



Product Development

Program Opportunity Notice (PON) No. 2019 Dated: June 14, 2019

Proposals are due August 1, 2019 at 5:00 PM Eastern Time

Introduction

The National Oilheat Research Alliance Board of Directors has authorized funds to be spent on the project areas listed below. Successful research, development and demonstrations grants in the past ranged from \$20,000 to \$350,000. Under PON No. 2019, NORA plans to award multiple cost-shared contracts in Categories A through I 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.

Background

The heating oil industry is facing a new challenge that must be addressed. State and local governments in oil heat regions are developing policies to achieve long term reductions in greenhouse gas emissions (GHG). Most northeastern states have a plan and some already have been codified into law. Generally, the plans commit to reductions of greenhouse gases of 50% by 2030 and 80% reductions by 2050, some even call for 100 % reductions. These policies include the elimination of heating with oil. One very popular approach to achieve this is converting building heating to electric cold climate heat pumps, powered by the future renewable electric grid (wind, water and solar with battery storage). If the heating oil industry is to remain part of the heating market of the future, it must develop advanced biofuel solutions now, and transition to the “renewable liquid fuels” industry.

National Oilheat Research Alliance (NORA) research demonstrates that high biodiesel blends (greater than 20%) are operating very well in the field although most oil burners are rated by the manufacturer to burn a maximum of 5%. While other biofuels are under development, biodiesel is the only renewable fuel available now in sufficient quantities to make a difference in the market. Currently, it is common for biodiesel to be blended into home heating oil and it is becoming increasingly difficult to find homes heating with oil which have no biodiesel. Renewable Diesel (RD) is a low carbon biofuel that could offer solutions in the future. However, RD costs significantly more than biodiesel in today’s market. RD’s price is currently driven by the California transportation market. It is clear that RD capacity will be easily absorbed by the transportation market for the foreseeable future and unlikely to be available for home heating. Also, RD has no ASTM specification and production processes are not the same. RD fuels have not been fully evaluated for compatibility with elastomers commonly used in fuel systems. Currently,

there is active R&D on RD in Europe and NORA is monitoring this work. NORA continues to research other biofuels, like ethyl levulinate which converts cellulosic waste into a fuel that may have potential for the future.

Technical Planning Workshop



NORA held a Technical Planning Workshop, April 3 & 4, 2019 in Melville, NY, to outline appropriate research to be undertaken to address the challenges of the future. One topic which received great attention is a move from low blends of biodiesel (5 to 20%) to 50% renewable biofuel by 2030 and 100% zero carbon biofuel by 2050. Close to 60 industry members, including heating oil retailers, equipment manufacturers, association executives and NORA staff participated in the workshop, the Alliance reported in an email to the industry: “The first day focused on assessing the competitive environment for home heating. In particular, there was extended discussion on the increasing emphasis in states and regional organizations to dramatically reduce atmospheric carbon emissions.

The result of the Technical Workshop was a prioritized series of research topics that NORA should pursue in the near-term in order for the industry to achieve its 2030 and 2050 renewable fuel goals. Some of these topics will be undertaken by NORA’s Research Center. The remaining research topics are the subject of this Program Opportunity Notice.

NORA PON No. 2019 seeks proposals to support the development, demonstration, and commercialization of Oilheat technologies and systems in the following categories:

A	Ability to go to 100% a low carbon liquid fuel (LCLF) – biodiesel, cellulosic or another advanced biofuel, and blends thereof (LCLF). Seeking fuels, components, and burners for NORA testing and ultimate commercialization.
B	Research topics covering biofuel blending, marketer terminal storage, delivery and onsite storage
C	Develop modeling and a report that demonstrates that LCLF appliances can be a better solution than electric heat pumps for residential heating and domestic hot water (comfort, economics, carbon reduction, resilience and grid relief)
D	Analyze and report on the 2030 and 2050 biofuel supply and delivery infrastructure to the

	Pacific NW, Upper Midwest, Mid-Atlantic and New England regions versus the potential renewable liquid fuel demand assuming B50 by 2030 and B100 by 2050.
E	Demonstrate and field test integration of the latest generation of smart thermostats with boiler applications.
F	Demonstrate and field test self-diagnostic burners and or appliances that provide trend analysis, component approaching failure and troubleshooting failure analysis.
G	Develop an analytical economic optimization model and report covering the sizing and operation of adding a cold climate heat pump to a non-condensing boiler providing radiant heating and DHW, as well as a condensing boiler providing radiant floor heating and DHW.
H	Develop advanced heating technologies including LCLF heat pumps focusing on efficiency and zero net carbon
I	Develop off-grid or grid failure heating systems that can operate in absence of power using batteries or generators or other means

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Logistics

Proposal Checklist Attachment A

Sample Contract Pricing Proposal Form and Instructions Attachment B

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A webinar will be held on June 21, 2016 at 2 PM EST. There will be a short discussion on the basic elements of the PON and then NORA will entertain any questions from the Webinar participants.

