEAR	<u>9,343,450</u>	<u>9,448,186</u>
CASH, END OF YEAR	<u>\$ 9,151,550</u>	<u>\$ 9,343,450</u>

NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2018 AND 2017

NOTE 1 - THE ORGANIZATION

The National Oilheat Research Alliance, Inc. (the Alliance) is a non-profit trade organization developed under the National Oilheat Research Alliance Act of 2000 (NORA), Public Law 106-469, legislation passed by the United States Congress and signed into law in November 2000. The law was amended in 2014 under NORA Public Law 113-79. The Alliance was created to educate consumers about the benefits of oilheat, to perform research and development, to encourage heating oil efficiency and upgrades, and to provide technical training to provide better customer service. The Alliance's Board consists of members from the oilheat industry, retail markets, wholesale distributors, public members, and representatives from the states with the highest oilheat sales. The Alliance was incorporated on January 31, 2001. Funding under the NORA Public Law 106-469 ceased on February 6, 2010. On February 7, 2014, the NORA Public Law 113-79 extended the provisions of NORA Public Law 106-469 to February 6, 2019. Funding under NORA Public Law 113-79 resumed effective April 1, 2014. On December 20, 2018, Public Law 115-334, *the Agriculture Improvement Act of 2018* (NORA Public Law 115-334) was signed. NORA Public Law 115-334 extended and modified the provisions of NORA Public Law 113-79 to February 6, 2029.

Pursuant to NORA Public Law 113-79, Congress established a limit on the use of assessments revenue of 30 percent for consumer education, safety, and training; a minimum of at least 30 percent of assessments revenue for research, development, and demonstration; a minimum of at least 15 percent of assessments revenue for heating oil efficiency and upgrade; and a limit on the use of assessments revenue of 5 percent for administrative costs. In the years ended December 31, 2018 and 2017, the Alliance was in compliance with these percentages. Beginning February 6, 2019, NORA Public Law 115-334 increased the limit on administrative costs to 7 percent of assessments revenue. Further, NORA Public Law 115-334 requires in each calendar year beginning February 6, 2019, the Alliance may not obligate an amount greater than the sum of (1) 75 percent of the amount of assessments estimated to be collected in the calendar year; (2) 75 percent of the amount of assessments actually collected in the most recent calendar year for which an audit report has been submitted less the amount estimated in (1) above; and (3) amounts permitted in preceding calendar years to be obligated that have been obligated. The assessments collected in excess of the amounts permitted to be obligated in (1), (2), and (3) above, shall be deposited in an escrow account and be unavailable for use until October 1, 2028, when it can be used consistent with the provisions of NORA Public Law 106-469.

NOTE 2 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting

The financial statements have been prepared on the accrual basis of accounting following the Financial Accounting Standards Board (FASB) Accounting Standards Codification (ASC), which is the sole source of authoritative accounting principles generally accepted in the United States of America (GAAP). The Alliance reports information regarding its financial position and activities according to two classes of net assets: with donor restrictions and without donor restrictions.

Accounting Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that could affect certain reported amounts of assets, liabilities, revenue, and expenses, the disclosure of contingent assets and liabilities at the date of the financial statements, and functional allocations during the year. Actual results could differ from those estimates.

Reclassifications

Certain 2017 amounts have been reclassified to conform with 2018 classifications.

NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2018 AND 2017

NOTE 2 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

Other Receivables and Contract Revenue

Other receivables consist of amounts due from research and development contracts. Contract revenue is recognized when services have been completed. Bad debts are recognized based on historical experience and an evaluation of outstanding receivables. Receivables are written off when all reasonable efforts for collection have been utilized. No allowance was deemed necessary by management at December 31, 2018 or 2017.

Assessments Revenue

The NORA Public Law 113-79 requires wholesale distributors of No. 1 distillate and No. 2 dyed distillate to remit an assessment of two-tenths of one cent per gallon at the point of sale to the Alliance. If the No. 1 distillate or No. 2 dyed distillate is imported after the point of sale, the assessment is to be made when the product enters the United States of America. Assessments are due to be remitted to the Alliance at least quarterly.

Under NORA Public Law 113-79's collections rules, any dyed distillate or blends are subject to assessment. Some of this fuel is used for non-heating applications and is refunded. Assessments revenue is presented in the accompanying statements of activities net of refunds recorded of \$1,444,746 and \$1,264,055 for the years ended December 31, 2018 and 2017, respectively.

Assessments Receivable

An estimate of assessments to be received, but not remitted to the Alliance as of year-end, is recognized. Receivables are charged to bad debt loss as they are deemed uncollectible based upon a periodic review of the accounts. As of December 31, 2018 and 2017, no allowance for uncollectible accounts was considered necessary by management.

Functional Allocation of Expenses

The cost of providing the various programs and other activities have been presented on a functional basis in the accompanying statements of activities. Accordingly, certain costs have been allocated among the programs and supporting services benefited based on estimates of time and effort of staff.

Income Tax Status

The Alliance received a determination letter from the Internal Revenue Service (IRS) that it has been granted an exemption from federal income taxes and it qualifies under Section 501(c)(6) of the Internal Revenue Code. The Alliance believes its operations are consistent with the nature of their exemption granted by the IRS. There is no current liability for income taxes on unrelated business income and no temporary differences resulting in deferred taxes as of December 31, 2018 and 2017.

The Alliance is required to measure, recognize, present, and disclose in its financial statements uncertain income tax positions the Alliance has taken in the tax years that remain subject to examination or expects to take on an income tax return. The Alliance recognizes the tax benefits from uncertain income tax positions only if it is more likely than not the tax position will be sustained on examination by tax authorities. The Alliance recorded no liability for uncertain income tax positions for any open tax years.

Subsequent Events

The Alliance has evaluated subsequent events through the report date, which is the date the financial statements were available to be issued.

NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2018 AND 2017

NOTE 3 - CONCENTRATIONS OF CREDIT RISK

The Alliance has exposure to credit risk on its cash and investments held in broker-managed accounts. The assets are insured by the Securities Investor Protection Corporation (SIPC), which protects investors for up to \$500,000 including a maximum of \$250,000 for claims of cash if the brokerage firm holding the assets becomes insolvent, but it does not insure the underlying assets of \$9,151,550 as of December 31, 2018. Management does not consider this a significant concentration of credit risk.

NOTE 4 - PROGRAM SERVICES

The NORA Public Law 113-79 places requirements on how the Alliance can spend the assessments it collects. At the beginning of each year, the Alliance makes an estimate of what total assessments are anticipated to be in the coming year. Grants are made to state organizations and national campaigns are undertaken based on the estimates. Actual assessments revenue differ from the estimates. The difference between the estimates and actual assessments are to be reflected in the grants made in future years. The law establishes strict percentage allocations for program spending and these percentages are tied to the revenue received from assessments. Management has developed procedures to ensure these percentages are reflected in budgets and carried forward as appropriate. Variances between the percentages disclosed in the program descriptions below are descriptive of the current year's operations and management believes they do not indicate non-compliance with the statute.

Research, Development, and Demonstration

The NORA Public Law 113-79 requires the Alliance to ensure not less than 30 percent of the assessments collected for each calendar year under the NORA Public Law 113-79 are used by qualified state associations or the Alliance to conduct research, development, and demonstration activities relating to oilheat fuel, including the development of energy-efficient heating systems to be placed into the marketplace. This also includes the Alliance, in conjunction with an institution or organization engaged in biofuels research, to develop consumer education materials describing the benefits of using biofuels as or in oilheat fuel based on the technical information developed.

In 2018, the Alliance granted or expended \$1,928,697 for the research, development, and demonstration program, including \$1,214,790 in grants and spending of past year's assessments revenue. The Alliance also budgeted \$2,100,000 in additional national spending from 2018 assessments revenue to be spent subsequent to year-end for the research, development, and demonstration program, making the total for 2018, 30 percent of net assessments revenue. Additionally, unallocated state rebates of 2018 assessments revenue will be used for the research, development, and demonstration program.

Heating Oil Efficiency and Upgrade

The NORA Public Law 113-79 requires the Alliance to ensure not less than 15 percent of the assessments collected for each calendar year under the NORA Public Law 113-79 are used by qualified state associations or the Alliance to carry out programs to assist consumers (i) to make cost-effective upgrades to more fuel efficient heating oil systems or otherwise make cost-effective modifications to an existing heating system to improve the efficiency of the system, (ii) to improve energy efficiency or reduce energy consumption through cost-effective energy efficiency programs for consumers, or (iii) to improve the safe operation of a heating system.

In 2018, the Alliance granted or expended \$1,394,446 for the heating oil efficiency and upgrade program, including \$67,723 in grants and spending of past year's assessments revenue. The Alliance also budgeted \$80,000 in additional national spending from 2018 assessments revenue to be spent subsequent to year-end for the heating oil efficiency and upgrade program, making the total for 2018, 15 percent of net assessments revenue. Additionally, unallocated state rebates of 2018 assessments revenue will be used for the heating oil efficiency and upgrade program.

NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2018 AND 2017

NOTE 4 - PROGRAM SERVICES (continued)Consumer Education, Safety, and Training

The NORA Public Law 113-79 requires the Alliance to ensure not more than 30 percent of the assessments collected for each calendar year under the NORA Public Law 113-79 are used (i) to conduct consumer education activities relating to oilheat fuel, including providing information to consumers on energy conservation strategies, safety, new technologies that reduce consumption or improve safety and comfort, the use of biofuel blends, and federal, state, and local programs designed to assist oilheat fuel consumers, (ii) to conduct worker safety and training activities relating to oilheat fuel, including energy efficiency training, (iii) to carry out other activities recommended by the Secretary of Energy, or (iv) to establish a data collection process to track equipment, service, and related safety issues to develop measures to improve safety.

In 2018, the Alliance granted or expended \$2,791,730 for the consumer education, safety, and training program, including \$30,691 in grants and spending of past year's assessments revenue. The Alliance also budgeted \$309,010 in additional national spending from 2018 assessments revenue for the consumer education, safety, and training program, of which \$11,457 remained unspent as of December 31, 2018, making the total for 2018, 30 percent of net assessments revenue.

Unallocated State Rebates

In addition to the specific program commitments discussed previously, the Alliance has committed \$1,942,501, which is 21 percent of net 2018 assessment revenue, for state rebates that have not yet been allocated to a program specified in the NORA Public Law 113-79. The Alliance plans to allocate these state rebates to the research, development, and demonstration and/or heating oil efficiency and upgrade programs. State organizations develop detailed plans for use of the rebates to do work under these programs. These funds will be allocated between programs in accordance with the requirements of NORA Public Law 113-79 as discussed previously.

NOTE 5 - ADMINISTRATIVE EXPENSE CAP

NORA Public Law 113-79 requires the Alliance to limit expenditures for "Administrative" costs to five percent of revenue generated by assessment remittances beginning April 1, 2014. In 2018, the Alliance expended \$231,756 for Administrative expenses, which was 3 percent of net assessments revenue in the year ended December 31, 2018. In 2017, the Alliance expended \$195,263 for Administrative expenses, which was 2 percent of net assessments revenue in the year ended December 31, 2017. Thus, management believes the Alliance is in compliance with this provision of NORA Public Law 113-79.

NOTE 6 - STATE GRANTS PAYABLE AND OBLIGATION FOR UNALLOCATED REBATES

Under NORA Public Law 113-79, the Alliance has entered into various agreements with state organizations, which may require periodic payment of grant funds. The outstanding grant liability by program is as follows as of December 31:

	<u>2018</u>	<u>2017</u>
Research, development, and demonstration	\$ 1,146,035	\$ 994,231
Heating oil efficiency and upgrade	874,895	1,247,501
Consumer education, safety, and training	1,063,614	1,147,358
Unallocated state rebates	<u>1,988,799</u>	<u>2,615,817</u>
Total state grants payable and obligations for unallocated rebates	<u>\$ 5,073,343</u>	<u>\$ 6,004,907</u>

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2018 AND 2017

NOTE 7 - COLLECTION COSTS

The Alliance has developed an audit system for collections compliance and has the legal authority to conduct audits to ensure member compliance. Collection costs include the costs incurred to process annual assessments, to publicize the collection system, and to ascertain compliance as stipulated by NORA Public Law 113-79. Assessment and collection costs were \$135,230 and \$179,944 for the years ended December 31, 2018 and 2017, respectively.

NOTE 8 - FINANCIAL ASSETS AND LIQUIDITY

Financial assets available within one year for operations that are not subject to restrictions that make them unavailable for general operations as of December 31, were as follows:

	<u>2018</u>	<u>2017</u>
Cash	\$ 9,151,550	\$ 9,343,450
Assessments receivable due within one year	3,086,323	2,987,247
Prepaid state assessments	137,970	217,360
Other current assets	74,509	9,986
Less: state grants payable	(3,084,544)	(3,389,090)
Less: obligation for unallocated state rebates	(1,988,799)	(2,615,817)
Less: designated net assets for national spending not yet incurred	<u>(5,549,631)</u>	<u>(4,671,378)</u>
Total financial assets available within one year for operations	<u>\$ 1,827,378</u>	<u>\$ 1,881,758</u>

The Alliance has a budgetary process to develop estimates and make grant payables to comply with NORA Public Law 113-79 and NORA Public Law 115-334. Liquid assets are maintained in cash accounts to minimize risk of loss.

NOTE 9 - NET ASSETS

Pre-2014 Reauthorization Designated Net Assets

As discussed previously, NORA Public Law 113-79 became effective April 1, 2014. The Alliance designated the remaining net assets under the former NORA Public Law 106-469 for use in a national oilheat education program. As of December 31, 2018 and 2017, \$55,933 remained unspent and are designated for future use.

State Grants and Rebates Made After Year-End Designated Net Assets

The Alliance establishes a budget for net assessments revenue and makes state grants and obligations for state rebates based on this budget. Actual results were not substantially different than this initial budget.

National Spending Not Yet Incurred Designated Net Assets

Included within the budget is \$5,549,631 and \$4,671,378 in national spending of assessments revenue, which had not yet been incurred as of December 31, 2018 and 2017, respectively. The Alliance has designated net assets in these amounts for future program spending, some of which, the Alliance has approved contracts to expend.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

NOTES TO FINANCIAL STATEMENTS
DECEMBER 31, 2018 AND 2017

NOTE 9 - NET ASSETS (continued)

Net Assets Available for Obligation - Other Than For Consumer Education, Safety, and Training

The amount reported as net assets without donor restrictions available for obligation - other than for consumer education, safety, and training are the net amounts available for future obligation for all purposes other than consumer education, safety, and training, since NORA Public Law 113-79 has placed limits on the use of assessments revenue from consumer education, safety, and training.

NOTE 10 - COMMITMENTS AND CONTINGENCIES

The Alliance has entered into operating lease agreements for office space and a liquid fuels research center. Total rent expense under these leases was \$95,413 and \$99,795 for the years ended December 31, 2018 and 2017, respectively. Subsequent to December 31, 2018, the Alliance extended this lease through December 31, 2025. Future minimum lease payments are as follows for the years ending December 31:

2019	\$	82,121
2020		84,584
2021		100,998
2022		104,028
2023		107,149
2024		110,364
2025		<u>113,674</u>
Total future minimum lease payments	\$	<u>702,918</u>

From time to time, the Alliance may receive inquiries from government agencies, because of the nature of its funding sources. Management does not expect the result of such inquiries to impact the financial information of the Alliance.

NOTE 11 - RETROSPECTIVE IMPLEMENTATION OF NEW STANDARD

In the year ended December 31, 2018, the Alliance retrospectively implemented Accounting Standards Update (ASU) No. 2016-14, *Not-for-Profit Entities (Topic 958): Presentation of Financial Statements of Not-for-Profit Entities*. This standard is intended to improve the net asset classification and the information presented in the financial statements and notes about a not-for-profit organization's liquidity, financial performance, net assets, cash flows, and expenses. As a result of this implementation, the Alliance renamed unrestricted net assets to net assets without donor restrictions.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

SUPPLEMENTAL SCHEDULE OF EXPENSES BY STATE/JURISDICTION -
RESEARCH, DEVELOPMENT, AND DEMONSTRATION
FOR THE YEAR ENDED DECEMBER 31, 2018

	Amounts Granted/ Expended in 2018	2018 State Grants Made After Year-End	2018 National Spending Not Yet Incurred	Total
STATE GRANTS-				
Connecticut	\$ 87,827	\$ -	\$ -	\$ 87,827
Delaware	4,460	-	-	4,460
Idaho	346	-	-	346
Indiana	906	-	-	906
Kentucky	9,950	-	-	9,950
Maine	48,714	-	-	48,714
Maryland	22,792	-	-	22,792
Massachusetts	90,540	-	-	90,540
Michigan	15,209	-	-	15,209
Nevada	187	-	-	187
New Hampshire	31,904	-	-	31,904
New Jersey	41,204	-	-	41,204
New York -				
NYOHA	41,755	-	-	41,755
UNYEA	32,780	-	-	32,780
HVOEC	19,252	-	-	19,252
OHILI	36,292	-	-	36,292
North Carolina	24,037	-	-	24,037
Ohio	19,151	-	-	19,151
Pennsylvania	95,746	-	-	95,746
Rhode Island	19,350	-	-	19,350
South Carolina	10,045	-	-	10,045
Virginia	22,381	-	-	22,381
Vermont	18,815	-	-	18,815
Washington	3,499	-	-	3,499
Washington, D.C.	227	-	-	227
Wisconsin	16,537	-	-	16,537
NATIONAL	<u>1,214,791</u>	<u>-</u>	<u>2,100,000</u>	<u>3,314,791</u>
TOTAL STATE GRANTS AND NATIONAL SPENDING	<u>\$ 1,928,697</u>	<u>\$ -</u>	<u>\$ 2,100,000</u>	<u>\$ 4,028,697</u>

