

# Overview of the NORA Research Agenda

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National Oilheat Research Alliance

Technical Workshop  
Sept. 14, 2016



# Overall Goals

Technical research to strengthen the industry

Developing Next-Generation Technologies

Energy Efficiency

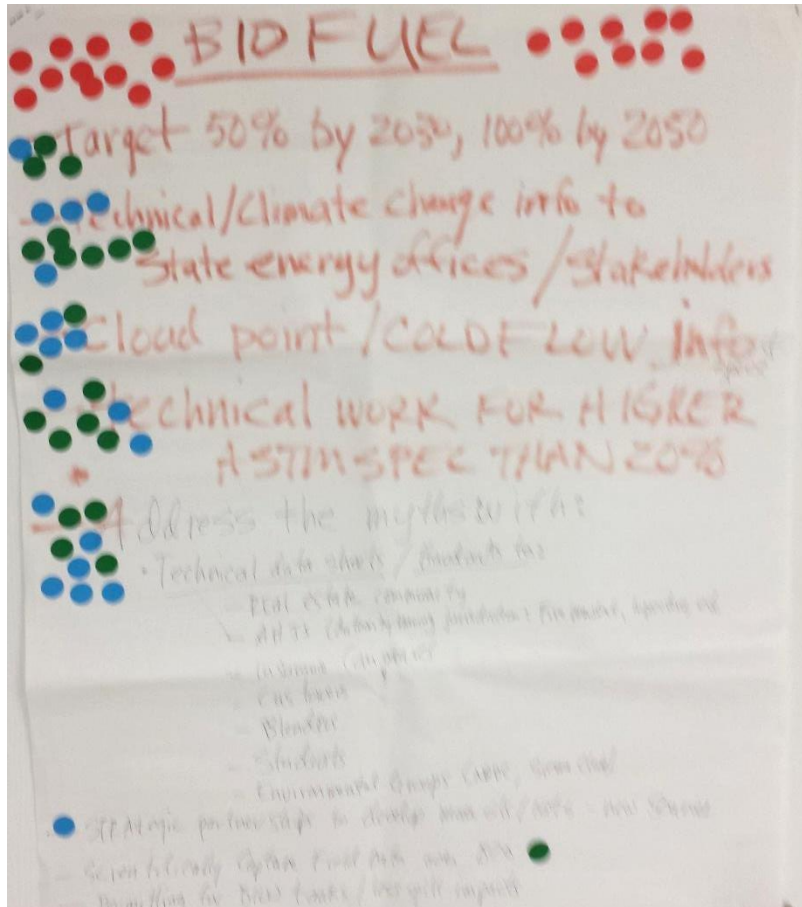
Increased renewables integration

Fuel storage, safety, and quality

Improved efficiency of service

Improved reliability

# June 3-4, 2014 Research Summit





# Research Topic Prioritization

Priority	Research Topic	Percentage of Votes
1	Biofuels	27%
2	Field Demonstration / Documentation	19%
3	Low Cost / High Efficiency Appliances	18%
4	Controls and Emerging Technologies	14%
5	Combustion / Advanced Burners	11%
6	Fuel Quality	11%

# Research Program Opportunity Notices (PON)

NORA 2014-001 Product Development PON Page 1



**Product Development**  
**Program Opportunity Notice (PON) No. 2014-001**  
**October 31, 2014**

**\$2,000,000 Available in this Round of Funding**  
**Proposals are due December 12, 2014 at 5:00 PM Eastern Time**

The National Oilheat Research Alliance Board of Directors will authorize \$2,000,000 to be spent on the following project areas under the direction of the National Oilheat Research Institute (NORI) during the next four years. Successful research, development and demonstrations grants in the past ranged from \$20,000 to \$350,000. All projects will be managed by NORA's Liquid Fuels Research Center (LFRC).

NORI PON No. 2014-001 seeks proposals to support the development, demonstration, and commercialization of Oilheat technologies and systems in the following categories:

**Category A: Fuel use/tracking**  
**Category B: Combustion monitoring**  
**Category C: Fuel Quality Assessment**  
**Category D: B-100 burner**  
**Category E: Smart meter technology**  
**Category F: Atomization technology**  
**Category G: Other New Ideas**

Under PON No. 2014-001, NORI plans to award multiple cost-shared contracts in Categories A through G up to a total of \$350,000 for each award. This funding allocation may be adjusted depending on the quantity and quality of proposals received. There is no minimum project funding amount per project award.

This solicitation includes the following:

- Category A: Fuel use/tracking**
- Category B: Combustion monitoring**
- Category C: Fuel Quality Assessment**
- Category D: B-100 burner**
- Category E: Smart meter technology**
- Category F: Atomization technology**
- Category G: Other New Ideas**

# Combustion Lab Overview

- Three test bays for research, three for training;
- Shared venting, fuel supply, hydronic heat dump;
- Hydronic loop to air handler – heat discharge to outdoors;
- Installation by Technical Heating – Bob O’Brien
- Designed for functionality, flexibility, and presentation;
- Flue gas – emissions analysis
  - CO<sub>2</sub>, NO<sub>x</sub>, CO
  - High-end, rack-mounted NDIR
- Data Acquisition and Control
  - National Instruments DAQ
  - Labview Platform
  - Temperatures, fuel and water flow, flue gas composition
- One boiler currently installed
- Quartz combustion chamber work in progress



## NORA Internal R&D Projects

- Technical Workshop
- Biodiesel Use Survey
- Fuel Quality Field Study
- Pump Piston Field Evaluation
- Pump Piston Lifetime Testing
- Cad Cell Testing
- Tankless Coil Boiler Best Practices Guide (with NYSERDA)
- Mini-split integration (with NYSERDA)
- NORA Participation on NESCAUM-led Technical Support Team to NYSERDA
- Idle Loss Test Procedure
- Additional Test Data for FSA
- Biofine Fuel Data Development
- Plainview Lab Outfitting

# Workshop Presentations that are Part of NORA R&D Program

- Advancements in Self-Modulating, Biodiesel-Compatible Burners, Babington Technology, Inc.
- Fuel-oil conversion for gas burners, Novatio Engineering
- Results of Marketer Use Survey, NORA
- Field Fuel Quality Study, NORA
- A Review of Lab Experience with Biodiesel Blends, T. Butcher
- The Science Behind the Updated FSA, Roger Marran and T. Butcher
- Advanced Venting Opens the Door to Compete with Condensing Gas Technology, Energy Kinetics, Inc
- High Efficiency Tankless Coil Boilers and Mini-split Integration, NORA
- Thermal Heat Pump Technology – the Future Beyond 100%? Richard Sweetser



# Goals for the Workshop

- Share information about new technologies and directions;
- Identify new research ideas, opportunities, and collaborations