Webinar Address:

<https://zoom.us/j/7037070293>

Dial by your location

+1 929 205 6099 US (New York)

+1 669 900 6833 US (San Jose)

Meeting ID: 703 707 0293

Proposers are strongly encouraged to contact NORA to discuss their planned proposals after the above conference call and prior to submission if questions remain unanswered. If you have any questions about program issues or the technical scope of this solicitation, please contact one of the following individuals by e-mail, facsimile or calling:

To: Richard Sweetser; Director R&D	cc: John Huber; President
Phone: 703.707.0293	Phone: 703.340.1660
Fax: 703.707.9566	Fax: 703.340.1661
E-mail: rsweetser@exergypartners.com	E-mail: jhuber@noraweb.org

Proposals must be sent by email in a PDF to jhuber@noraweb.org or posted on a secure website for download by NORA. Late proposals, and proposals lacking the appropriate completed and signed Proposal Checklist, will be returned. Proposals will not be accepted at any other location, other than specified above. If changes are made to this solicitation, notification will be posted on NORA's web site at www.noraweb.org

NOTE: Categories B, C and D are not subject to cost share.

Applications will be evaluated by NORA's research and development committee and outside technical/financial experts, with funding decisions expected approximately six weeks after the proposal due date. The review will involve a comparative evaluation of the criteria in Appendix C.

PROGRAM INTEREST AREAS

CATEGORY A - Ability to go to 100% a low carbon liquid fuel – biodiesel, cellulosic or another advanced biofuel, and blends thereof (LCLF). Seeking fuels, components, and burners for NORA Testing.

Test Renewable Fuels

In this task, NORA is seeking sources of new renewable fuels, to expand beyond standard biodiesel and renewable diesel that have the potential to deliver sufficient quantities to contribute to the industry's goal of a 50% home heating liquid renewable fuel supply by 2030. Use the latest EIA heating oil sales data¹ in the table below as the base case. NORA is seeking quotes for renewable test fuels to be supplied to the NORA Research Laboratory in Plainview, NY in a minimum quantity of 55 gallons for testing purposes.

Sector	Gallons
Residential Consumers	2,986,203,000
Commercial Consumers	2,068,810,000
Industrial Consumers	1,765,815,000

Test Renewable Fueled Burners

In this task, NORA is seeking sources of new B100 burners and burner system components for residential combustion of 100% biodiesel. In this task, NORA will support late stage development of a burner and its components provided a minimum of five prototype burners can be provided to the NORA Research Laboratory in Plainview, NY by December 31, 2019.

CATEGORY B - Research topics covering biofuel blending, marketer terminal storage and delivery.

NORA is seeking research projects regarding biodiesel blends of B50 and B100. The following topic areas of interest assuming outdoor storage in low ambient (20F, 0F -20F):

1. Demonstration of cold flow property management with petroleum and additives.
2. Identification of new feedstocks which could improve cold flow properties of biodiesel.
3. Design of terminal storage, blending, trucks to accommodate high biodiesel blends.
4. Testing of additives to improve long term storage.

¹ <https://www.eia.gov/petroleum/fueloilkerosene/>

CATEGORY C - Develop modeling and a report that demonstrates that LCLF appliances can be a better solution than electric heat pumps for residential heating and domestic hot water (comfort, economics, carbon reduction, resilience and grid relief).

This task requires full life cycle costing, performance and emissions of supplying residential heating and domestic hot water to a 2,500 square foot house using located in the Northeast, Midwest and Western census regions. The analysis should examine today as a base case, 2030 and 2050. Assume the electric grid will reduce GHG emission 40% by 2030 and 80% by 2050. Assume heating oil will be at B50 by 2030 and B100 by 2050. The electric and liquid fuel analysis should be based on:

Electric Heat Pump: This should include today's good² house average cold climate heat pump coupled with an electric resistance and water heater and also a heat pump water heater. The economic analysis should be based on present, 2030 and 2050:

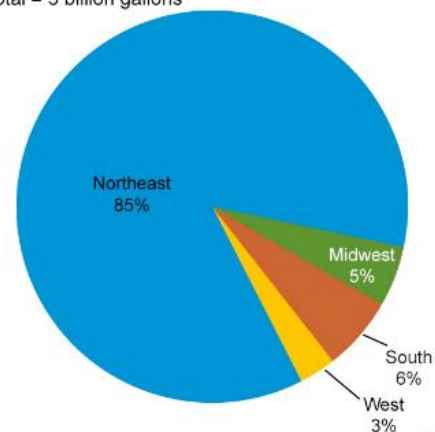
1. Impact of fuel cost
2. Impact of production cost including adding renewable sources
3. Impact of energy storage
4. Impact of increases in transmission especially to low winter PV load factors
5. Impact of increases in transmission
6. Impact of conversion form oil heated home to electric heat pump
7. Impact of operation cost
8. Carbon reduction
9. Resiliency (impact on the electric grid operation)

Liquid fueled boiler and thermal heat pump: This should include a 91% efficient non-condensing boiler, a 96% efficiency condensing boiler and a 1.4 COP thermal heat pump providing heating and DHW into a thermal storage tank. The economic analysis should be based on present, 2030 and 2050:

1. Impact of fuel cost
2. Impact of fuel delivery and storage infrastructure changes to accommodate B50 and B100
3. Impact of operation cost
4. Carbon reduction
5. Resiliency (impact on the electric grid operation)

Sales of residential heating oil by Census region, 2017

Total = 3 billion gallons



Note: Sum of percentages may not equal 100% because of independent rounding.

Source: U.S. Energy Information Administration, *Fuel Oil and Kerosene Sales, Adjusted Sales of Distillate Fuel Oil by End Use*, January 2019

² Fixed appliance efficiency for this analysis

CATEGORY D - Analyze and report on the 2030 and 2050 biofuel supply and delivery infrastructure to the West, Midwest, and New England regions versus the potential renewable liquid fuel demand assuming B50 by 2030 and B100 by 2050.

Using the latest EIA heating oil sales data³ in the table (Category A above) and allocation by census region (see below), as the basis for a base-case consumption analysis for 2030 and 2050 for the residential demand, create an analytical model and report showing the following:

1. availability of biodiesel feedstock
2. current, planned and required future production facilities to meet demand
3. current, planned and required future bulk delivery to the three markets
4. current, planned and required future bulk storage to the three markets
5. sensitivity analysis including plus and minus 10%, 20%, 30% and 40% increments

CATEGORY E - Demonstrate and field test integration of the latest generation of smart thermostats with boiler applications.

Hydronic systems have lagged behind furnace and heat pump systems moving to the use of smart thermostats. Most smart thermostats have been designed for the residential forced-air market and in many cases do not address the differences between forced-air and hydronics. Examples of this include the prevalence of multiple zones, radiant floor heating and the associated time delay to warm up, and the use of outdoor reset within boilers to vary system capacity. Well-designed smart hydronic controls take these needs into consideration and accommodate them fully. Some manufacturers are recognizing the need for smart devices that work with hydronic systems and are designing products to meet that need. Radiant systems take longer to heat up so it can be difficult to set a temperature schedule that gives you the level of comfort you want on time. Companies like Bosch Connected Control (BCC100), Ecobee, Honeywell, Nest, and Uponor) Climate Control Zoning System II) have to some degree have begun to address coupling their smart thermostat to boilers.

This task seeks laboratory of field performance data on successfully operating smart thermostats with liquid fueled boilers. Satisfactory responses to the task include a finished report of prior work, a laboratory test plan proposal and a field test proposal.

CATEGORY F - Demonstrate and field test self-diagnostic burners and or appliances that provide trend analysis, component approaching failure and troubleshooting failure analysis.

This task seeks laboratory of field performance data on successfully operating test self-diagnostic

³ <https://www.eia.gov/petroleum/fueloilkerosene/>

burners and or appliances that provide trend analysis, component approaching failure and troubleshooting failure analysis. Satisfactory responses to the task include a finished report of prior work, a laboratory test plan proposal and a field test proposal.

CATEGORY G - Develop and analytical economic optimization model and report covering the sizing and operation of adding a cold climate heat pump to a non-condensing boiler providing radiant heating and DHW, as well as a condensing boiler providing radiant floor heating and DHW.

Cold climate electric heat pumps are being added to liquid fueled heated homes for a variety of reasons. This task seeks to develop an analytic model and report examining the economic and comfort optimization of the sizing and operation of adding a cold climate heat pump to a non-condensing boiler providing radiant heating and DHW, as well as a condensing boiler providing radiant floor heating and DHW.