In addition to these amounts, the unallocated state rebates detailed in the accompanying supplemental schedule of expenses by state/jurisdiction - unallocated state rebates will be used for either this program or for the heating oil efficiency and upgrade program.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

SUPPLEMENTAL SCHEDULE OF EXPENSES BY STATE/JURISDICTION -
HEATING OIL EFFICIENCY AND UPGRADE
FOR THE YEAR ENDED DECEMBER 31, 2018

	Amounts Granted/ Expended in 2018	2018 State Grants Made After Year-End	2018 National Spending Not Yet Incurred	Total
STATE GRANTS-				
Connecticut	\$ 163,218	\$ -	\$ -	\$ 163,218
Delaware	8,289	-	-	8,289
Idaho	643	-	-	643
Indiana	1,684	-	-	1,684
Kentucky	18,491	-	-	18,491
Maine	90,529	-	-	90,529
Maryland	42,356	-	-	42,356
Massachusetts	168,259	-	-	168,259
Michigan	28,265	-	-	28,265
Nevada	348	-	-	348
New Hampshire	59,291	-	-	59,291
New Jersey	76,573	-	-	76,573
New York -				
NYOHA	77,598	-	-	77,598
UNYEA	60,918	-	-	60,918
HVOEC	35,777	-	-	35,777
OHILI	67,445	-	-	67,445
North Carolina	44,670	-	-	44,670
Ohio	35,590	-	-	35,590
Pennsylvania	177,934	-	-	177,934
Rhode Island	35,960	-	-	35,960
South Carolina	18,668	-	-	18,668
Virginia	41,593	-	-	41,593
Vermont	34,966	-	-	34,966
Washington	6,503	-	-	6,503
Washington, D.C.	421	-	-	421
Wisconsin	30,733	-	-	30,733
NATIONAL	<u>67,724</u>	<u>-</u>	<u>80,000</u>	<u>147,724</u>
TOTAL STATE GRANTS AND NATIONAL SPENDING	<u>\$ 1,394,446</u>	<u>\$ -</u>	<u>\$ 80,000</u>	<u>\$ 1,474,446</u>

In addition to these amounts, the unallocated state rebates detailed in the accompanying supplemental schedule of expenses by state/jurisdiction - unallocated state rebates will be used for either this program or for the research, development, and demonstration program.

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

SUPPLEMENTAL SCHEDULE OF EXPENSES BY STATE/JURISDICTION -
CONSUMER EDUCATION, SAFETY, AND TRAINING
FOR THE YEAR ENDED DECEMBER 31, 2018

	Amounts Granted/ Expended in 2018	2018 State Grants Made After Year-End	2018 National Spending Not Yet Incurred	Total
STATE GRANTS-				
Connecticut	\$ 303,066	\$ -	\$ -	\$ 303,066
Delaware	15,392	-	-	15,392
Idaho	1,194	-	-	1,194
Indiana	3,128	-	-	3,128
Kentucky	34,335	-	-	34,335
Maine	168,096	-	-	168,096
Maryland	78,648	-	-	78,648
Massachusetts	312,428	-	-	312,428
Michigan	52,483	-	-	52,483
Nevada	647	-	-	647
New Hampshire	110,093	-	-	110,093
New Jersey	142,182	-	-	142,182
New York -				
NYOHA	144,084	-	-	144,084
UNYEA	113,113	-	-	113,113
HVOEC	66,431	-	-	66,431
OHILI	125,232	-	-	125,232
North Carolina	82,945	-	-	82,945
Ohio	66,085	-	-	66,085
Pennsylvania	330,392	-	-	330,392
Rhode Island	66,772	-	-	66,772
South Carolina	34,663	-	-	34,663
Virginia	77,230	-	-	77,230
Vermont	64,926	-	-	64,926
Washington	12,074	-	-	12,074
Washington, D.C.	782	-	-	782
Wisconsin	57,066	-	-	57,066
NATIONAL	<u>328,243</u>	<u>-</u>	<u>11,457</u>	<u>339,700</u>
TOTAL STATE GRANTS AND NATIONAL SPENDING	<u>\$ 2,791,730</u>	<u>\$ -</u>	<u>\$ 11,457</u>	<u>\$ 2,803,187</u>

NATIONAL OILHEAT RESEARCH ALLIANCE, INC.

SUPPLEMENTAL SCHEDULE OF EXPENSES BY STATE/JURISDICTION -
UNALLOCATED STATE REBATES
FOR THE YEAR ENDED DECEMBER 31, 2018

	Amounts Granted/ Expended in 2018	2018 State Rebates After Year-End	2018 National Spending Not Yet Incurred	Total
UNALLOCATED STATE REBATES-				
Connecticut	\$ 238,972	\$ -	\$ -	\$ 238,972
Delaware	12,137	-	-	12,137
Idaho	942	-	-	942
Indiana	2,466	-	-	2,466
Kentucky	27,074	-	-	27,074
Maine	132,547	-	-	132,547
Maryland	62,015	-	-	62,015
Massachusetts	246,355	-	-	246,355
Michigan	41,383	-	-	41,383
Nevada	510	-	-	510
New Hampshire	86,810	-	-	86,810
New Jersey	112,113	-	-	112,113
New York -				
NYOHA	113,613	-	-	113,613
UNYEA	89,192	-	-	89,192
HVOEC	52,382	-	-	52,382
OHILI	98,748	-	-	98,748
North Carolina	65,404	-	-	65,404
Ohio	52,109	-	-	52,109
Pennsylvania	260,519	-	-	260,519
Rhode Island	52,651	-	-	52,651
South Carolina	27,332	-	-	27,332
Virginia	60,897	-	-	60,897
Vermont	51,195	-	-	51,195
Washington	9,521	-	-	9,521
Washington, D.C.	617	-	-	617
Wisconsin	44,997	-	-	44,997
TOTAL UNALLOCATED STATE REBATES	<u>\$ 1,942,501</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 1,942,501</u>

These unallocated state rebates will be allocated to either the research, development, and demonstration or the heating oil efficiency and upgrade programs based on detailed plans for use of the rebates to be submitted by the states.

National Oilheat Research Alliance
Statement of Activities
For the Twelve Months Ending December 31, 2018