CATEGORY H - Develop advanced heating technologies including LCLF heat pumps focusing on efficiency and zero net carbon.

The single-effect absorption heat pump, with a source energy heating COP of 1.4, is the heating appliance which is the focus of this task. NORA has invested in a proof of concept oil version which is successful on the lab scale at present. This thermodynamic cycle uses combustion heat as the primary energy input, enabling it to capture low temperature heat from ambient air and 'pump' it up to a medium temperature to provide space and water heating. Unlike vapor-compression cycle heat pumps, the capacity and COP of absorption heat pumps do not degrade sharply as the ambient decreases, resulting in an excellent cold-climate heating technology and replacement for standard gas and oil-fired furnaces, boilers, and water heaters that have COPs < 1.0. This task seeks to develop a preproduction prototype version designed for B0 to B100 operation or other alternative thermal heat pump technology.

CATEGORY I - Develop off-grid or grid failure heating systems that can operate in absence of power using batteries or generators or other means

This task seeks to develop to approaches to resiliency. The first is to provide heating and DHW through an electric grid outage event. The second, in addition to the first, is to provide a certain amount of electricity for power the home critical needs. In the critical heating case, a grid event duration should be between one week and three weeks.

Critical heating – this task seeks the development of a series of trickle charger, battery backup and grid island kits to supply power to burners and circulators for the event duration.

Standby power - this task seeks the development of 5 kW B50 and B100 standby home generator.

PROGRAM REQUIREMENTS, PROPOSAL FORMAT, PROPOSAL EVALUATION

Project Scope – Proposals must:

- In all cases, proposals must articulate how the proposed work will markedly benefit the industry within the next five years.
- Provide quantifiable energy, environmental, economic, industry and/or consumer benefits.
- Emphasize development of marketable products with market introduction dates within three years.
- Provide a summary discussion of the commercialization path appropriate to the stage of development of the proposed technology. Note that, even in early stage projects, initial projections of commercialization (or technology deployment) paths and challenges are essential to assessing *benefits, risks, and future resource requirements*.
- *Provide cost-sharing by the proposer or third parties:*
 - ◆ *In the form of cash or in-kind labor, materials, equipment, facilities, and other resources, subject to reasonable and verifiable valuation. Cost-sharing may be from the proposer or other private or government sources. NORA's funds cannot be used to reimburse or replace normal expenses of other government organizations.*

Equal to at least 20% of the total project cost. The quality of the proposer's cost-sharing will be examined during the proposal evaluation process. Cash, labor, and materials are considered superior to other types of cost-sharing. The type of cost-sharing offered should be appropriate for the proposer's financial condition and the stage of development of the product/process, i.e., degree of risk. The level of cost-sharing will be considered an indicator of the proposer's commitment to the success of the project. NOTE: Categories B, C and D are not subject to cost share.

Project Schedule, Phasing and Teaming – The following guidelines should be considered when developing proposals:

- Projects are expected to begin within three months of the proposal due date. The project schedule, including future phases (beyond the proposed phase) of a multiphase project, should not exceed 36 months.
- Requirements for Multiphase Projects – Multiphase projects are acceptable as long as the proposal:
 - ◆ Briefly describes all phases along with significant milestones, and provides an estimate of the total cost and schedule for all phases.
 - ◆ Proposers shall only request funding for one clearly-defined phase that adheres to the

funding limit as described above. The proposer must accept that any contract awarded to fund one phase of a multiphase project does not in any way obligate NORA to fund later phases. Funding requests for additional phases may need to be submitted under a future PON for competitive evaluation.

- Teaming arrangements are encouraged, where appropriate, to enhance the likelihood of project success. Teams may include commercial firms, industry associations or research organizations, universities, government agencies, end-users, and other stakeholders. Include letters of interest or commitment from each identified team member in an appendix to the proposal.

Other Requirements:

- A proposal may be considered non-responsive if it fails to comply with the requirements above, the Proposal Format (below), or the General Conditions of Section III.
- Prior to an award being made, potential contractors may be required to demonstrate: access to financial resources sufficient to perform the proposed work; technical experience and adequate facilities (or the ability to access them); a good performance record and; the ability to qualify for an award under applicable laws and regulations.

Proposal Format:

Total proposal length should be 16 pages or less, plus letters of interest or commitment in an appendix. The contract pricing proposal or budget is not included in this page limit. Suggested page limits for each section are provided below in parentheses. Proposals that exceed the page limits may be rejected as non-responsive.

Proposals must be sent by email in a PDF to jhuber@noraweb.org or posted on a secure website for download by NORA.

Each proposal must include the items listed below and should present the items in the sequence indicated.

A. **Proposal Checklist** – Complete and sign the specific Proposal Checklist attached as part of this PON, and include it as the front cover of the original and each copy of the proposal.

Note the following:

- Indicate whether you accept the standard terms and conditions as contained in the attached Sample Agreement. If you do not accept the standard terms and conditions, provide alternate terms with justification based on the risk and benefit to NORA.
- Be sure the individual signing the Proposal Checklist is authorized to commit the proposer's organization to the proposal as submitted.

B. Proposal Sections – Sections of your proposal should be as follows:

1. **Executive Summary** (one page) – Briefly summarize your proposal, emphasizing:

- The problem or opportunity being addressed, and its significance, and its relevance to this PON.
- Your proposed solution and how it will solve the problem or exploit the opportunity.
- A list of the project team members and their qualifications to do the work.
- Benefits if the project is successful. Include an estimate of market potential and quantify the energy, environmental, and economic benefits to the extent possible.
- User economics. Provide an estimate of the price of the product, process or service that eventually will be commercialized and the price(s) of relevant alternative products or services. Briefly explain the customer's economic motivation for buying the new product, process or service, versus alternatives.

2. **Problem Statement and Proposed Solution** (two pages) – Describe:

- The problem or opportunity being addressed, and its significance, and its relevance to this PON.
- Your proposed solution and how it addresses the problem or opportunity, its technical basis, innovative characteristics, and current stage of research and development.
- Economic and performance comparisons to competing technologies.
- If this proposal addresses a subsequent phase of a previously funded NORA project, the results of the earlier phase(s) and current project status.

3. **Proposed Work Scope and Schedule** (three to four pages) – Provide:

- Technical or performance goals for proposed product, process or system.
- A list of major tasks to be accomplished and a three- or four-sentence description of each. Typical task titles may include, but are not limited to, the following: project management and reporting, requirements definition, preliminary design, fabrication, testing, final design, and demonstration. (Note: NORA will expect to receive written progress reports and a final report, and have occasional project meetings, as part of the project management task. These activities should be considered when developing your cost estimates.)
- The duration of the project and timing of major milestones, such as design reviews, test result reviews, completion of working prototypes, and the start of metrics reporting to NORA, showing progress toward project objectives and goals.
- If applicable, a brief description of additional phases, beyond the proposed work, that will be necessary to fully achieve commercialization, and their anticipated duration.

4. **Proposer Qualifications** (two to four pages)

- Proposer and any other team members and major subcontractors. Provide a chart showing the

relationship between team members.

- Project Manager and other key individuals.
- Qualifications of all organizations and individuals named above, including relevant experience and references.
- NORA contracts awarded to the proposer, if any, in the past five years.

5. Project Benefits (two pages) – Outline benefits as follows:

- **Quantify** the following direct benefits to the extent possible:
 - ◆ Energy benefits (e.g.: fuel economy impacts versus alternate technologies);
 - ◆ Environmental benefits (e.g.: emission reductions, elimination of hazardous materials, etc.)
 - ◆ Economic benefits (e.g.: manufacturing jobs or technical services jobs created or retained, life-cycle cost reductions, etc.)
- **Identify** other benefits (e.g.: lowering the cost of compliance with regulations, reducing the probability of equipment failure, etc.)
- **Describe** how the success of the project can be measured or verified, and how and for how long these metrics will be provided to NORA.

6. Commercialization Plan (two pages)

Describe how project results will be commercialized or deployed. Projects nearing a demonstration phase should have a detailed commercialization plan, whereas an early-stage concept should be accompanied by at least a rough outline of how the concept may ultimately be deployed. Cover the following topics:

- **Project Roadmap:** Provide a multi-year timeline (e.g., graph) showing the paths, activities, milestones, resources, and timing to take the technology from its current state of development to commercial deployment.
- **Marketing:** Identify target markets and their characteristics, e.g., size, competition, trends (regulatory, technological, etc.); describe your proposed marketing strategies, explain why they should be successful, and provide sales estimates. Provide an estimate of the price of the product or service that eventually will be commercialized and provide a comparison of that price to competing products or services.
- **Briefly explain** the customer's economic motivation for buying the new product or service, versus alternatives.
- **Design & Production:** Describe remaining technical development steps leading to start of manufacturing or deployment. Describe plans for setting up facilities for manufacturing or other deployment activities. Discuss any key issues such as: need for specialized production equipment or strategic alliances; critical make/buy decisions or cost/volume issues; and, plans for ancillary activities such as service support functions.
- **Finance:** Estimate funds required to go from the current stage of development to a financially

self-sustaining level of commercialization; include funding for R&D and initial marketing and manufacturing/deployment programs. Identify potential funding sources and how those sources will be addressed. Identify any potential strategic partners who could reduce your costs by providing access to marketing/distribution channels, manufacturing facilities or other assets.