	December 2018	YTD 2018	2018 Budget	Remaining	YTD 2017
INCOME					
<i>Collections and Assessments</i>					
Collections	\$3,241,067.89	\$10,686,398.34	\$9,378,717.27	(\$1,307,681.07)	\$10,115,134.42
Remittance Accrual	0.00	0.00	0.00	0.00	0.00
Refunds	(410,993.01)	(1,444,746.43)	0.00	1,444,746.43	(1,264,055.15)
Collection Costs	(8,800.91)	(88,592.75)	(115,000.00)	(26,407.25)	(90,849.04)
Net Collections	2,821,273.97	9,153,059.16	9,263,717.27	110,658.11	8,760,230.23
<i>In Kind Contributions</i>					
Sales Revenue	962.24	6,462.28	0.00	(6,462.28)	6,359.22
Other Revenue (Grants, etc)	77,278.54	260,247.75	0.00	(260,247.75)	83,790.00
Total Income	2,899,514.75	9,419,769.19	9,263,717.27	(156,051.92)	8,850,379.45
PROGRAM EXPENSES					
<i>Consumer Education and Training (Max. 30%)</i>	36,321.74	2,802,330.67	2,813,485.28	11,154.61	2,665,042.22
Education and Training (Central)	40,630.60	338,845.39	350,000.00	11,154.61	295,725.21
Education and Training (States)	(4,308.86)	2,463,485.28	2,463,485.28	0.00	2,369,317.01
<i>Research Development and Demonstration (Min. 30%)</i>	78,801.41	1,883,572.91	2,813,907.40	930,334.49	1,909,903.80
Research Development and Demonstration (Central)	78,971.88	1,169,665.51	2,100,000.00	930,334.49	1,346,244.93
Research Development and Demonstration (States)	(170.47)	713,907.40	713,907.40	0.00	563,658.87
<i>Home Energy Efficiency Program (Min. 15%)</i>	10,200.34	1,406,459.93	1,406,722.63	262.70	1,331,226.38
Home Energy Efficiency Program (Central)	10,517.14	79,737.30	80,000.00	262.70	82,871.33
Home Energy Efficiency Program (States)	(316.80)	1,326,722.63	1,326,722.63	0.00	1,248,355.05
Total Central	130,119.62	1,588,248.20	2,530,000.00	941,751.80	1,724,841.47
Total States	(4,796.13)	4,504,115.31	4,504,115.31	0.00	4,181,330.93
State Rebates	(81,467.92)	1,942,500.79	1,942,500.79	0.00	1,818,717.03
Old Grant Advertising	0.00	0.00	0.00	0.00	0.00
<i>Office Unallocated Expenses</i>					
Salaries and Consulting (Admin)	(21,370.61)	117,874.86	75,000.00	(42,874.86)	121,768.10
Accounting (Admin)	2,796.31	31,360.42	50,000.00	18,639.58	28,862.77
Insurance (Admin)	1,154.85	12,479.22	15,000.00	2,520.78	18,272.98
Taxes	(38.48)	2,539.81	3,000.00	460.19	3,568.09
Postage	1,127.76	1,210.00	3,000.00	1,790.00	144.39
Web Pages	1,482.61	15,972.26	30,000.00	14,027.74	14,919.38
Annual Report	5,999.55	51,415.63	45,000.00	(6,415.63)	52,753.96
Rent and Telephone	1,458.78	17,271.29	22,000.00	4,728.71	15,381.46
Travel	624.86	624.86	1,000.00	375.14	0.00
Meeting Expenses	0.00	0.00	8,000.00	8,000.00	83.64
Office Supplies	7.95	1,258.23	2,000.00	741.77	2,457.55
Dues & Memberships	0.00	200.00	100.00	(100.00)	94.99
Bank Fees	553.62	5,879.41	6,000.00	120.59	5,332.84
Legal Expense	96,000.00	96,000.00	15,000.00	(81,000.00)	0.00
Professional Fees	481.25	5,290.25	3,000.00	(2,290.25)	3,576.00
Misc Expense	0.00	0.00	1,000.00	1,000.00	0.00
Advertising Expense	0.00	0.00	1,000.00	1,000.00	0.00
Fixed Assets <\$1,000	0.00	0.00	1,000.00	1,000.00	0.00
Equipment Maintenance	0.00	0.00	5,000.00	5,000.00	4,726.25
Bad Debts	0.00	0.00	1,000.00	1,000.00	0.00
Total Unallocated Expenses	90,278.45	359,376.24	287,100.00	(72,276.24)	271,942.40
<i>Other Expenses/(Income)</i>					
Cost of Goods Sold	540.83	4,908.10	0.00	(4,908.10)	5,462.28
Interest Expense	0.00	0.00	1,000.00	1,000.00	0.00
Interest	(6,182.81)	(69,289.51)	(1,000.00)	68,289.51	(27,797.10)
Total Other Expenses/(Income)	(5,641.98)	(64,381.41)	0.00	64,381.41	(22,334.82)
Net Revenue/(Expense)	2,771,022.71	1,089,910.06	1.17	(1,089,908.89)	875,882.44

Restricted for Management's Use Only
See Accountants' Compilation Report

National Oilheat Research Alliance
Statement of Financial Position
December 31, 2018

	2018	2017
ASSETS		
CURRENT ASSETS:		
Cash and Cash Equivalents	\$9,151,549.73	\$9,343,699.72
Accounts Receivable	65,237.87	1,402.90
Assessments and Other Receivables	3,086,323.40	2,987,247.06
Security Deposit	21,146.10	21,146.10
Prepaid Assets	147,240.93	225,943.70
Total Current Assets	12,471,498.03	12,579,439.48
PROPERTY AND EQUIPMENT		
Office Furniture and Equipment	66,849.15	73,847.15
Website	45,450.00	45,450.00
Computer Equipment	3,819.34	7,757.64
Less: Accumulated Depreciation	(60,581.34)	(50,526.92)
Less: Accumulative Amortization (Web Site)	(38,559.99)	(29,469.99)
Total Property and Equipment	16,977.16	47,057.88
TOTAL ASSETS	\$12,488,475.19	\$12,626,497.36
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES:		
State Rebate Obligations 2014	37,652.73	61,166.00
State Rebate Obligations 2015	295,920.21	438,220.91
State Rebate Obligations 2016	392,349.58	1,666,251.07
State Rebate Obligations 2017	981,961.92	3,839,269.00
State Rebate Obligations 2018	3,365,458.40	0.00
Total Grants Payable	5,073,342.84	6,004,906.98
Accrued Salaries & Benefits	57,797.86	34,058.91
Reserve for BIO Diesel Testing	764.35	764.35
Accounts Payable	1,029,541.00	1,365,253.11
Contracts Payable	3,143.00	41,903.00
Accrued Expenses	75,545.52	21,180.45
Total Current Liabilities	\$6,240,134.57	\$7,468,066.80
NET ASSETS:		
Unrestricted Net Assets	642,776.35	431,119.38
Pre-2014 Reauthorization Net Assets	55,933.05	55,933.05
National Spending Not Yet Incurred		
Research, Development, and Demonstration - net yet obligated	5,098,554.00	3,779,596.02
Research, Development, and Demonstration - obligated under contract	316,580.00	750,328.00
Heating Oil Efficiency and Upgrade - net yet obligated	123,039.95	110,763.29
Consumer Education, Safety, and Training - net yet obligated	11,457.27	30,690.82
Net Income (Loss)		
Total Net Assets	6,248,340.62	5,158,430.56
TOTAL LIABILITIES AND NET ASSETS	\$12,488,475.19	\$12,626,497.36

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Proposed Resolution

By law, NORA can spend no more than 30 percent of its collections on education and training/consumer education. In 2018, the budget called for consumer education spending of \$2,813,485. However, the actual collection revenues for the year were \$9,241,652. As a result, the maximum amount that could be spent was \$2,772,495. To ensure state funds which in many cases have been expended are not affected, the shortfall or overspending will be addressed at the central level. This shortfall is \$40,990.

To address this shortfall.

RESOLVED: That the 2018 budget for consumer education and training be reduced to \$2,772,495.57.

BE IF FURTHER RESOLVED: That the excess funds from 2017 of \$30,690.82 be used for central education and training expenses incurred in 2018.

Resolution on Audit

The draft Audit has been submitted to this Board. The numbers generated match the internal financial statements.

Be it Resolved: That the Board accepts the Treasurer's report, the draft audit and the year end financials.

Be it further Resolved; That the audit be finalized and serve as the 2018 annual report.

National Oilheat Research Alliance
Statement of Activities
For the Three Months Ending March 31, 2019

	March 2019	YTD 2019	2019 Budget	Remaining	YTD 2018
INCOME					
Collections and Assessments					
Collections	\$341,236.23	\$523,641.19	\$7,446,757.00	\$6,923,115.81	\$441,813.38
Remittance Accrual	0.00	0.00	0.00	0.00	0.00
Refunds	(71,631.76)	(52,844.14)	0.00	52,844.14	(97,317.31)
Collection Costs	(8,081.34)	(23,335.32)	(100,000.00)	(76,664.68)	(22,445.15)
Net Collections	261,523.13	447,461.73	7,346,757.00	6,899,295.27	322,050.92
In Kind Contributions					
Sales Revenue	0.00	0.00	0.00	0.00	450.16
Other Revenue (Grants, etc)	(15,900.00)	0.00	0.00	0.00	500.00
Total Income	245,623.13	447,461.73	7,346,757.00	6,899,295.27	323,001.08
PROGRAM EXPENSES					
Consumer Education and Training (Max. 30%)					
Education and Training (Central)	22,007.71	1,880,055.79	2,107,333.56	227,277.77	2,521,907.46
Education and Training (States)	0.00	1,837,333.56	1,837,333.56	0.00	2,464,073.46
Research Development and Demonstration (Min. 30%)					
Research Development and Demonstration (Central)	77,729.87	792,092.80	2,204,025.67	1,411,932.87	923,161.30
Research Development and Demonstration (States)	0.00	238,067.13	1,650,000.00	1,411,932.87	209,083.43
Home Energy Efficiency Program (Min. 15%)					
Home Energy Efficiency Program (Central)	6,281.56	1,043,222.47	1,102,010.92	58,788.45	1,346,917.46
Home Energy Efficiency Program (States)	0.00	16,211.55	75,000.00	58,788.45	19,878.03
Total Central	106,019.14	297,000.91	1,995,000.00	1,697,999.09	286,795.46
Total States	0.00	3,418,370.15	3,418,370.15	0.00	4,505,190.76
State Rebates	0.00	1,618,084.99	1,618,085.09	0.10	2,023,968.71
Old Grant Advertising	0.00	0.00	0.00	0.00	0.00
Office Unallocated Expenses					
Salaries and Consulting (Admin)	8,049.57	20,517.61	100,000.00	79,482.39	24,523.57
Accounting (Admin)	220.16	5,626.38	30,000.00	24,373.62	7,572.37
Insurance (Admin)	1,418.99	3,992.84	18,000.00	14,007.16	2,766.81
Taxes	215.73	666.04	3,000.00	2,333.96	795.49
Postage	0.00	0.00	500.00	500.00	39.95
Web Pages	1,482.61	8,962.82	30,000.00	21,037.18	2,441.10
Annual Report	590.00	5,003.27	45,000.00	39,996.73	7,827.26
Rent and Telephone	1,738.77	5,015.76	24,000.00	18,984.24	4,262.53
Travel	696.44	696.44	1,000.00	303.56	0.00
Meeting Expenses	0.00	0.00	2,000.00	2,000.00	0.00
Office Supplies	830.97	830.97	2,000.00	1,169.03	48.75
Dues & Memberships	0.00	139.98	100.00	(39.98)	0.00
Bank Fees	757.13	1,606.94	6,000.00	4,393.06	2,155.55
Legal Expense	3,200.00	3,200.00	5,000.00	1,800.00	0.00
Professional Fees	0.00	0.00	3,000.00	3,000.00	1,031.25
Misc Expense	0.00	0.00	1,000.00	1,000.00	0.00
Advertising Expense	0.00	0.00	1,000.00	1,000.00	0.00
Fixed Assets <\$1,000	0.00	0.00	1,000.00	1,000.00	0.00
Equipment Maintenance	0.00	0.00	5,000.00	5,000.00	0.00
Bad Debts	0.00	0.00	1,000.00	1,000.00	0.00
Total Unallocated Expenses	19,200.37	56,259.05	278,600.00	222,340.95	53,464.63
Other Expenses/(Income)					
Cost of Goods Sold	295.83	3,134.26	0.00	(3,134.26)	977.49
Interest Expense	0.00	0.00	0.00	0.00	0.00
Interest	(6,489.25)	(16,531.09)	(60,000.00)	(43,468.91)	(10,428.37)
Total Other Expenses/(Income)	(6,193.42)	(13,396.83)	(60,000.00)	(46,603.17)	(9,450.88)
Net Revenue/(Expense)	126,597.04	(4,928,856.54)	96,701.76	5,025,558.30	(6,536,967.60)