- **Organization Plan:** Describe staffing plans for transitioning from R&D stage to commercialization stage; include all organizational functions, such as management, administration, engineering, marketing/sales, and manufacturing.
- **Technology Transfer:** Describe any other actions to promote the new technology, such as the presentation of technical papers.

7. Budget – A Contract Pricing Proposal Form (CPPF), with associated instructions, is provided as an attachment to this PON. A CPPF Excel spreadsheet is available on the NORA website. Each proposal must include a completed CPPF and also a cost-sharing table identifying the allocation of funding by task. Use the following format (expand table as needed):

Cost-Sharing Table:

Funding Source	Task 1 (\$)	Task 2 (\$)	Project Total (\$)
NORA					
Proposer					
Co-Funder(s) (identify)					
Task Total (\$)					

The proposal must show the proposer providing **co-funding of at least 20%** of the total cost of the project. NOTE: Categories B, C and D are not subject to cost share.

This co-funding can be from the proposer, other team members, and other government or private sources. Contributions of direct labor for which the laborer is paid, and purchased materials, may be considered “cash” contributions. Unpaid labor, unbilled labor by employees of government or professional organizations, and overhead expenses are typically offered as “in-kind” contributions.

8. Appendices – Include any resumes, company qualifications, or ancillary information deemed necessary to support your proposal. If appropriate, also include:

Letters of Interest or Commitment – If you are relying on any other organization to do some of the work, provide services or equipment, or share in the non-NORA cost, include a letter from that organization describing their planned participation. Also include letters of interest or commitment from businesses or other organizations critical to the future commercialization, demonstration, or

implementation of the project. Absence of letters of interest or commitment will be interpreted as the proposer not having support from the identified parties.

Proposal Evaluation:

Proposals will be reviewed by the NORA Research Committee selected by the NORA chairman, and will include oil dealers and technical experts and will be scored and ranked according to the following criteria, **listed in order of importance**. After the proposals are reviewed, NORA will issue a letter to each proposer indicating the proposal evaluation results. Proposers receiving favorable evaluations will be invited to enter into contract negotiations with NORA. Such proposers will be required to submit a detailed statement of work, budget, and schedule, and may also be asked to address specific questions or recommendations of the NORA Research Committee before contract award.

GENERAL CONDITIONS

Proprietary Information - Careful consideration should be given before confidential information is submitted to NORA as part of your proposal. Review should include whether it is critical for evaluating a proposal, and whether general, non-confidential information, may be adequate for review purposes.

Contract Award - NORA anticipates making multiple awards under this solicitation. It may award a contract based on initial applications without discussion, or following limited discussion or negotiations. Each offer should be submitted using the most favorable cost and technical terms. NORA may request additional data or material to support applications. NORA will use the Sample Agreement to contract successful proposals. NORA expects to notify proposers in approximately six weeks from the proposal due date whether your proposal has been selected to receive an award or will require further consideration.

Limitation - This solicitation does not commit NORA to award a contract, pay any costs incurred in preparing a proposal, or to procure or contract for services or supplies. NORA reserves the right to accept or reject any or all proposals received, to negotiate with all qualified sources, or to cancel in part or in its entirety the solicitation when it is in NORA's best interest.

Disclosure Requirement - The proposer shall disclose any indictment for any alleged felony, or any conviction for a felony within the past five years, under the laws of the United States or any state or territory of the United States, and shall describe circumstances for each. When a proposer is an association, partnership, corporation, or other organization, this disclosure requirement includes the organization and its officers, partners, and directors or members of any similarly governing body. If an indictment or conviction should come to the attention of NORA after the award of a contract, NORA may exercise its stop-work right pending further investigation, or terminate the agreement; the contractor may be subject to penalties for violation of any law which may apply in the particular circumstances. Proposers must also disclose if they have ever been debarred or suspended by any agency of the U.S. Government, State or local jurisdiction.

Attachments

Attachment A - Proposal Checklist

Attachment B - Sample Contract Pricing Proposal Form and Instructions

Attachment C - Evaluation Criteria in Order of Importance

Attachment A: PROPOSAL CHECKLIST

Proposal Title		Due Date	
Primary Contact (Prime Contractor)		Title	
Company		Phone	Fax
Address	City	State or Province	Zip
e-mail address			
Secondary Contact		Title	
Company		Phone	Fax
Address	City	State or Province	Zip
e-mail address			
The prime contractor must sign this form below.			
THE PRIME CONTRACTOR MUST ANSWER THE FOLLOWING QUESTIONS:			
Do you accept all Terms & Conditions in the Sample Agreement? (if no, explain on separate pg) __ Yes __ No			
Have you been indicted/convicted for a felony within the past 5 years? (if yes, explain on separate pg) __ Yes __ No			
Are you submitting the required number of copies? (See proposal instructions.) __ Yes __ No			
Is other public funding pending/awarded on this and/or very-similar topic (prior and/or competing proposals)? __ Yes __ No (if yes, explain on separate page)			
Have you retained, employed, or designated any person or organization to attempt to influence the procurement process with respect to this solicitation? __ Yes __ No			
ON WHAT PAGE IN YOUR PROPOSAL CAN THESE ITEMS BE FOUND?			
Executive Summary ____		Commercialization Plan ____	
Problem Statement and Proposed Solution ____		Cost-Sharing Chart ____	
Proposed Statement of Work and Schedule ____		Exceptions to Terms & Conditions (if applicable) ____	
Proposer Qualifications ____		Completed and Signed Contract Pricing Proposal Form(s) ____	
Project Benefits ____		Letters of commitment from all participating organizations ____	
AUTHORIZED SIGNATURE			
I certify that the above information is accurate, and that the proposal requirements noted have been completed and are enclosed. I understand that this proposal may be disqualified if the solicitation requirements are not met. I the undersigned am authorized to commit my organization to this proposal.			
Signature		Name	
Title		Organization	
Phone		Date	

NOTE: This completed form **MUST** be attached to the front of all copies of your proposal.

Attachment B: Contract Pricing Proposal Form

National Oilheat Research Institute			PON No. / Category	Page	
Contractor:			Name of Proposed Project:		
Address:					
Location (where work is to be performed):			NORA funding:		
			Total Project Cost:		
Cost Element			Total Project Cost	NORA Funding Requested	Costsharing & Other Co-funding
1. Direct Materials					
a. Purchased Parts					
b. Other					
Total Direct Materials					
2. Materials Overhead					
Rate:					
3. Direct Labor (specify names/titles)		Hours	Rate/hr		
Total Direct Labor					
4. Labor Overhead		Rate %	\$ Base		
Total Labor Overhead					
5. Outside Special Testing					
6. Equipment					
7. Travel					
8. Other Direct Costs					
9. Subcontractors/Consultants					
Total Subcontractors/Consultants					
10. General & Administrative Expense		Rate %	Element(s)		
11. Total Estimated Project Cost					
This proposal reflects our best estimates as of this date, in accordance with the instructions to proposers.					
Typed Name and Title:			Signature:		Date:

Has any executive agency of the U.S. government performed any review of your records in connection with any prime contract or subcontract within the past twelve months? ____ Yes ____ No If yes, identify:

Instructions for Preparation of Cost Estimate

Your cost proposal may be the basis of contract negotiation; it should be specific and complete in every detail. Supporting schedules (as described in Section B) providing the basis for your estimates must be provided.

A. GENERAL

The schedule must be submitted on NORA's Contract Pricing Proposal Form.

B. INSTRUCTIONS AND DESCRIPTION OF REQUIRED SUPPORT DETAIL

(Title each supporting schedule and cross-reference it to the item number on the Contract Pricing Proposal Form)

1a. DIRECT MATERIALS - PURCHASED PARTS

Provide the following information for each proposed item with an estimated unit cost in excess of \$5,000.

- Description of item
- Proposed vendor
- Quantity needed
- Unit cost
- Basis for cost (i.e., catalog, prior purchase, quote, etc.)
- Total cost
- Evidence of a competitive selection process

1b. OTHER DIRECT MATERIALS

For all items in excess of \$5,000, provide whatever information would be necessary to understand what is being obtained, how it is being obtained, what it will cost and how the estimated cost was determined with justification for all items.