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National Oilheat Research Alliance
Statement of Financial Position
March 31, 2019

	2019	2018
ASSETS		
CURRENT ASSETS:		
Cash and Cash Equivalents	\$10,532,847.33	\$9,852,504.79
Accounts Receivable	49,637.87	476.68
Assessments and Other Receivables	130,660.10	103,852.69
Security Deposit	21,146.10	21,146.10
Prepaid Assets	3,684.83	15,206.84
Total Current Assets	10,737,976.23	9,993,187.10
PROPERTY AND EQUIPMENT		
Office Furniture and Equipment	66,849.15	66,849.15
Website	45,450.00	45,450.00
Computer Equipment	3,819.34	2,778.64
Less: Accumulated Depreciation	(65,117.55)	(44,043.31)
Less: Accumulative Amortization (Web Site)	(40,832.49)	(31,742.49)
Total Property and Equipment	10,168.45	39,291.99
TOTAL ASSETS	\$10,748,144.68	\$10,032,479.09
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES:		
State Rebate Obligations 2014	20,122.04	60,544.23
State Rebate Obligations 2015	229,303.72	401,658.10
State Rebate Obligations 2016	376,315.50	1,306,454.42
State Rebate Obligations 2017	849,941.31	3,401,784.21
State Rebate Obligations 2018	3,157,928.07	6,104,367.83
State Rebate Obligations 2019	4,734,152.24	0.00
Total Grants Payable	9,367,762.88	11,274,808.79
Accrued Salaries & Benefits	28,180.25	19,464.61
Reserve for BIO Diesel Testing	764.35	764.35
Accounts Payable	67,919.69	45,178.75
Contracts Payable	(44,686.00)	41,903.00
Accrued Expenses	8,719.43	28,896.63
Total Current Liabilities	\$9,428,660.60	\$11,411,016.13
NET ASSETS:		
Unrestricted Net Assets	(5,999,275.52)	(8,848,593.93)
Pre-2014 Reauthorization Net Assets	55,933.05	55,933.05
National Spending Not Yet Incurred		
Research, Development, and Demonstration - net yet obligated	6,506,214.11	5,750,416.00
Research, Development, and Demonstration - obligated under contract	336,049.00	1,137,425.50
Heating Oil Efficiency and Upgrade - net yet obligated	181,828.40	185,171.79
Consumer Education, Safety, and Training - net yet obligated	238,735.04	341,110.55
Total Net Assets	1,319,484.08	(1,378,537.04)
TOTAL LIABILITIES AND NET ASSETS	\$10,748,144.68	\$10,032,479.09

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National Oilheat Research Alliance
Statement of Activities
For the Twelve Months Ending December 31, 2018

	December 2018	YTD 2018	2018 Budget	Remaining	YTD 2017	2019	2020	2021
INCOME								
Collections and Assessments								
Collections	\$3,049,596.50	\$10,494,926.95	\$9,378,717.27	(\$1,116,209.68)	\$10,115,134.42	\$9,187,650.00	\$ 8,912,020.50	\$ 8,644,659.89
Remittance Accrual	0.00	0.00	0.00	0.00	0.00			
Refunds	(300,688.16)	(1,334,441.58)	0.00	1,334,441.58	(1,264,055.15)			
Escrow						\$ 2,228,005.13	\$ -	\$ 2,161,164.97
Collection Costs	(11,185.86)	(90,977.70)	(115,000.00)	(24,022.30)	(90,849.04)	\$ (90,000.00)		\$ (90,000.00)
Net Collections	2,737,722.48	9,069,507.67	9,263,717.27	194,209.60	8,760,230.23	Available to spend	\$ 6,594,015.38	\$ 6,393,494.91
In Kind Contributions								
Sales Revenue	0.00	5,500.04	0.00	(5,500.04)	6,359.22			
Other Revenue (Grants, etc)	0.00	182,969.21	0.00	(182,969.21)	83,790.00	\$ 100,000.00		\$ 100,000.00
Total Income	2,737,722.48	9,257,976.92	9,263,717.27	5,740.35	8,850,379.45	\$ 6,694,015.38		\$ 6,493,494.91
PROGRAM EXPENSES								
Consumer Education and Training (Max. 30%)	37,270.93	2,803,279.86	2,813,485.28	10,205.42	2,665,042.22	\$ 2,008,204.61	\$ -	\$ 1,918,048.47
Education and Training (Central)	41,579.79	339,794.58	350,000.00	10,205.42	295,725.21	\$ 280,000.00		\$ 280,000.00
Education and Training (States)	(4,308.86)	2,463,485.28	2,463,485.28	0.00	2,369,317.01	\$ 1,728,204.61		\$ 1,638,048.47
Research Development and Demonstration (Min. 30%)	152,109.01	1,956,880.51	2,813,907.40	857,026.89	1,909,903.80	\$ 2,078,204.61		\$ 2,018,048.47
Research Development and Demonstration (Central)	152,279.48	1,242,973.11	2,100,000.00	857,026.89	1,346,244.93	\$ 1,300,000.00		\$ 1,300,000.00
Research Development and Demonstration (States)	(170.47)	713,907.40	713,907.40	0.00	563,658.87	\$ 778,204.61		\$ 718,048.47
Home Energy Efficiency Program (Min. 15%)	12,730.54	1,408,990.13	1,406,722.63	(2,267.50)	1,331,226.38	\$ 989,102.31		\$ 959,024.24
Home Energy Efficiency Program (Central)	12,747.34	81,967.50	80,000.00	(1,967.50)	82,871.33			
Home Energy Efficiency Program (States)	(16.80)	1,327,022.63	1,326,722.63	(300.00)	1,248,355.05			
Total Program Expenses	206,606.61	1,664,735.19	2,530,000.00	865,264.81	1,724,841.47	\$ 5,075,511.53		\$ 4,895,121.19
Total States	(4,496.13)	4,504,415.31	4,504,115.31	(300.00)	4,181,330.93			
State Rebates	(463.28)	2,023,505.43	1,942,500.79	(81,004.64)	1,818,717.03	\$ 1,352,003.84	\$ -	\$ 1,322,078.73
Old Grant Advertising	0.00	0.00	0.00	0.00	0.00			
Office Unallocated Expenses								
Salaries and Consulting (Admin)	30,689.68	169,935.15	75,000.00	(94,935.15)	121,768.10	\$ 165,000.00		\$ 169,950.00
Accounting (Admin)	2,796.31	31,360.42	50,000.00	18,639.58	28,862.77	\$ 35,000.00		\$ 36,050.00
Insurance (Admin)	1,154.85	12,479.22	15,000.00	2,520.78	18,272.98	\$ 15,000.00		\$ 15,450.00
Taxes	277.15	2,855.44	3,000.00	144.56	3,568.09	\$ 3,000.00		\$ 3,090.00
Postage	1,127.76	1,210.00	3,000.00	1,790.00	144.39	\$ 1,500.00		\$ 1,545.00
Web Pages	1,482.61	15,972.26	30,000.00	14,027.74	14,919.38	\$ 15,000.00		\$ 15,450.00
Annual Report	3,397.02	48,813.10	45,000.00	(3,813.10)	52,753.96	\$ 45,000.00		\$ 46,350.00
Rent and Telephone	1,458.78	17,271.29	22,000.00	4,728.71	15,381.46	\$ 20,000.00		\$ 20,600.00
Travel	624.86	624.86	1,000.00	375.14	0.00	\$ 1,000.00		\$ 1,030.00
Meeting Expenses	0.00	0.00	8,000.00	8,000.00	83.64	\$ 3,000.00		\$ 3,090.00
Office Supplies	7.95	1,258.23	2,000.00	741.77	2,457.55	\$ 1,000.00		\$ 1,030.00
Dues & Memberships	0.00	200.00	100.00	(100.00)	94.99	\$ 1,000.00		\$ 1,030.00
Bank Fees	553.62	5,879.41	6,000.00	120.59	5,332.84	\$ 6,000.00		\$ 6,180.00
Legal Expense	0.00	0.00	15,000.00	15,000.00	0.00	\$ 10,000.00		\$ 10,300.00
Equipment Consulting	481.25	5,290.25	3,000.00	(2,290.25)	3,576.00	\$ 5,000.00		\$ 5,150.00
Misc Expense	0.00	0.00	1,000.00	1,000.00	0.00			

Advertising Expense	0.00	0.00	1,000.00	1,000.00	0.00		
Fixed Assets <\$1,000	0.00	0.00	1,000.00	1,000.00	0.00		
Equipment Maintenance	0.00	0.00	5,000.00	5,000.00	4,726.25		
Bad Debts	0.00	0.00	1,000.00	1,000.00	0.00		
Total Unallocated Expenses (7 Percent Cap)	44,051.84	313,149.63	287,100.00	(26,049.63)	271,942.40	\$ 326,500.00	\$ 336,295.00
Other Expenses/(Income)							
Cost of Goods Sold	540.83	4,908.10	0.00	(4,908.10)	5,462.28		
Interest Expense	0.00	0.00	1,000.00	1,000.00	0.00		
Interest	(6,182.81)	(69,289.51)	(1,000.00)	68,289.51	(27,797.10)	\$ 60,000.00	\$ 60,000.00
Total Other Expenses/(Income)	(5,641.98)	(64,381.41)	0.00	64,381.41	(22,334.82)	\$ (60,000.00)	
Net Revenue/(Expense)	2,497,665.42	816,552.77	1.17	(816,551.60)	875,882.44		\$ -

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Proposed Resolution

NORA is required to provide biennial budgets. These budgets require public notice and submission to governmental authorities.

Resolved: That the proposed budget for 2020 and 2021 is acceptable for the first step in the process. That NORA work to finish the budget and have a final budget including state allocations available for the fall meeting.

Report on NORA Internal R&D
NORA Board of Directors
May 21, 2019

T. Butcher

Tankless Coil Boiler Project with NYSERDA

- Project Final Report Submitted to NYSERDA and Accepted
- We need to publish a paper on this work
 - Plan for ASHRAE Conference Paper
 - Abstract Due July

Air Source Heat Pump Field Study with NYSERDA

- Study of why and how these heat pumps are being installed and how they are controlled
- Best practices guide to be developed
- Six sites to included in New York
- Five sites were monitored last heating season
- Planning to add one additional plus more sites in New England
- All field monitoring is now completed, analysis in progress
- Key findings to date:
 - Heat pumps often installed to solve a local problem
 - Control of operation of both boiler and heat pump informally implemented

Fuel-Fired Heat Pump (SMTI)

- Work on integrating Babington burner with SMTI Heat Pump ongoing;
- Proposal submitted to NYSERDA on biofuel-fired heat pump selected for funding;
 - First task is a commercialization plan – now in progress
 - Focus is very high blends of EL and Biodiesel in petroleum oil – very high CO₂ impact

Field Study of Ethyl Levulinate

- Field test with 11 homes in Maine at 10% blend level successfully completed;
- Strong support from the NORA lab;
- Focus this year has been on EL 100 test at single University of Maine site;
- Failure of elastomers have been significant problem;
- We have identified elastomers which are compatible and currently working to switch all materials in one pump for continued testing.
 - Nitrile, Viton, Teflon-encapsulated-Viton not acceptable
 - Teflon and silicon materials acceptable.
- A review of the system-wide implications of the use of this fuel being reviewed;
- Plan to restart tests in Maine when pump elastomers have been changed;
- Combustion tests of EL have been done in the NORA lab.

Practical Impact of Copper on Fuels

- NORA has completed a great deal of work on this topic;
- Publication with REG on this work prepared for submission to a Journal;
- Most recent work has focused on understanding the summer shut-down question;
- In long term tests (25 weeks) , no significant degradation of fuel in an idle line have been found but we have found insoluble gums on the copper line walls.
- Note – we are adding an FTIR analyzer to help with fuel characterization

Planni Ap

Ability to go to 100% biofuel (LCLF*)	4.7
Develop <i>Biofuel Roadmap</i> with time lines and matrix of current status by blends	4.6
Continue fuel quality research & solutions	4.5
Recommended practices guide for biofuel blends	4.3
Outdoor biofuel storage operability study	4.2
Better communicate oilheating advances (ULSHO**, biodiesel, etc)	4.2
Demonstrate LCLF* appliances as better solution than electric (carbon reduction, grid relief)	4.0
Wholesale/terminal upstream blending of biofuels	4.0
Re-brand away from "fossil fuel oil"/end to slandering of biofuels	3.9
Smart heating appliances (connectivity, self-diagnosis and adjustment)	3.9
Full cost analysis of implications of electricity VS. LCLF*	3.8
Integrated LCLF* systems to integrate with heat pumps	3.7
Offer as many heating technologies as possible, including LCLF* heat pumps focusing on efficiency and zero net carbon	3.6
Off-grid ignition of heating system (in absence of power using batteries, generators, etc.)	3.3
Easy switch-over from electric to LCLF* backup appliance	3.1

*Low Carbon Liquid Fuel: combination of zero-carbon biofuels (biodiesel, renewable diesel, etc.) blended with petroleum oil or used in full concentration.



Biodiesel Planning Matrix

Issues:	Warranty	Cold Flow	Air Settings	Seal Material	motivation to provide equipment needed	Long Term Storage	Technician Acceptance	Supply	Products UL approved for this application	Cad Cell and Flame Proving	Truck hoses	Meters	Btu Content	Tank Issues with Pre-existing Sludge
Biodiesel %														
5	I	A	A	A	A	A	A	A	A	A	A	A	A	A
20	I	M Manageable with Petroleum and Additives. Development of new feedstocks?	A	A Should be fine	M	A	M	A	I	A	A	A	A	M
50	I	I May need tank Heater, or Indoor Only. Mangement of terminal storage, blending, trucks	M May need adjustment	I Nitrile? New vs degraded fuels. Role of the equipment manufacturers?	I	I Additives, Improved practices and tools for management of fuel quality. Communication?	I	U	I	M	U	U	M Communication ?	M
100	I	U May need tank Heater, or Indoor Only. Management of terminal storage, trucks	M Will need adjustment	I Nitrile? New vs degraded fuels. Role of the equipment manufacturers?	I	I Additives, Improved practices and tools for management of fuel quality. Communication?	I	U	I	M Air adjustments should resolve	U	U	M Communication ?	M

Key

A- Not a problem

U-Unknown

I - A key issue

M - Important but not a direct barrier

NBB-Supported Next Steps on Biodiesel

- Task 1. Piston Seal Testing
- Task 2. Combustion Testing with Higher Biodiesel Blend Levels
- Task 3. Topical Reports
- Task 4. Industry Presentations
- Task 5. Higher Blends – Data on Temperature Environment
- Task 6. General Troubleshooting (copper, field problem evaluation)
- Task 7. B50 Demonstration
- Task 8. Evaluation of Pumps for High Blend Levels.