2. MATERIALS OVERHEAD (also applicable to other Indirect Rate categories:

3. DIRECT LABOR

a. Commercial Enterprises

(1) Attach supporting schedules showing:

- Each category or type of labor being estimated
- Applicable labor rates per hour (straight-time)

(2) Explain the method used for computing the rates (i.e., actual of an individual, actual average of a category or other grouping, etc.) Also identify any proposed labor escalation and the bases for it.

b. Educational Institutions

Provide the following for each calendar year of the contract:

- (1) For individuals not on an "actual hours worked" basis:
- individual's name

- annual salary and the period for which the salary is applicable (preferably in weeks)
 - the proportionate time to be charged to this effort.
- (2) For individuals who maintain time records as the basis for charging costs, supply the detail as requested in Instructions 3(a)(1)
4. LABOR OVERHEAD (Same as Instructions for 2. MATERIALS OVERHEAD)
 5. OUTSIDE SPECIAL TESTING
 - a. Describe the effort.
 - b. Provide the units of time (hours, days, weeks), cost rates, and the vendor.
 - c. In accordance with the requirements of Section 5.02 of the attached Sample Agreement, provide the basis for selection of the vendor. Explain and justify the basis for any non-competitive selection.
 6. EQUIPMENT

Capability to perform the work with existing facilities and equipment is assumed. It is NORA's policy not to compensate for general purpose facilities or equipment. If some special purpose items are needed solely for this contract and are not available by other means (contractor assets, lease, etc.), then provide the following information for each item of required equipment.

 - vendor
 - model number
 - quantity
 - competitive selection process
 - unit cost and source of cost/price (i.e., quote, catalog, purchase history)
 - description of the use or application (NORA dedicated, contract dedicated, other)
 7. TRAVEL
 - a. NORA will accept as a direct charge only that travel required to perform the statement of work.
 - b. Attach a schedule indicating the need for the proposed travel, the estimated number of person-trips required, destinations, mode and cost of transportation, and number of days subsistence per trip for each destination.
 - c. Identify and support any other special transportation costs required in the performance of this project.
 8. OTHER DIRECT COSTS
 - a. Identify the type of cost (i.e. postage, telephone, publications, graphics, etc.)
 - b. Provide cost details for the amounts estimated (hours or units, rates, etc.)
 - c. For computer costs identify the make, model and type of computer, hours of service and appropriate rates, and whether the machine is company owned or leased.
 9. SUBCONTRACTORS/CONSULTANTS
 - a. Explain the specific technical area in which such service is to be used and identify the contemplated consultants.
 - b. State the number of days and the hours per day of such service estimated to be required and

the consultant's quoted rate per day. Document when/where the consultant has received the proposed rate in performing similar services for others.

10. GENERAL & ADMINISTRATIVE (G&A) EXPENSE (Same as instructions for 2. MATERIALS OVERHEAD)

- If Government-approved indirect rates are proposed, then supply a copy of an appropriate Government document verifying those rates.
- If Government-approved rates are not proposed, supply the following, unless previously provided, for the years comprising the proposed period of contract performance.
- A description (chart or other) of the organization of the indirect cost center.
- The budget of indirect costs, by account, for each proposed indirect expense rate.
- The budget for the base, for each proposed rate, (direct labor dollars, hours, costs, etc.) itemized as to contract hours or costs, research and development hours of costs, and any other direct base effort.
- Actual incurred rates for the prior three years, including actual base and pool amounts.

Attachment C - Evaluation Criteria in Order of Importance

1. Industry Impact (40%)

- How significant is the problem or opportunity?
- Is the proposed project likely to solve the problem or exploit the opportunity?
- Is the proposed work technically feasible, innovative, and superior to alternatives?
- Is the work strategy sound?

2. Project Risk (20%)

- Will the project result in a product, standard or process that will be on the market within three years?
- List key issues to be overcome.
- What is the likelihood of success?
- What is the likelihood of success within the project timeframe?

3. Proposer(s) (20%)

- To what degree does the team have relevant and necessary technical and business background and experience?
- How firm are the commitments and support from essential participants, co-funders, and related businesses and other organizations?

4. Project Outcome/Commercialization Strategy and Cost (20%)

- Is the overall project cost justified based on the expected benefits?
- Relative to the project cost, how significant is the potential market or deployment opportunity?
- Is the implementation or commercialization strategy well-conceived and appropriate for the stage of development?
- How appropriate are the proposer's co-funding contributions (sources and amounts) with respect to the degree of risk, potential to benefit from the work, and financial status of the organization?

Other Considerations – Proposals will be reviewed to determine if they reflect NORA's overall objectives, including: risk/reward relationships, similar ongoing or completed projects, the general distribution of NORA projects among the Oilheat industry and other organizations.