Richard Sweetser
NORA Sr. Advisor on Research
NORA Board of Director's Meeting
May 2019

NORA UPDATE

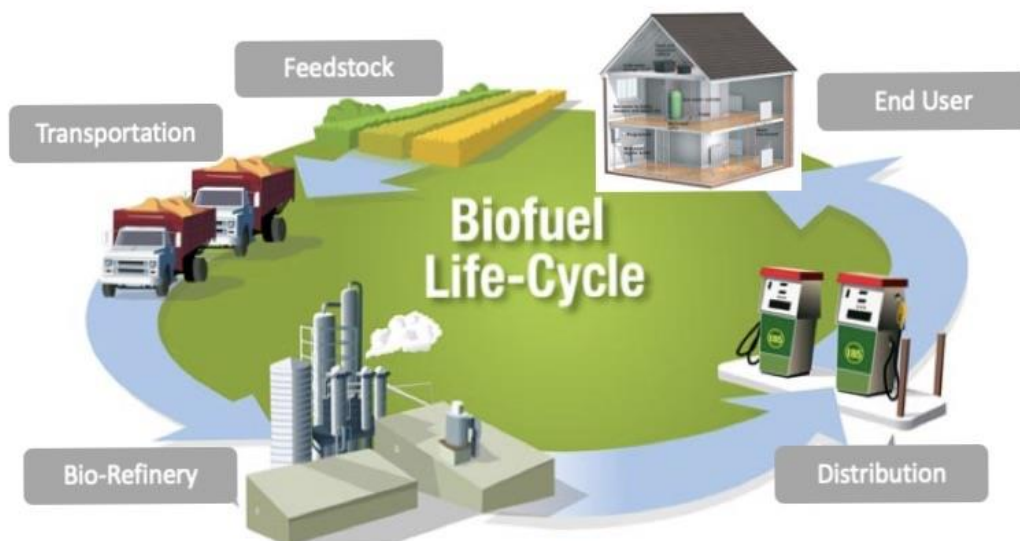
Technical Program Update

B100 Multi-Fuel Burner B50-Compatible Boiler with AMC

Design – Product Development – Testing – Market Commercialization

Project Goal: Integrate a new multi-fuel smart-burner with leading boiler brands to improve traditional Oilheat systems and enable new Bioheat™ solutions

Market Goal: Demonstrate a viable and economic pathway to sustainable home heat that meets large-scale GHG emissions plus accelerate market transition



B100 Multi-Fuel Smart Burner



From Prototype Development to Value-Engineered Pre-Production Design

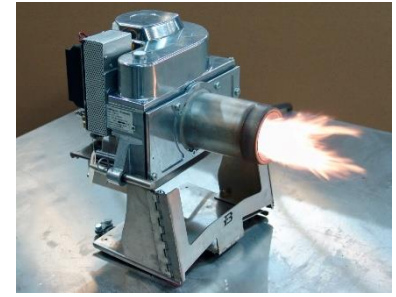
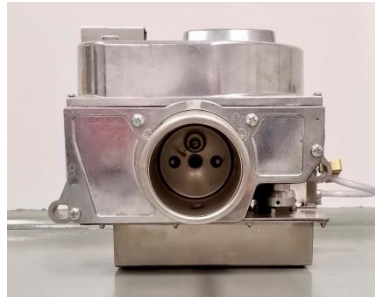
✓ Stage 1:
Value Eng &
Component Eval

✓ Stage 2:
Prototype
Fabrication

✓ Stage 3:
Component Testing

✓ Stage 4:
Performance
& Biofuel Testing

✓ Stage 5:
Commercialization
& Planning



B100 Multi-Fuel Smart Burner



Development Goal: Combine proven multi-fuel burner technology with intelligent control to improve existing heating systems and make them 100% Biodiesel compatible.



Value-Engineered FlexFire 75 MFB (Pre-Production Design)

Standard Features	
Easily Adjustable	Fixed Firing Rate 0.38 – 0.85 GPH (phase 1)
High-Efficiency Performance	Ultra-clean combustion, no smoke or CO
True Multi-Fuel Compatibility	No. 2 oil up to B100 without parts change
Optional Features	
Automatic Modulating Firing Rate	Between 0.38 – 0.85 GPH (phase 1)
Self-Tuning via Intelligent Control	Real-time fuel-air adjustments to compensate for changes in desired excess air levels (O ₂ or CO ₂)
Internet of Things (IoT)	Real-time remote monitoring and service troubleshooting w/ trend analytics enables adaptive BioHeat® Solutions

B100 Multi-Fuel Smart Burner



Commercialization Update: Commercialization goal remains the same. Replace high-pressure burners with biodiesel-ready FlexFire. Key industry partnerships are advancing.

Lab Testing: NORA lab testing is ongoing and to be continued with value-engineered pre-production burner. UL listing underway to be available for fall field trial units.

Field Trials: Bioheat® home field trials scheduled for 2019-2020 winter season w/ industry partners. 2018-2019 field trial slipped due to newly added product features and advances.

New Features & Capabilities: self-tuning via closed-loop control with O₂ sensor to modulate air-to-fuel ratio (AFR) to optimize fuel efficiency – no matter the fuel or conditions. B100 proof of flame (POF), added communication capability from burner to computer for remote monitoring, integration testing in variety of boilers and furnaces.



B50 Compatible Boiler with AMC



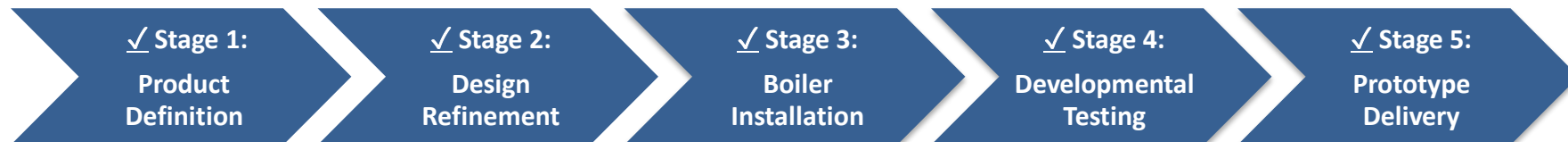
Development Goal: Convert multiple boiler brands to B50+ compatible heating systems by integrating the FlexFire MFB, with minimal upgrade required to the appliance – and make it *Smart*.

Market Goal: Enhance traditional Oilheat – and enable new Bioheat®.

Key Features: The FlexFire is the first intelligent multi-fuel burner that monitors itself while firing into the appliance. If conditions change inside or outside the home, the burner adjusts itself to maintain optimum combustion performance and efficiency. If the burner strays outside of its operating range, then it will alert an oilheat technician via text with a SmartAlert for troubleshooting procedures.



B50 Compatible Boiler with AMC



A Continuous Innovation with Disruptive Qualities:

Our primary objective was to create a series of program control curves (maps) that would produce:

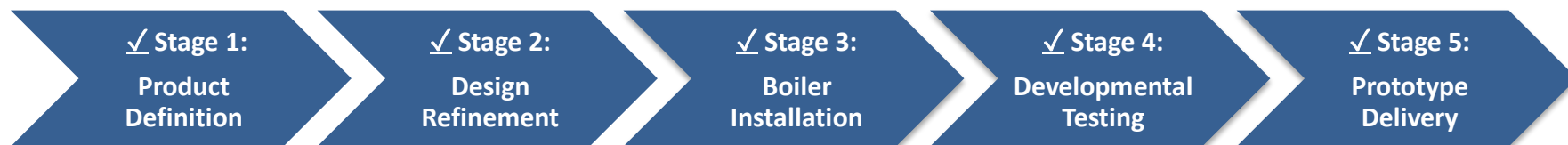
- A user desired exhaust stack excess air (oxygen) level
- Across a wide range of firing rates
- Using fuel blends from No. 2 diesel (B0) to B100

Additional Objectives Included:

- Confirm easy burner installation and fit
- Integration of burner with boiler control system
- Real-time data capture and logging for interactive programming and online management



B50 Compatible Boiler with AMC



Sixteen (16) Different Burner Configurations: Have been tested in 6 different heating appliances in 384 separate fired tests:

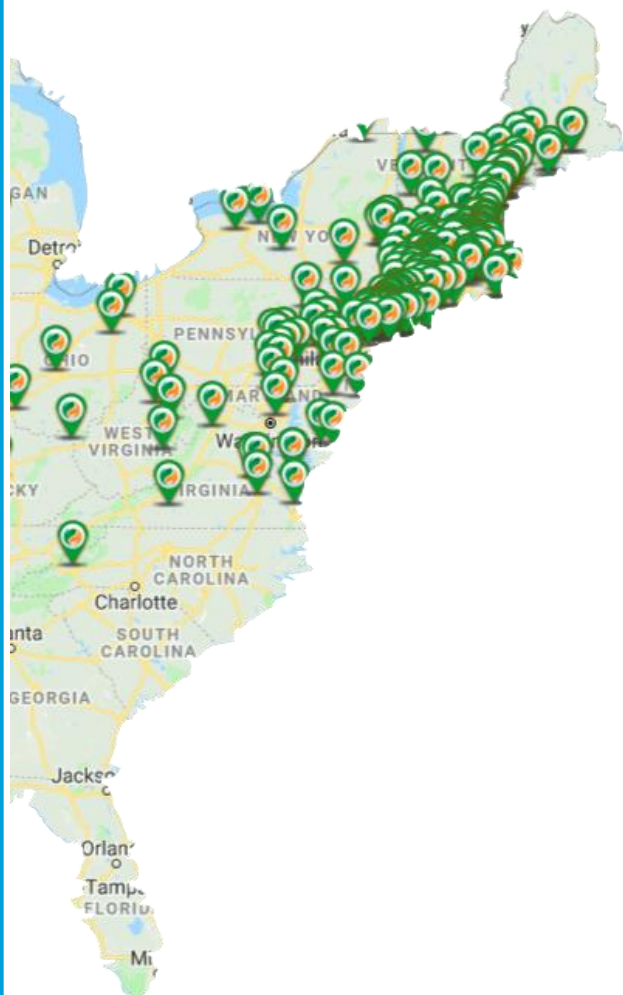
- Slant/Fin Intrepid TR-209
- EK System 2000 (90+ Resolute) & EK1 Frontier
- Peerless WBV 03-WPCL
- Granby non-condensing furnace KHM-100
- Granby condensing furnace KLC-100

Hardware Evolution: Various burner configs have been tested over time due to:

- Improvements made for manufacturability
- Biodiesel upgrades to hardware components
- Software and hardware control upgrades



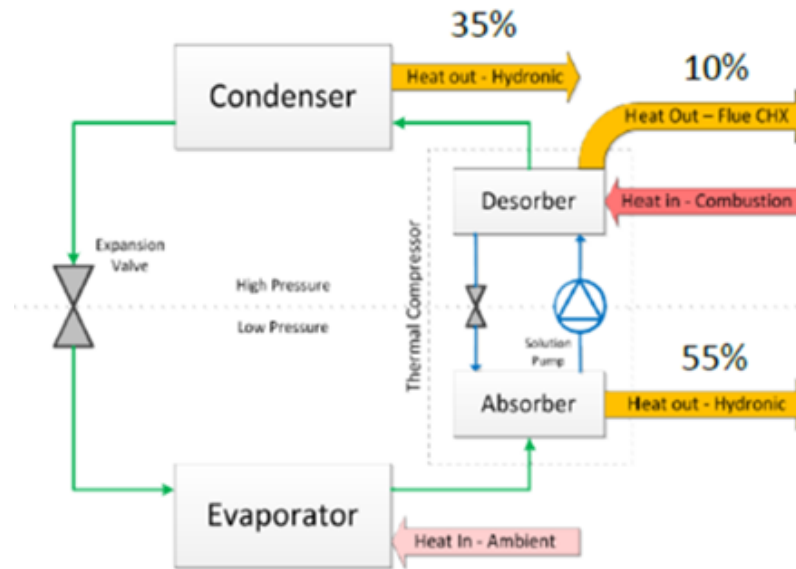
B100 Multi-Fuel Smart Burner



Commercialization and Sales Plan Highlights:

- Product launch and market introduction scheduled for 2020
- Industry partner discussions are advancing
- New aluminum die-cast housing allows for any number of early-market production burners to be built
- Babington Burner Company (BBC) formally spun-off from Babington Technology (parent company)
- BBC website has been launched
- Winter field trials to begin with Bioheat® partners in 2019 leading to pre-sales to targeted early customers
- Winter field trials designed to a) prove market application and b) quantify a clean energy economic model for oil marketers
- ETL / UL certification of new FlexFire model is in process and targeted for Q4 2019
- ETL / UL timing to cover both No. 2 and B100
- Early sales projections show exponential 10-yr biodiesel growth
- Sales plan to target Bioheat® early adopters clustered in NY and Boston Metro region ... expanded to Connecticut

Stone Mountain Technology Inc



Absorption Cycle

NYSERDA Liquid Fuel AHP Proof of Concept Test



Advanced Renewably Fueled Heat Pump

This project modifies the burner design to operate with blends of biodiesel and ethyl levulinate (an advanced cellulosic biofuel). No fossil fuels will be needed. Combustion feasibility testing will be conducted at the NORA Planview, NY laboratory. One existing liquid fueled heat-pump prototype will be used and tested in an environment chamber for proof of concept and also tested in actual operating conditions through one winter at the SMTI laboratory.



Stone Mountain

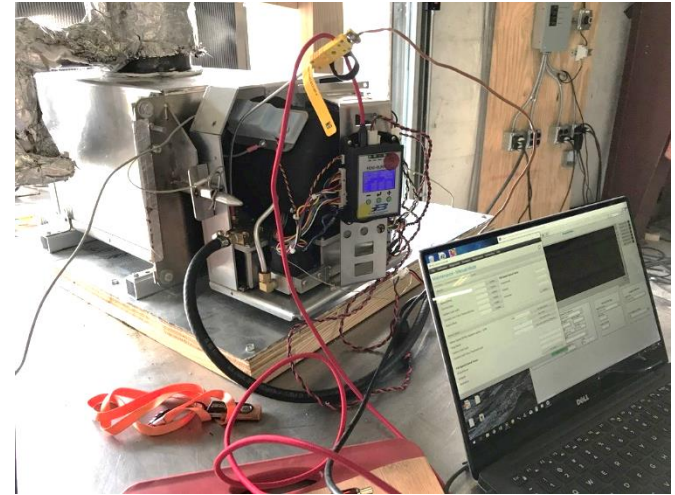


Stone Mountain Liquid Fuel AHP



Current Development:

- Initial bench-test feasibility proved successful
- Increase upper limit of fuel firing rate
 - a slight increase for No. 2 oil
 - a significant increase for biodiesel
- Increase static pressure capability of the blower
 - increase blower RPM
 - Add an inducer fan at the end of the condenser
 - add a blower upstream of the present blower
 - replace current blower with a different larger blower

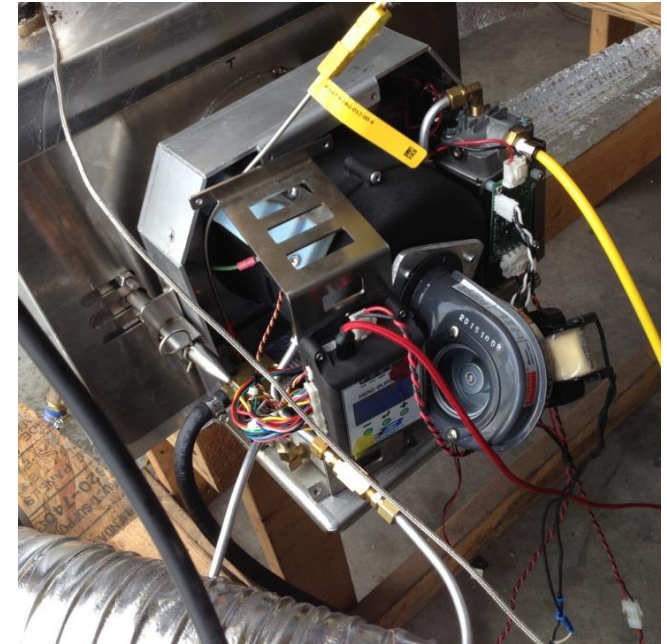


Stone Mountain Liquid Fuel AHP



Technical Challenges and Current Testing :

- Using the same FlexFire burner configuration designed for a negative-pressure home heating appliance has presented challenges
- As it is operating in the very high-pressure environment of the Liquid Fuel AHP (originally designed for gas input).
- The excessive back pressure has created overheating of fuel in the sump plus unstable combustion
- However, the increased static pressure of the Value-Engineered FlexFire design may prove feasible – and is being tested with a new blower motor and an inducer fan configuration



Future Research



Modular supply of heat

- Integration in any existing heating system
- Universal use thanks to modular add-ons
- Prepared connections for DHW and heating circuits on the buffer vessel
- Connected using plug & play

Dachs

Electric output:	5.0 – 5.5 kW ⁽¹⁾
Thermal output:	11.7 – 14.8 kW ⁽¹⁾
Fuel ⁽²⁾ :	Natural gas, LPG Fuel oil, RME





NORA Board Meeting 2019 Education Report

JOEL DELGADO

Tech ID: 6230delg
Email: jdelg162@yahoo.com
State: N/A
City: N/A

Current Certificate

Silver

Start date: 07/13/15

Expiration date: 12/31/20

Current CEUs for Recertification

16.00

Online Courses

Earn CEUs
online



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Silver Certification Review



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Online CEU Classes

- 2,395 online classes completed in the past year.
- 105 people have enrolled in the Gold Hydronics class, 31 have completed it.
- We continue to work with manufacturers to add more topics.

**HYDROLEVEL
COMPANY**

 **ENERGY
KINETICS**

 **Taco**

Beckett

 **Honeywell**
Carlin™
Combustion Technology, Inc.

Tigerholm

NORA Education
NATIONAL OILHEAT RESEARCH ALLIANCE

Online Testing

- Vast majority of current tests.
- Computer labs @ schools.
- Keeps them honest.
- Faster, simpler grading.



Remote Certification Testing

- Available for areas where classes and proctors are unavailable.
- Offered on a case by case basis.



Bronze & Silver Programs

Meeting with John Huber & Bob O'Brien in June to review both programs & the Technician's Manual.



Gold Program

- Working with STI on final edits of Tank Manual.
- Work with associations to increase scheduling.
- Recognize additional alternatives.
(Peerless, Taco & BPI)
- Expand topics – Combustion.....